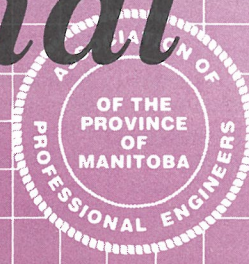


Professional Engineer



August, 1988

Ribbon Cutting At Old Pinawa



"Cutting the Ribbon" — Chairman Len Bateman and Mrs. Margaret Carter, Manitoba Historical Society.

by W. McKay, P.Eng.

On Friday, June 17th, 1988, members of the Old Pinawa Committee, met at the historic hydro-electric structure to mark the installation of a plaque erected by the Association. Those in attendance were: Committee Chairman Len Bateman, Committee Members — Bill Newton, Ken Hallson and Bill McKay. Dave Ennis of the Association staff ably installed the ribbon and was the photographer

of the day. Special guest was Mrs. Margaret Carter, Past President of the Manitoba Historical Society. Walter Worona of the Parks Branch and the resident superintendent of Pinawa Park joined the group.

Mrs. Carter cut the ribbon followed by a random tour of the site. While the ceremony was quite informal, the members of the group could not but be awed by the vastness and the sturdiness of this great historic struc-

ture now some 80 years old. Having been subject to the removal of all equipment, all the superstructure and the townsite buildings, to military demolition practices to misuse and vandalism, it now rests in the peace and quiet of a Provincial Heritage Day Park providing recreation and leisure to its visitors. It is easily accessible off P.R. 313 north of Lac du Bonnet.

In addition to the plaques installed by the Province and the Association, and through the interpretive displays, the visiting public is being made aware that the first hydro-electric power for the City of Winnipeg was generated from this plant-site and transmitted in 1906.

They are also aware of the significance that this plant, the first of a series of many plants, all in operation today except Pinawa, have utilized the full potential of the Winnipeg River. It is even perhaps more significant that the location of each of these plants is very close to that proposed in the initial engineering survey of the river carried out in 1911.

In 1951 after 45 years of power generation, Pinawa was closed. Equipment was removed, and the plant buildings demolished leaving only the concrete structure. At one time it was used as the site of military demolition practice but fortunately the structure resisted the onslaught of the Canadian Engineers. More recently the site was used by bikers and much of the structure was covered with graffiti.

In 1986 the Parks Branch of the Department
(continued on page 4)

1988 APEM Annual General Meeting

ADVANCE NOTICE

This year the Association's Annual General Meeting will take place on **Friday, October 28th**. Once again, the location will be The Holiday Inn Downtown in Winnipeg.

Mark it on your calendar! Immediately preceding the meeting at 8:00 a.m., in the same location, our Professional Development Committee is arranging a *breakfast meeting*, the subject matter of which will be of interest to all of us, *no matter what line of work we may be in*. The topic will be "The Future of Engineering" and the speaker will

be *Phil Lapp, P.Eng.*, past president of CCPE and the prime mover of the CCPE Task Force on the subject. Recommendations of this Task Force will significantly alter the profession, heighten its profile and allow engineers to play a far more effective role in the business world as well as in the world of hands-on engineering.

Phil Lapp is one of Canada's highest profile practicing engineers. He is a top-notch speaker. Come out, meet him and participate in the discussion. The subject matter is of interest to every member of this Association.

Immediately following, the Business Meeting and Awards Luncheon a panel discussion will take place relating to the legal liability of engineers, particularly employee engineers, the question of the limitation of responsibility for engineering work performed, and the question of professional liability insurance. Paul Walsh, a well known Winnipeg lawyer and Claude Mercier of the Encon Insurance Group, Canada's premier provider of liability insurance for engineers will comprise the panel.

W.B. MacKenzie, P.Eng., Registrar

THE MANITOBA

Professional Engineer



August, 1988

Published by the Association of Professional Engineers of the Province of Manitoba
530 - 330 St. Mary Avenue
Winnipeg, Manitoba R3C 3Z5
(204) 942-6481

A.P.E.M. COUNCIL

W. D. Christie, P. Eng., **President**
E. A. Speers, P. Eng., **Past-President**
G. E. Laliberte, P. Eng., **Vice-President**
K. A. Buhr, P. Eng.,
O. Hawaleshka, P. Eng.
W. R. Newton, P. Eng.
G. W. Saunders, L.L.B.
J. R. McDougall.
K. J. T. Kjartanson, P. Eng.
W. McGilvery, P. Eng.
M. L. Goble, P. Eng.

GENERAL MANAGER and REGISTRAR

W. B. Mackenzie, P. Eng.

The Manitoba Professional Engineer is published under the direction of the Publication Committee

PUBLICATION COMMITTEE

Bill McKay, P. Eng., **Chairman**
Paul Gordon, P. Eng., **Editor**
Jerry Bogan, P. Eng.; Roger Kane, P. Eng.;
Vern Dutton, P. Eng.; Len Ganetsky, P. Eng.;
Don Spangelo, P. Eng.; Joe Lucas, P. Eng.;
Glenn Morris, P. Eng.; Digvir Jayas, P. Eng.
Tracy Murray, P. Eng.

CORRESPONDENTS

John Markowsky, P. Eng., Sundance
Dick Menon, P. Eng., Brandon
Alex Murchie, P. Eng., Thompson

PRODUCTION MANAGER

Vera Toth

Opinions expressed are not necessarily those held by the A.P.E.M. or the Council of the A.P.E.M.

LICENCES ISSUED IN JUNE AND JULY

J.G. Agar (Alta.)	S.R. Karandikar (Ont.)
S.N. Ager (Sask.)	R.J. Kavanagh (Alta.)
J.A. Axelson (Florida)	T.Y.A. Lee (Ont.)
J. Boily (Ont.)	W.H.W. Leung (Ont.)
A.J. Booker (B.C.)	R.P.T. Lyttle (B.C.)
J. Burford (Alta.)	S.G. MacDonald (Que.)
A. Catizzone (Ont.)	E.C. McRoberts (Alta.)
M.K. Chakrabarti (Ont.)	W.G. Miller (Ont.)
J.C. Clark (Ont.)	E.Z. Nejat (Ont.)
R. Davidson (Ont.)	E.A. Rae (Ont.)
A. Demitt (Alta.)	R.G. Ramage (Alta.)
J.T. Dokken (Sask.)	G.L. Reid (Ont.)
P.B. Elliott (Alta.)	G.A. Roberts (Ont.)
H.F. Feldkamp (Sask.)	J.M.R. Rosenthal (Ont.)
S.H. Gebler (Il.)	L.M. Sargent (IA)
K.K. Ghosh (Ont.)	J.B. Sawers (Alta.)
C. Gibson (B.C.)	L.M.D. Sharma (Alta.)
R.J. Grafton (Atla.)	T. Shen (Ont.)
T.C. Greenlaw (WI)	W.F. Waibel (Alta.)
L.G. Grainger (Alta.)	J.J. White (Sask.)
W.P. Hodkinson (Ont.)	G.C. Wilkinson (Ont.)
F.K. Hucaluk (Ont.)	G.S. Yamashita (Ont.)
J.M. Hutton (Alta.)	C.A. Zawadzki (Ont.)
R. Kaliandasani (Alta.)	

Letters to the Editor

Re: Geologists and Geophysicists

As a geologist and member of APEM, I read with interest the article by G. Laliberte, P.Eng. in the April, 1988 issue of the Manitoba Professional Engineer. The article outlines the concerns of the Association's Executive Committee with the current practice of registering geologists and geophysicists as Professional Engineers.

The roots of this situation are mired in the historical development of the earth sciences. Prior to the 1930's, all aspects of mineral exploration and mine development were supervised by a mining engineer. However, as earth science research progressed, the field of geology developed and geologists took over many of the roles of the traditional mining engineer. In today's mineral industry, the geologist handles mineral exploration, mine geology, and ore grade control, while the mining engineer is responsible for aspects of mine development and production. A comparable situation also developed in the petroleum industry.

Many fields of engineering have undergone specialization with scientific development. One need only examine some of the obscure aspects of computer, biochemical, and chemical engineering to ponder their rela-

tionship with the traditional field of engineering. In many ways, the work of a geologist today, including a mix of field activities, map drafting, and endless report preparation more closely resembles the routine of traditional engineering than do the activities of many electrical, civil, and mechanical engineers in practice today.

Although mining assessment reports in Manitoba no longer need an engineers stamp, there are other more important requirements for a geologists membership in APEM. If I am not mistaken, Securities Commissions in British Columbia and Ontario require that mineral exploration property reports being included in a corporate prospectus be authored by a Professional Engineer. Within Manitoba, several other geologists and I earn a living, in part, preparing these reports. With many millions of dollars in corporate financings depending partly on the geologists report, the need for maintaining some degree of competence and ethics is obvious. Membership in an association such as APEM helps to ensure that a reasonable degree of professional experience goes into these reports. Also, in cases of gross error or unethical behaviour, the author of these reports can be held professionally accountable.

I think that there is a rather compelling case for registration of geologists and geophysicists in a professional association. However, the small number of geologists and geophysicists in Manitoba certainly would not warrant a separate professional association. Although I would have no objection to the issuance of separate stamps for geologists and geophysicists, as is done in Alberta, I would like to be certain that it is recognized by Securities Commissions in British Columbia and Ontario, where Canada's main stock exchanges occur. Realistically though, there is no more pressing need to provide separate stamps identifying geologists within the Association than there is for identifying Electrical Engineers, for instance.

I would suggest that the most practical route to follow in this matter would be to leave the situation as it is until the number of geologists and geophysicists reaches a numerical level justifying separate identification.

William C. Hood, P.Eng. □

(continued on page 12)

NEW MEMBERS REGISTERED — JUNE/JULY —

E. Armitt	G.A. McCormick
R.O. Beyaert	D.O. McMahon
A.G. Bereza	M.E. McNeilly
G.P. Bouchard	W.J. Moore
W.J. Caldwell	S.H. Nowak
I.S. Casalla	G.R. Ozog
B.B. Chandren	Mr. Paryniuk
A.A. Clark	J.N. Rempel
J.A. Clendenan	R.A. Riesz
W.J.S. Crawford	K.N.G. Sawatzky
E.J. Dilay	R.D. Schapf
J.L. Dolovich	M. Schiller
A. Dreolini	J.R. Stecyk
A.A. Drabot	W.C. Stewart
D.P. Dubois	W.W.K. Tam
D.R. Dyker	B.S. Taylor
W.S. Ferreira	G.P. Thiele
H.A. Flemming	K.J. Van Dekerkove
B.N. Feuer	F.J.L. Waggoner
C.K. Gin	W.Q.C.W. Wong
G.E. Hornby	W.S.W. Wong
M.J. Janis	J.W. Wright
K.L. Johnson	D.R. Young
A.H.T. Lam	

Congratulations to the following people who achieved 100% on the professional practice examination:

B.B. Chandren	G.E. Hornby
E.J. Dilay	G.A. McCormick
A. Dreolini	R.A. Riesz
D.P. Dubois	L.M.D. Sharma
C. Gibson	S.W. Wong

ENGINEERING GRADUATES — JUNE/JULY —

M.C. Caron	G.D. McDonald
S.E. Cross	R.J. Prepes
R.R. Fransoo	R.J. Sawchuk
J.L. Groeneveld	

BRANDON ENGINEERS

A Chapter has been proposed. We need your support. Contact Dick Menon, 726-6076 for more information.

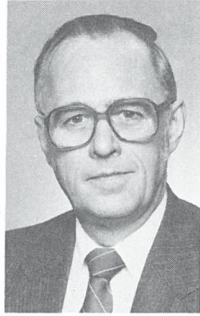
RESIGNATIONS

R.L.N. Brezden	E.B. Pearson
R.K. Dawson	D.J. Seargeant
A.K. Gupta	C.L. Sproule-Matieshin
B. McGillivray	L. Tocko
K.G. Matieshin	A. Wong.

What is CCPE?

President's Message

W.D. Christie, P.Eng.



What is CCPE? What does it do? How does it operate? Does it represent our interests as individuals? As a Profession? Is it important to the public? Does it fill an important slot in Canadian affairs? Why is APEM a constituent member? Does the country need it? Do we need it? Since we are all dues paying members of CCPE we are entitled to and should be interested in the answers to these questions. I will try to provide some of the answers.

APEM is one of twelve licensing bodies in Canada. Our mandate, our activities and our jurisdiction are provincial in scope. CCPE, on the other hand, is national in scope.

CCPE had its beginnings in 1936, not long after the various provincial statutes for the licensing of engineers were put into law across Canada. The need for a national umbrella organization to represent the profession at the national level was apparent. Today CCPE is comprised of twelve provincial and territorial Associations and collectively represents more than 130,000 professional engineers nationwide. Simply put, it is the voice of the Canadian engineering profession. Because our profession is so important to the welfare and the economy of our coun-

try and because our individual voices tend not to be heard, we need a national voice. CCPE provides it!

CCPE's prime objective is to assist its constituent associations in coordinating their activities in areas such as licensing, professional practice, education and the establishment of minimum qualifications for practicing engineering as a vital profession in Canada. It represents the best interest of the engineering community at the Federal Government level and at the international level.

CCPE has three primary standing committees which are vitally important to the APEM and to other Provincial Associations. The Canadian Engineering Accreditation Board accredits Canadian engineering education programs to ensure that they meet or exceed educational standards acceptable for professional engineering registration in Canadian Provinces and Territories. The Canadian Engineering Qualifications Board is concerned with matters related to qualifications for entering the engineering profession—particularly for candidates who may have studied abroad and do not have an accredited degree. The Canadian Engineering Manpower Board is a statistical and economic information branch of CCPE, and as such provides information to industry, to government and to educational bodies.

CCPE provides a central information service, and manages a national insurance program that is offered to all registered professional engineers. It also addresses itself to public issues which impact on the profession including research and development, continuing education and the role of the engineer in present and future society. CCPE is the representative of our profession in national and international forums.

APEM, as one of the twelve associations represented by CCPE, plays an active role in CCPE affairs. Each provincial and territorial association appoints a Director to represent it on the CCPE Board of Directors. Our representative for the past two years has been Ted Clarke. In addition, our General Manager and Registrar, Bill Mackenzie, represents us on the Permanent Staff Officers Committee of CCPE. The information which we obtain as a result of our participation in CCPE meetings and the opportunity this provides for understanding trends in engineering developments is invaluable.

Each member of APEM is a member of CCPE. Each of the Associations represented by CCPE is assessed a per member charge each year to help support the activities which CCPE carries out on our behalf. This charge, which is a part of our annual fee, is modest indeed when compared to the enormous benefits which we individually and collectively derive through our membership in CCPE.

Perhaps the most important benefit which we derive from the activities of CCPE is that our mobility within Canada is enhanced. Because our requirements for entry into the

profession are in line with those of other associations, the qualifications of our members are recognized by other Associations when our jobs require us to practice in other jurisdictions. This allows licensing or registration in other provinces or territories to be accomplished relatively easily. In this context we are presently reviewing our own Professional Practice Examination to ensure that it will be in line with similar examinations in other jurisdictions.

Many of us take advantage of CCPE sponsored insurance programs. Over the years these programs have provided us with the best competitive rates available.

The 1988 Annual Meeting of CCPE has just concluded. The North West Territories Association was the host for the meeting this year. The major subject on the CCPE agenda was "The Future of Engineering." The draft report prepared by the Task Force on the Future of Engineering was presented to the CCPE Board of Directors. The principal objectives of the Task Force were:

— To identify where the Engineering Profession is, where it should be going and how it should get there.

The Task Force's draft report includes viewpoints of ninety key executives from various regions and industries across the country. This survey had been underway and had been partially evaluated at the time of the 1987 semiannual meeting of CCPE. I reported on this subject in one of my earlier President's Messages.

Based on analysis of survey responses, and on various trends and statistics derived from the Canadian Engineering Manpower Board's records and from other information sources, the CCPE Task Force's report identified twenty-three recommendations to CCPE and its constituent associations. APEM Council, at its last meeting, proceeded to review these recommendations and be in a position to provide our position on each to the Task Force. This will be done through referral to appropriate committees for study and report back to the Executive Committee. APEM's position on these recommendations will be transmitted to the Task Force by mid September. The final report of the Task Force should be available in 1989. If its recommendations are implemented there will be significant changes in the Engineering profession in Canada.

The professional licensing system now in place in Canada is unique. It is probably the best in the world. It is designed to protect the public interest and it does so — very well! The organization we call CCPE is also unique in the world in that it provides a single national voice that speaks for the profession in Canada and worldwide. Because of the activities of CCPE, Canadian engineers are highly regarded worldwide. The role of our profession in the future, now being focused by the CCPE sponsored Task Force is enormously important to the economic and social welfare of Canadians. I am proud and thankful to be a member of CCPE.

DEREGISTRATIONS

Arison, N.L.	Mackenzie, W.G.L.
Baragar, I.B.	Mills, D.L.
Brown, D.A.	Morrison, J.S.
Burnard, B.T.	Meugge, R.J.
Chan, H.A.	Nowak, S.H.
Crawford, W.J.S.	Owsianyk, D.B.
Crouteau, J.J.M.	Patterson, M.D.
Doucette, D.A.	Paul, C.A.J.
Elias, J.E.	Pearson, R.
Ellis, G.W.	Quirt, F.H.
Enns, S.T.	Quirt, G.A.
Evans, D.M.	Reese, G.R.
Fergusson, K.C.	Robertson, A.R.
Filo, J.K.	Robson, George W.
Frogley, D.B.P.	Roylance, C.A.
Gunn, R.H.	Sabzwari, T.R.
Hamilton, D.V.G.	Sagman, J.E.A.
Herdman, D.J.	Schober, P.
Herzog, K.	Serwyllo, Orest
Hodgins, W.J.	Stalder, F.M.
Jakubak, G.N.	Tangri, K.
James, I.E.	Thompson, Brian J.
Kates, H.R.	Thorsteinson, T.M.
Kohn, B.	Treffers, J.G.
Koscevic, S.	Urbat, H.
Lennark, R.H.	Wozniak, Z.
McCrea, T.E.	Young, F.D.
McGowan, E.B.	
McIntyre, C.R.	

The History of Old Pinawa



Spillway and Forebay.

by W. McKay, P.Eng.

The power plant at the Pinawa Channel constituted Manitoba's first year-round generating plant and the beginning of hydroelectric development on the Winnipeg River. Opened in 1906, the plant's 30,000 horsepower or 22,280 kilowatt capacity supplanted the more expensive and less efficient coal-fed, steam plant which had supplied Winnipeg's electric light and power needs up to that time. Established at a time when the lack of cheap power was holding Winnipeg back from developing a vigorous manufacturing industry, Pinawa represented a crucial element in the city's growth into a leading commercial centre in the northwest. It also marked the beginning of extensive hydroelectric utilization of the Winnipeg River to supply cheap power to rural Manitoba and Winnipeg.

Construction of the plant began in April 1903 after the Winnipeg General Power Company, a subsidiary of the Winnipeg Electric Street Railway Company, obtained a perpetual lease on the Pinawa site from the

Ribbon Cut At Old Pinawa

(continued from page 1)

Department of National Resources declared the site as a Heritage Park Site and the structures were cleared of debris and graffiti and day park facilities established. Plaques and an interpretive kiosk were installed involving the research and assistance of the various hydro organizations and the Historic Resources Branch, Department of Culture Heritage and Recreation - Manitoba. □

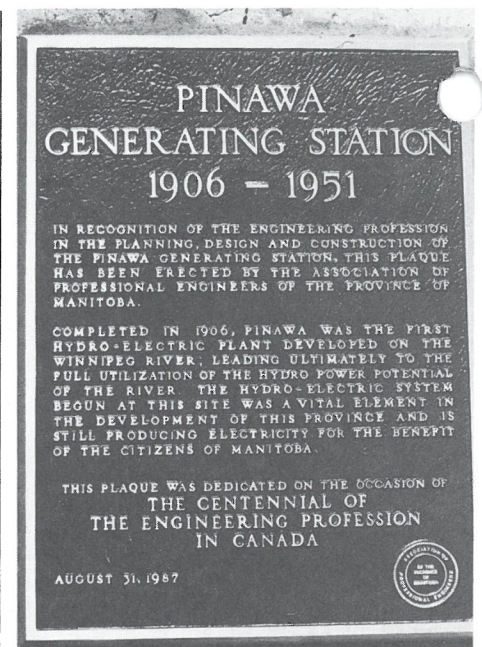
Canadian Government, who then controlled Manitoba's natural resources and the administration of power leases and regulations. Located on Pinawa Channel, a high water tributary of the Winnipeg River, the power site was constructed on dry granite. Diversion dams were later constructed across the Winnipeg River at its junction with the Pinawa Channel, in order to divert sufficient water to operate the plant year round.

Pinawa was officially opened by Lieutenant-Governor MacMillan in May 1906, and on 9 June of the same year the first power was transmitted to Winnipeg. The base rate for electricity, which up to this point had been 20 cents per kilowatt hour for light and 12½ cents for power, was reduced by fifty per cent to 10 cents and 6 cents respectively. The plant was completed in 1907 at a cost of \$3,055,000, and the power distributed to the cities of Winnipeg and St. Boniface, the Towns of Transcona, Stony Mountain and Stonewall, and the rural municipalities of Fort Garry, Assiniboia, East and West Kildonan, St. Andrews, St. Vital and Rockwood served over 25,000 people.

Officially abandoned in 1951, the Pinawa power plant represented a significant aspect of Manitoba's development in the early part of the 20th century. Not only did it mark the beginning of resource exploitation and an expansion of commercial activity in the province, it also initiated a debate over the issue of the public ownership of utilities which was to remain an important feature of provincial and civic politics for years to come.

Early History of Electric Power Generation

In 1880 Winnipeg received its first electrical power generated by steam. Shortly thereafter



Plaque at Pinawa.

the Winnipeg Street Railway Company was formed and in the transformation from horse drawn street cars to electric driven cars it sought out new sources of power including a possible hydro-development on the Assiniboine River. However by 1892 it also had a franchise to distribute electric power for residential and commercial use.

By 1900, the Winnipeg Electric Railway Company having selected the Pinawa Site, the rush was on to secure other suitable sites on the Winnipeg River.

The Winnipeg River, which connected Lake of the Woods and Lake Winnipeg, flowed in a westerly direction and was one of the best suited rivers in North America for early power production. It drained an area of 16,640 square kilometres, and the river bed in Manitoba consisted of a series of deep cup-shaped basins that formed lake-like expanses with little or no current. The water made its way from these basins by falls and rapids over rock formations that created natural power sites. The river's large volume of water varied slightly in all seasons and this, combined with its close proximity to Winnipeg and lumbering operations, made it an easily exploitable hydro resource. These factors sparked the interest of the Winnipeg Electric Railway Company as early as 1887 when the company purchased land on the Winnipeg River at Seven Sisters.

The Pinawa site was chosen by the Winnipeg Electric Company after the Pierson Engineering Company of New York recommended it as the best location for hydro development. Surveying after freeze-up, and unaccustomed to -30° temperatures, the engineers found that while the Seven Sisters area was frozen over, water was running in the Pinawa Channel. As a result, their report recommended that the channel site be developed, stating that it would give the Winnipeg Electric Railway Company a monopoly

(continued on next page)

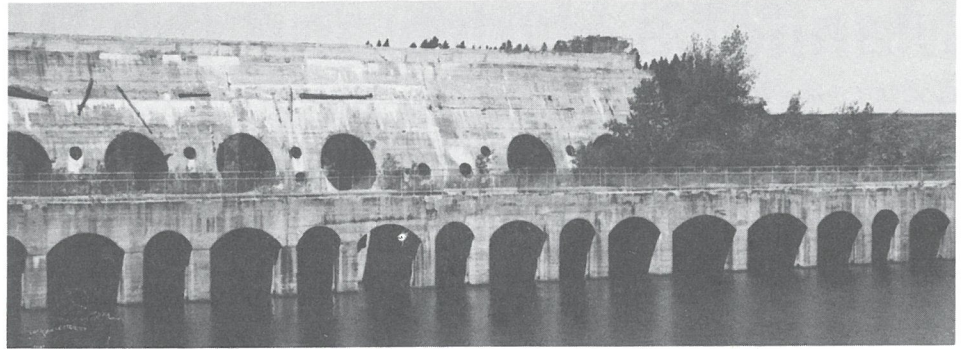
(continued from page 4)

on hydro power. The land and water was subsequently leased to Winnipeg Electric Railway for twenty-one years, renewable in perpetuity. The company was allowed to divert an average flow of 226.5 cubic metres of water per second from the main channel, and this was to play an important role in later hydroelectric development at Seven Sisters.

The chosen site was located on a channel of water which ran parallel to the mainstream and east of it. The stream was known as the "Lea" Channel, although the Indian name was "Pinnawa" or the "quiet water". In 1911 government surveyors renamed it the Lee River, but that portion upstream from the powerhouse site is still referred to as the Pinawa Channel. An old high water channel of some 40.2 kilometres, the Pinawa had been travelled by explorers since the days of La Verendrye and by the men of the Northwest Company to whom it had offered a welcome reprieve from the rapids of the Winnipeg River.

In 1903 the Winnipeg Electric Railway Company began construction on the hydro-generation station at the north end of the channel. The power house was situated at a bend in the waterway where a concrete dam with an arched spillway created a twelve metre head. The power house and transformer constituted one large building about 213.5 metres in length. The channel

was improved and enlarged with great rock cuts at various points along its length. Water was directed into the channel by three diversion dams on the Winnipeg River. The main dam, which consisted of some 396 metres of concrete and rock fill, spanned the main channel and was connected to the banks on either side by a concrete spillway. A control dam could be used to shut off the



Power House floor and turbine openings with tailrace openings below.

diverted water and return all or a portion of it to the main river via a waste or diversion weir.

Over 100 men were employed on construction for three years, and miles of corduroy road were laid over muskeg to bring in the heavy machinery and supplies. During this period a small town sprang up as employees built cottages and settled their families around camp. Once construction was completed in 1907, Pinawa became a busy self-contained community. The town featured brick houses and a row of frame dwellings and included a school, post office, general store and gardens.

Public & Private Ownership

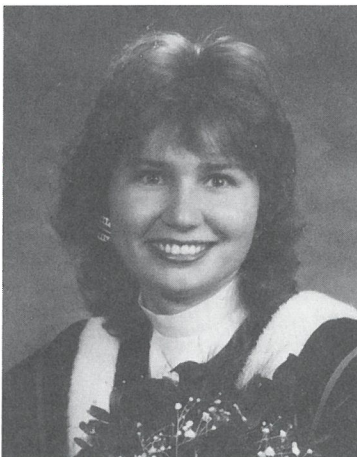
Even before the Winnipeg Electric Railway Company (later known as the Winnipeg Electric Company) started generating power, the Winnipeg City Council was concerned over the prospect of a private power company monopoly. After much debate the City Charter was amended to allow the City to generate power and City Hydro was formed. By 1911 the City of Winnipeg was receiving power from Pinawa-Winnipeg Electric Com-

pany site and from Point du Bois-City Hydro site.

A Public Utilities Commission was formed for rate investigations etc. In 1911 the Federal Government Department of the Interior who was administering the water resources of the province had investigated the Winnipeg River and indicated eight sites for power development. One of the sites, Seven Sisters was influenced by the diversion for the Pinawa Plant and the report recommended the abandonment of that plant in favour of greater development of Seven Sisters.

From 1915 to 1928 the operation of Pinawa was debated between the power companies, both public and private and between the Conservative and Liberal Governments. In 1928 the Seven Sisters Site won out with agreement to the abandonment of Pinawa in the near future. However the demands for power during World War II kept Pinawa in operation until 1950. At that time the river works were dismantled and in 1951 the plant was closed.

From Information — Historic Resources Branch — Department of Culture, Heritage and Recreation - Manitoba. □



1987/88 Engineering Senior Stick, Irene Milawoz.

by Glenn Morris, P.Eng.

During its eighty-year history the Faculty of Engineering has been served by many outstanding senior sticks. The position, that of President of the Engineering student council, has for example been held by such well known engineers as Tom Storey, Don Stephens, Don Craik, Grant Sims, and Ken Macaw.

Senior Stick Honoured

In 1987 and 1988 however, our senior stick was accorded an honor not bestowed upon any of those who had gone before — that of being named one of Canada's Ten Outstanding Female University Graduates. You could look it up (page 60 of the June, 1988 issue of *Chatelaine* magazine).

None of the others would have qualified, of course — they wouldn't have passed the physical. Every year until this one, the job of Senior Stick has been held by a man. Thus, Irene Mikawoz was breaking new ground last spring when she ran for, and was elected to, the demanding position. She had a rather busy year.

In addition to organizing and heading up the many activities of the University of Manitoba Engineering Society, Irene was a National Executive member of the Canadian Congress of Engineering Students, a double award winner in the Western Engineering Design Competition and organizer of the 1987 Engineering Freshman Orientation Program. She organized laboratory tours for APEM members who attended the Annual Meeting last October. At the Faculty level,

she was a speaker in the high school career counselling program and a member of the Engineering Faculty Council, the Facilities Committee, the Academic Disciplinary Committee and the Engineering Endowment Fund Committee. She was a member of the Senate Planning and Priorities Committee and she managed to maintain excellent grades while working evenings and weekends as Head Waitress at Mother Tucker's Restaurant. In May she was awarded her bachelors degree in Industrial Engineering.

Before entering Engineering, Irene earned her B.A. degree in Psychology at the University of Manitoba, while in Engineering, she spent summer periods studying language, in Grenoble, in Rome and in St. Boniface College. She won her share of scholarships, including a 1986 A.P.E.M. Scholarship. There's more, but perhaps the point has been made that our first Lady Stick has made her mark.

Irene Milawoz recently accepted a position with Proctor and Gamble Ltd. in Hamilton. Remember the name, you will probably hear it again. □

Manitoba Hydro and the Drought of 1988

by A.D. Cormie, P.Eng.,
Reservoir and Energy Scheduling Engineer,
Manitoba Hydro

Recent news media coverage of the drought of 1988 has not been news at Manitoba Hydro. The lack of adequate precipitation across the Great Plains of North America and resultant low river flows began almost 18 months ago and is having a severe impact on the operations and finances of the utility. The following article has been written to provide the reader with some background information on the Manitoba Hydro system, the history of the drought, and how the Manitoba power system is being operated in order to cope with the low water supplies.

The installed capacity of Manitoba's 16 generating stations is 4250 MW which on average have an annual energy production of 22,000 GW.h. However, because of poor water conditions last year, hydraulic generation was only 18,000 GW.h. down 18% from normal. This was in sharp contrast to the previous year when hydraulic production reached 24,000 GW.h. which was a new record. In order to compensate for reduced hydraulic generation Manitoba Hydro purchased a record amount of energy from neighbouring utilities and operated the three thermal stations at their highest level in the last ten years.

Manitoba Hydro must provide Manitobans with electricity at all times, not just when water supply conditions are good. Figure 1 illustrates the 75 years history of the water supply expressed each year as a percentage of the long term normal. As the figure illustrates, the water supply for the hydraulic system is highly variable and unpredictable, varying between 56 percent of normal in 1940/41 to 142 percent of normal in 1974/75.

Manitoba Hydro has recognized that the water supply is extremely variable and that severe droughts (such as the drought of 1988) are possible. As a result Manitoba Hydro relies on a hydro-thermal mix of generation. In recent years the thermal energy supply has been expanded through import contracts with neighbouring utilities rather than by building additional thermal stations in Manitoba.

From Manitoba Hydro's point of view the current drought began in December, 1986. Figure 2 illustrates the variation from normal of monthly precipitation over the Nelson-Churchill drainage basin since April, 1986. Regional precipitation data has been weighted to reflect its importance to hydro-electric generation. Accumulated precipitation in the winters of 1987 and 1988 was not much below normal, however, exceptionally warm dry springs resulted in very little runoff from the snowpack. Above normal precipitation in the summer of 1987 resulted in little improvement to the water supply because of low soil moisture levels and because this was the period of high evapotranspiration loss.

Since the generally poor spring runoff of

1987, the operating policy of Manitoba Hydro has been one of conservation. As a result reservoir releases have been kept to the minimum possible. Thermal generation at Brandon Generating Station (G.S.) began in May, 1987. A 105 MW unit at Brandon which normally would provide significant energy during a drought was undergoing major overhaul and would not return to service until the summer of 1988. As a result the Selkirk G.S. was brought on line in August 1987 to provide additional generation. The thermal stations at Brandon and Selkirk have run continually since then.

Figure 3 illustrates the relative "energy in storage" of Manitoba Hydro over the last two and a half years. Energy in storage represents the total potential energy held in all reservoirs. In spite of the poor spring runoff in 1987, energy in storage did not fall below normal until June, 1987. This was

mainly because of above normal water level at the end of the previous winter in Reindeer Lake and Lake Winnipeg. Since then, in spite of minimum possible reservoir releases, energy in storage has deteriorated as the drought has worsened.

Similar to 1987, the spring runoff in 1988 was very poor. Inflows were and continue to be near to those of 1940, the worst inflow year on record for the drainage basin as a whole. In order to have sufficient hydraulic generation for the upcoming winter, Manitoba Hydro must conserve water in reservoirs this summer. To meet the current energy requirements Manitoba Hydro is continuing to operate the Brandon and Selkirk generating stations and is purchasing energy from neighbouring American utilities. This energy will total to a third of Manitoba's 1988 summer energy requirements. □

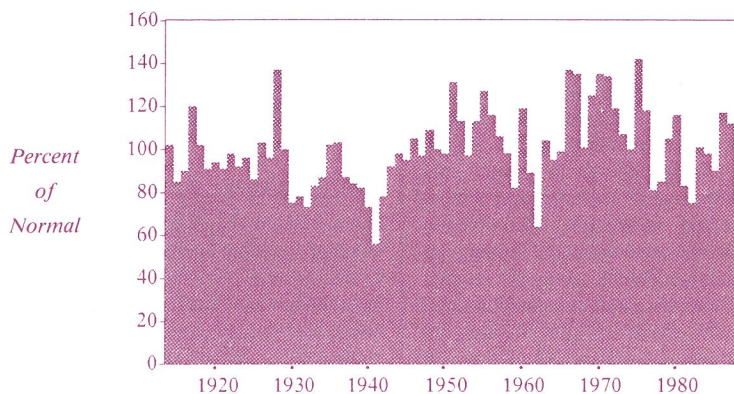


Figure 1. Water Supply to Manitoba Hydro Generating Stations.

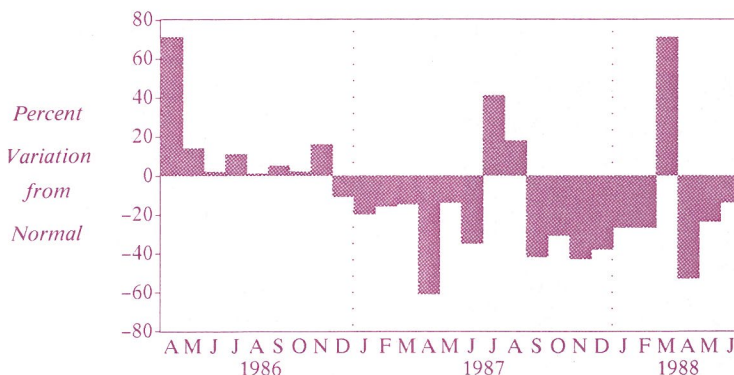


Figure 2. Weighted Precipitation Nelson-Churchill Drainage Basin.

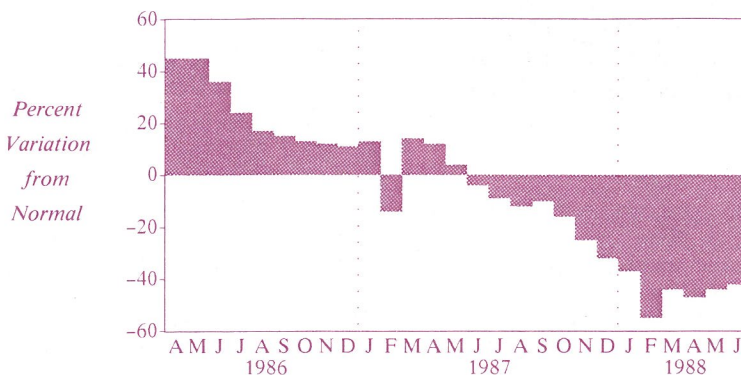


Figure 3. Energy in Reservoir Storage.

Computer Integrated Manufacturing Systems (CIMS) and the CIM Facility at The University of Manitoba

by Tai-Ran Hsu, P.Eng.

1. An Overview of CIMS

Computer Integrated Manufacturing Systems or CIMS in a broad sense include all necessary functions and operations that are required in producing any product. It may include the basic procedures such as "product specification" up to the final product marketing, a latter function of non-technical nature. What makes CIMS unique however is that all these operations are integrated and controlled by computers through special software programs.

In a narrow and strictly technical sense, CIMS is a combination of Computer-aided design (CAD) and Computer-aided manufacturing (CAM). CAD is primarily used to determine the optimum geometry and structural integrity of the product to be manufactured. CAM, on the other hand, involved all operations related to the fabrication of the product.

The composition of CIMS is by no means rigid. A Flexible Manufacturing Cell (FMC) consisting of a Computer numerical controlled (CNC) machine and a material handling manipulator can be regarded as a basic element of a CIMS. Their operations would be coordinated and controlled by a microcomputer. The knowledge and skill to design such combination and integrate these components, however, is essential to the success of such systems. In addition to achieving highly efficient production, another principal benefit is the end result high quality product. This is a critical element in today's competitive market. Contrary to common belief, appropriate level of CIMS can also immensely benefit small and medium-sized industry for the reasons mentioned above. The CIMS should not, and will not be monopolized only by giant industry such as GM or Boeing. A typical CIMS facility would involve the following hardware and software:

A. For CAD:

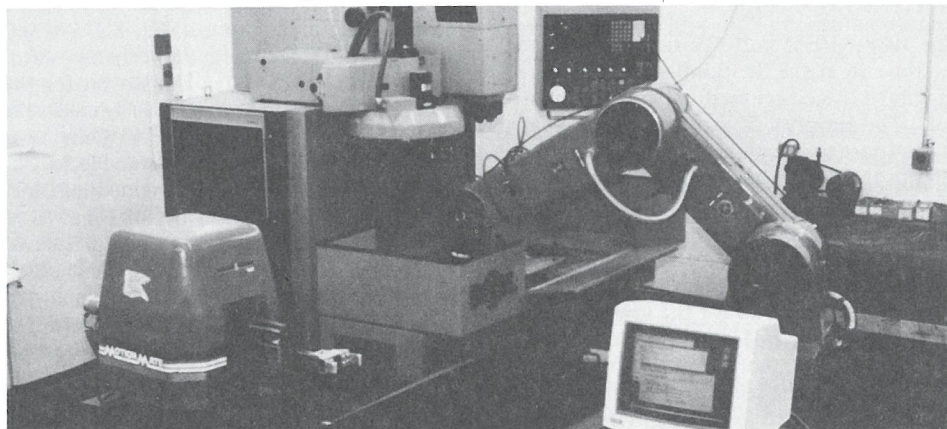
A computer is used as the central process unit (CPU) to perform graphical representation of product geometry, stress and performance analysis, process design and production planning. The CPU will also be used as the controller for the manufacturing process.

Softwares commonly used for CAD are AutoCAD, VersaCAD, CADKEY for microcomputers; SDRS, PATRAN, ANVIL, INTEGRAPHICS, ANSYS for minicomputers, e.g. VAX types; or CATIA, CADAM, etc, for mini or mainframe computers.

B. For CAM:

Major hardware include the following groups:

(1) Flexible manufacturing cell (FMC): CNC machines and robots or manipulators; (2) Automated storage and retrieval system (AR/RS): Storage stacks, gantry robots, bar-code readers, etc.; (3) Material handling



Flexible Manufacturing Cell.

systems (MHS): Electromechanical conveyor, articulated robots, automated guided vehicles (AGV); Flexible manufacturing systems (FMS): Items (1) + (2) + (3); (5) Quality assurance: Computer vision, pattern recognition, and image processing; (6) Automated assembly systems; (7) Other major hardware: Computer controlled coordinate measurements, welding, spray painting robots; (8) Other technologies: Expert systems for decision making in manufacturing; Machine tool health monitoring; Fault detections; and Machine tool dynamics.

Software for CAM operations are: MAP, QUNIX, SMARTCAM, APT for microcomputers; CALMA, ANVIL, PREDICTOR, etc. for mini and mainframe computers.

2. CIM Cell at University of Manitoba

The Industrial Engineering Program in the Department of Mechanical at the University of Manitoba was established in 1982, with an unprecedented orientation towards manufacturing/production and control. The main thrust in R & D by its staff and students has been in the development and promotion of affordable CIMS for industry with little resource to acquire imported technology. Special technology on Microcomputer-based systems integration with retrofit machine has been developed. The transfer of such technology is being demonstrated by the establishment of a new Advanced Manufacturing Technology Laboratory (AMTL) in the Department. When completed by the end of this year, this laboratory will be available to the interested general public for demonstration and experimentation of CIM technology. The Flexible Manufacturing Cell (FMC) which is the foundation of a CIMS in the AMTL consists of five (5) major components at this stage. These are:

- One — Apollo computer
- One — Motionmate pick-n-place robot
- One — Electromechanical conveyor (30' wide x 20' long)
- One — Heavy duty industrial robot (30 Kg capacity)
- One — CNC machine centre (16 tool change capacity)

All these machines were provided by different manufacturers. Expert academic and technical staff in the Department are making good progress in integrating the functions of all these machines through microcomputers. Concurrent efforts are also being made to integrate the FMC with CAD operations. Once this integration is complete, the AMFL should be capable of producing complex machine components by fully automated process. This can be illustrated by the following example of production gear:

The process will start with the conceptual design of the shape of the gear. The design engineer needs only to input a segment of the gear and the CAD software can create the entire configuration based on this input. It will also perform necessary design analysis using the finite element method. Once the optimized configuration is established, it will derive an optimum method for fabrication. The information of geometry of the product (a gear in this case) and the fabrication instructions will then be "down-loaded" to the FMC for production. By following the pre-programmed instructions, the Pick-n-place robot will pick up a piece of blank plate (raw material) from a designated location in the storage rack and place it on the conveyor which will transport the material to the other end. The material/parts handling robot will pick up the material at this point and feed it to the CNC machine centre by which the gear is cut into the prescribed geometry. The finished product will then be transported and stored in the rack following a reversed order of the material handling process. This cycle of automated production can be repeated indefinitely without human intervention.

Plans are being developed to introduce a retrofit CNC lathe to the FMC later this year. The retrofit technology utilizing microcomputer as developed by Prof. Balakrishnan and his students will be used for this special task. Once completed, a multi-tasking automated manufacturing process will be developed to maximize the usage of the two CNC machines to produce products involving multiple number of components. □

1988 APEM Golf Tournament

by T. Murray, P.Eng.

The 1988 APEM golf Tournament was held on June 28 at the St. Boniface Golf Course. In total 112 golfers teed off for 18 holes of golf. The majority of those who participated in the tournament gathered at the club house later in the day to have a delicious steak dinner.

Several prizes were awarded following the dinner. Garland Laliberte, representing President Christie, presented Doug Snider with the Landon Cup for the low gross score (77) and Ron Payne with the Sullivan Cup for the low net score (67). As well, prizes were awarded for second to sixth low gross and second to sixth low net. L. Greer had the longest drive and N. Fenton landed closest to the eighteenth hole. The remaining prizes



Low Gross Winner

Doug Snider and Garland Laliberte with Landon Cup.

were given for the most honest golfer, the most birdies, and the most 7's, 8's, 9's and 10's on the score card respectively. (Apparently the reason Dave Ennis won for the most tens on a score card was because his partner wouldn't let him count anything over ten.) A door prize of a night at Hecla was donated by Solmundson Engineering Inc. and was won by Dale Lidfors of Pinawa.

The organizing committee would like to thank all of the sponsors who made it possible to have so many prizes, and everyone who participated for helping to make the day a success. □

Four for Bridge

Left to right, Norm Ulyatt, Gord Smith, Alf Cornies, Roger Mills. Their 12th consecutive year with the Tournament.



Low Net Winner

Ron Payne and Garland Laliberte with the Sullivan Cup.

Council Reports

MAY 9, 1988 by J. W. Bogan, P.Eng.

At which Council receives reports from the University Liaison Committee, the Practice and Ethics Committee and hears a summary of a recent Canadian Engineering Qualifications Board Meeting.

W.D. Christie presided over the May 9th Council meeting. Financial statements, licences, engineering graduates, transfers, and registrations were all approved except for two reinstatements. Approval of the reinstatements would be held until satisfactory explanations were received explaining why they had allowed their memberships to lapse.

University Liaison Committee Report: The duties and concerns of the committee were outlined in a report presented by Vish Gupta, the committee chairman. Items of concern include: less specialized curricula, declining enrollment, funding, continuing engineering education, engineering standards, and a five year engineering program. Sub-committees are now investigating these concerns.

Council expressed its appreciation to Mr. Gupta for his and the committee's efforts.

Practice and Ethics Committee Report: Council had previously expressed concern over the apparent lack of information provided in reports made to Council by the Practice and Ethics (P&E) Committee. Messrs. Grimes and McQuade, members of the committee, were invited to give further explanation on the methods the P&E Committee uses to communicate with Council.

The majority of the Committee's work relates to investigating written complaints against members. A sub-committee may interview the person who made the complaint and gathers information on a confidential basis. The sub-committee then makes a recommendation to the full committee which

considers what action may be taken. Once agreed upon the Committee then advises Council.

The P&E Committee feels it should not give Council all the information it obtains because sources may not readily volunteer information if it may otherwise be disclosed. Some Council members expressed concern that other associations seem to have a significantly greater number of reports on their P&E activities. It was pointed out that the P&E Committee can only respond to written complaints and that other associations have a significantly greater number of members.

Caution must also be exercised in the reporting of an investigation in its early stages because it may influence Council members if the investigation reaches the point where a hearing is deemed necessary.

The P&E Committee recognizes the problem of communicating with Council. However, it must be recognized that the Committee takes its responsibilities seriously and carries out its work in accordance with the requirements of the by-laws.

Canadian Engineering Qualifications Board Meeting: Dr. Cahoon reported on the Canadian Engineering Qualifications Board meeting he attended March 21st and 22nd. Topics discussed there included: (1) Candidates for registration entering the examination program be required to pass two-three hour examinations encompassing the CCPE Fundamentals Syllabus before being accepted; (2) All provincial associations require candidates to pass three hour closed-book professional practice examination; (3) Raising minimum experience requirement for registration to three years; and (4) Reaching a reciprocal agreement on academic qualifications with Australia, Ireland, New Zealand, and the United Kingdom.

Council appointed R.F. Taylor as a member of the Consulting Engineers Committee and approved the presentation of the Association Brief to Government to the new Minister responsible for the Engineering Profession Act, as well as the Premier. □

Luncheon Meeting of the Research-and-Development Committee

V.L. Dutton, P.Eng.

June 8 was a beautiful day as a "full house" met at the Grant Motor Inn for the noon-time meeting of the R & D Committee. It is a different group of our members who attend these meetings from those attending the breakfast meetings of the Professional Development Committee so it was nice to meet many old friends and shake hands with a number of new ones.

The speaker, Mr. Ian Blicq, Assistant Deputy Minister, Industry Trade and Technology, addressed us on the subject of health-care industry in Manitoba and what it might become. The speaker's slides were so full of data, and came on the screen at such a pace, that I despaired of doing credit to their contents. Nor, like many in the audience, I assume, am I well acquainted with this branch of Engineering within Manitoba. However, a fortuitous conversation with a young Engineer at the meeting helped me realize that Manitoba is already well suited for developments in the health-services industry.

The first point that was made is that the lack of a conventional pharmaceutical industry in Manitoba is not a handicap. In fact, because of the thought patterns that accompany any long-established industry, it may be a definite advantage since it is the "new" pharmaceuticals that are displaying growth today and will continue to do so. As I learnt, the traditional pharmaceuticals are products of the physio-chemical sciences whereas the new bio-pharmaceuticals are products of the biological sciences, and it is

these areas of research that will service the developing biotechnologies companies in Manitoba.

Our two Winnipeg universities are rightly proud of their departments of microbiology, genetics, and biochemistry. We have a significant centre of expertise in the plant sciences at the Faculty of Agriculture and, of course, the Faculty of Medicine is a major centre of research. So, also, is the St. Boniface Hospital's Research Centre with its state-of-the-art facilities.

The Rh Institute, on the campus of the University of Manitoba, is another centre for state-of-the-art technology and the research work of Dr. Bowman is world-renowned. I learnt that the Institute is one of only three such establishments in Canada producing blood-fractionation products and that the process-line here is considered to be the most modern one in existence.

Dr. Petkaw, who works at the Pinawa Nuclear Station, is considered to be the father of super-oxide dismutase (SOD) research. A major use of SOD is for the prevention of imminent death in heart-attack victims.

The establishment of the Disease Control Centre in Winnipeg should bring much new research, and opportunities to those Engineers with the imagination to seize them.

My young informant made me aware that we might well re-examine the role the Faculty of Engineering is playing, or might play, in the future development of the biotechnology industry in Manitoba. This industry makes extensive use of Chemical Engineers, all of

whom have to be "imported" at present. Perhaps the time has come for Civil Engineering to "hive off" its Sanitary Group as the base for a new Department of Chemical Engineering.

I also learnt that ABA Biotechnology Inc. is building new facilities on south Waverly near the Melrose Coffee building. I trust that the R&D Committee will be organizing a tour of these facilities when they are opened. □

FIRE PROTECTIVE DESIGN

There will be a three day course on Fire Protective Design held at the University of Manitoba on October 25, 26 and 27, 1988. The course will be presented by M.J. Frye, P.Eng., A. Tsisserev, P.Eng. and Brian Cunningham of the City of Winnipeg Plan Examination Section. □

ENGINEERS' WIVES TEA

The Professional Engineers' Wives Association invite wives of Professional Engineers in Manitoba to attend their membership tea on Sept. 27, 1988 from 1 to 3 p.m. at the home of Mrs. Linda McQuade, 602 - 160 Niakwa Road (The Castle on the Seine). For further information, contact Linda McQuade at 257-4735. □

JUNE 13, 1988 by J. Lucas, P.Eng.

At which Council Considers Association Brief to Government on Periodic Inspection of Buildings.

As the President was unable to attend the first portion of the meeting, Counsellor Garland Laliberte, Vice President, initially chaired the meeting.

Financial Statements: After approving the minutes of the May meeting, Mr. Mackenzie addressed the outstanding query concerning Accounts Payable in the Balance Sheet. It was resolved that the Accounts Receivable and Accounts Payable items on the monthly balance sheets were 1987 year end statement amounts and would remain until the auditors finalized current year-end statements.

Licences: 19 licences were granted. One Engineering Graduate, two transfers, and twelve registrations were approved.

The review of Reinstatements developed into a lively discussion. It was noted that the majority of reinstatement requests involved former Members who had ceased paying dues and had not notified the Association of their desire to withdraw their registration.

Council shall request the Legislative Committee to review By-Law 39 with respect to the reinstatement of those members who have let their membership lapse for non-payment of fees.

Three reinstatements were approved.

At this point, President Christie assumed the Chair.

Executive Minutes: Council considered a request from the National Research Council to assess costs of a media release on the NRC.

Brandon Council Visit: Mr. Newton reported on the Council visit to Brandon which took place on May 12th. He advised that 8 councillors went to Bran-

don and met with 32 engineers from the Brandon area. The formal meeting, held after supper, including discussion on the image of the engineer, the need for public relations, the isolation of engineers in the Brandon area (particularly with respect to continuing education), the need for speakers to go into the high schools to advise the students what engineering is all about. Mr. Newton reported that Brandon area engineers have elected an executive to get the Chapter under way, and hope to become more involved with APEM affairs.

Mr. Newton had high praise for the excellent efforts of Mr. Dick Menon in arranging this meeting.

Admissions Review Board: Council approved the appointment of Mr. David Waldman as member of the A.R.B. for the remainder of the year.

Board of Examiners: Council unanimously approved the appointment of Mr. F.R. Kaita as Chairman of the Board of Examiners. Members of Council noted the excellent efforts of Mr. Pawlikewich during his many years on the Board of Examiners.

Public Relations Committee: Council approved the appointment of W.H. Brant and R.J. Pietrus to the Public Relations Committee.

Disciplinary Hearing: An in-camera session was held to discuss a potential disciplinary action of an Association member.

Periodic Inspection of Buildings: Council was addressed by Mr. Rogowsky speaking on a Safety Committee report involving the matter of "Periodic Inspection of Buildings". Council requested the Safety Committee to prepare a Brief for Council's consideration for submittal to Minister of Labour.

Reinstatements: Council reviewed the reinstatements discussed previously and agreed that, with one exception, all remaining applicants be reinstated to membership under Section 39 of the By-Laws. □

Manitoba Engineers Take Two Out of Three at Yellowknife

Russ Hood, P.Eng. and W.R. (Ray) McQuade, P.Eng. along with Philip T. Seabrook, P.Eng. of APEBC were awarded CCPE recognition for meritorious service at its Annual Meeting in Yellowknife on June 23, 1988. The Canadian Engineers Meritorious Service Awards were created by CCPE in 1981 to Canadian Engineers who have made outstanding contributions to the profession and society at large.



PROFESSIONAL SERVICE AWARD



Russell Hood, P.Eng.

Throughout his career as a consulting engineer Russell Hood has garnered an admirable reputation as a respected leader within the engineering profession and his community. His volunteer work has reflected his strong desire to return to society some of the benefits he has received as a practicing professional. His high personal standards and courteous conduct have gained him the respect of his colleagues and the public alike. At all times his actions have demonstrated his deep pride in his calling as an engineer. It is with great pride that the Canadian Council of Professional Engineers presents the Canadian Engineers' Meritorious Service Award for Professional Services to Russell Hood, P.Eng.

Russell Hood, is a native of Sydney, Australia. He is married and has two sons, two daughters and two granddaughters. A civil engineer by training, he graduated with a Bachelor in Engineering from the University of New South Wales in 1953 and as Associate, Sydney Technical College in 1957. He immigrated to Winnipeg, Manitoba with his wife and eldest son when he joined the UMA Group of Consultants as Resident Manager. Mr. Hood is currently Vice-President, Planning and Development for the UMA Group.

Russell Hood is well known to the engineering community in Canada. He has been very active in the profession's various associations for many years. As a member of the Association of Professional Engineers of Manitoba, Mr. Hood has served on many of its committees and is Past President of the

Association. In return for his many years of dedication, APEM presented him with its Outstanding Service Award in 1978. After serving as a Director of the CCPE representing the Manitoba Association, Russell Hood was elected to the Executive Committee of CCPE in 1971, and as President in 1974.

In addition, Mr. Hood served as President of the Engineering Institute of Canada in 1978-79 and was Chairman of the Association of Consulting Engineers of Manitoba. Further, he has served other engineering organizations including the Canadian Society of Civil Engineers, the Institute of Engineers of Australia, the American Society of Civil Engineers and the Roads and Transportation Association of Canada.

Russell Hood also holds an enviable record in industrial and community leadership. In the area he has used his skills and ability unsparingly toward the betterment of the quality of life in his community. As Chairman of the University of Manitoba Faculty of Engineering's Industrial Liaison Committee, he was instrumental in persuading the provincial government to provide a special three-year grant to greatly strengthen its undergraduate program and institute new programs in the fields of computer and industrial engineering. In 1987, the University of Manitoba recognized Mr. Hood's untiring efforts on the institution's behalf when it granted him its Distinguished Service Award at its June Convocation.

Russell Hood has also served his community as Chairman of the Board of Trustees of the Victoria General Hospital in Winnipeg. Currently, he is the Director of the Hospital's Research and Services Fund. He was also a member of the Advisory Board for the Strategic Research Support Program, a Director of the Winnipeg Economic Development Board, a member of the Advisory Board of the National Research Council Technology Centre, and a member of the Greater Winnipeg Gas Negotiating Committee.

Currently, he is a Commissioner of the National Capital Commission, and is a member of the Advisory Board of the Institute of Technological Department at the University of Manitoba.

COMMUNITY SERVICE AWARD

During his long and successful career, Raymond McQuade, has proven himself to be a dedicated community leader and untiring champion of the Canadian engineering profession. His volunteer work, like his professional practice, has been exemplary and speaks eloquently of his great pride in being an engineer. The Canadian Council of Professional Engineers is proud to present the Canadian Engineers' Meritorious Service Award for Community Service to W. Raymond McQuade, P.Eng.

Wallace Raymond McQuade was born in Winnipeg, Manitoba and has lived there



Raymond McQuade, P.Eng.

throughout his professional career. A family man with three daughters and six grandchildren, Mr. McQuade has long been involved in volunteer work through which he has demonstrated an unusually deep commitment to the enhancement of the quality of life in his community. A civil engineer by training, he graduated from the University of Manitoba in 1950 with a B.Sc. That year, Raymond McQuade joined the Cowin Steel Co. Ltd., as Junior Design Engineer. Today, he is Chairman of the Board, President, and General Manager of the firm.

Mr. McQuade's service to the profession harks back many years and includes active participation in committees of the Engineering Institute of Canada and the Association of Professional Engineers of Manitoba. His hard work has not gone unnoticed: APEM presented Mr. McQuade with the Merit Award in 1981 and the Outstanding Service Award in 1986.

Raymond McQuade's record of community involvement is equally impressive. From 1974 to 1980, he was a member of the Board of Governors of the University of Manitoba serving as its Chairman from 1975 to 1980. As a result of his very successful fund-raising efforts, the University of Manitoba's Glenlea Astronomical Observatory was built at no cost to the University. Mr. McQuade is also actively involved in establishing a high bay structures test laboratory at the university which will provide the Department of Civil Engineering with a much needed state-of-the-art facility for structured elements and frames. In 1985, Raymond McQuade was appointed to the Board of the Winnipeg Health Sciences Centre and is presently Vice-Chairman of the Board and Chairman of the Physical Planning and Development Committee.

In addition, Mr. McQuade has served on the Board of the Better Business Bureau of Winnipeg and Manitoba since 1982, and is active in the St. Vital Volunteer Committee of Ducks Unlimited, a wildlife preservation group. A strong supporter of the Anglican Church of Canada, Diocese of Rupertland, he has devoted much of his time to upgrading the facilities at the church's youth camp near Kenora as well as recruiting and organizing its volunteers. □

ENGINEERS HONoured BY E.I.C.

the Annual General Meeting of E.I.C. in Winnipeg on May 28, 1988, two local professional Engineers were honoured; Lloyd McGinnis — Julian C. Smith Medal and Frank Penner — a Fellowship in the E.I.C.

JULIAN C. SMITH MEDAL

Founded in 1939 to perpetuate the name of a Past President of the Institute the Julian C. Smith Medal is awarded for "Achievement in the Development of Canada".

Mr. McGinnis has spent his professional career in the civil consulting field and particularly in transportation, irrigation and waste management. His work has taken him around the world. He is consulted regularly by the World Bank and CIDA. He is currently President and CEO of W.L. Wardrop and Associates in Winnipeg. He has spent much time in community and business service, recently as Chairman of the Canadian Chamber of Commerce. He is a Fellow of the CSCE and, last fall, was awarded the Gold Medal of the Canadian Council of Professional Engineers.



Lloyd McGinnis, P.Eng.

Born in 1933 on a Manitoba farm, Mr. McGinnis graduated from the University of Manitoba in 1956 with a degree in civil engineering. In 1967 he received a Master's degree from the Georgia Institute of Technology in transportation engineering and urban planning.

Mr. McGinnis has spent his professional life in the civil consulting field. From 1970 to 1973, he was seconded to the CIDA Agency and served as a consultant to the Government of Tanzania. On his return to Winnipeg, he established Wardrop's International Division.

Mr. McGinnis has been active in community affairs having served as Chairman of the Winnipeg Business Development Corporation, as President of the Winnipeg Chamber of Commerce, as President of the Prairie Provinces of Rotary's World Community Service, and as a Director of the Winnipeg Convention Centre. He has also been a Director of Flyer Industries, has served on the Advisory Board of Royal Trust, and has undertaken special assignments for the Manitoba Government.

Mr. McGinnis was Chairman of the Canadian Chamber of Commerce in 1986-87. He

is an engineer in economic and social development, both nationally and internationally. He has shared his wide experience and understanding of local, national, and international problems, of simple and sophisticated technology, and of the problems of doing business with people in Canada and in many countries abroad.

Mr. McGinnis belongs to several engineering societies and associations. He is a Fellow of the Engineering Institute and of the CSCE. In 1986 he was awarded the Gold Medal of the CCPE.

FELLOWSHIP IN E.I.C.



Frank Penner, P.Eng.

The Engineering Institute of Canada elects annually a number of engineers as Fellows for their exceptional contributions to engineering in Canada.

Frank Penner graduated from the University of Manitoba with a B.Sc. in Civil Engineering in 1957 and an M.Sc. in 1965. From 1957 to 1961 he was employed as a construction engineer on airfields in western Canada. From 1962 to 1966 he was employed as a design engineer with the Ministry of Transport in Ottawa. During this time he participated in the design of foundations for major air terminal buildings, telecommunication facilities and an earth satellite tracking station. He authored a number of papers on diverse subjects such as settlement of structures on deep deltaic deposits and the ultimate bearing capacity of concrete pavements.

Since 1966 he has been employed by the Manitoba Department of Natural Resources. During this time he participated in the geotechnical design of major flood control works and directed extensive studies of the impact on the physical environment of proposed hydro electric projects. He pioneered the development of models to predict morphological changes to shorelines as a result of flooding and made extensive studies of channel erosion and reservoir sedimentation.

Since his return to Winnipeg in 1966 he has been active in the Winnipeg Branch of the EIC and the Canadian Geotechnical Society, serving in executive positions, on study

groups and on conference organizing committees. His most notable contribution to the local engineering community is perhaps the starting of a tradition of organizing highly successful annual short courses on a wide range of subjects of local interest ranging from waste stabilization ponds to soil compaction.

Frank has also served the wider community as a member of the Practice and Ethics Committee of APEM, and as an executive member of the local community club and of his church.

Frank has pursued his interest in geomorphology with extensive hiking in coastal and mountainous areas in Canada, Hawaii, Mexico, Nepal and will be spending his vacation this summer hiking and climbing in the Swiss Alps and the Canadian Rockies. □

AGGIES HEAP IT ON

by D. Ennis, P.Eng.

Judy Holden, the fund raising coordinator for the University of Manitoba Development Fund — Drive for Excellence, reports that the participation by Winnipeg based Engineering Alumni of the 50's and 60's in pledging support to the drive has so far not lived up to the traditional response of engineers in inter-faculty competition with Agriculture.

While the response by many engineers has been very generous, with an average pledge till the end of June by the 50's group of \$894.00 and \$681.00 for the 60's group. The response rates on the other hand are less glowing, with 35% of the 50's and 13% of the 60's responding.

On the other hand, the Agricultural Alumni from the period of 1949 — 1960 have a much higher response rate and have pledged an average of \$993.00.

Judy remains confident that, with a renewed effort and emphasis on the importance of the faculty to the Province and the City, Winnipeg Engineers will maintain their tradition of supporting the faculty. She is particularly heartened by the response from the Toronto based Manitoba Alumni of the classes of 56 and 57 who have so far averaged pledges of \$1066.00.

Manitoba Engineering Alumni may develop a greater understanding of the need to support the University and the Engineering Endowment Fund when they consider the commitment of the students. Under the "Parting Pledge Program", 55% of the graduating students in 1987 made pledges amounting to \$44,769.00 and 72% of the graduating class of 1988 made pledges in the amount of \$56,621.00. The students obviously recognize a need to support the faculty financially. Let us hope the Alumni recognize the contribution of the faculty to this Province and respond with their chequebooks.

Let's not be buried by the Aggies. □

New Ph.D. Program for Agricultural Engineering

by N.R. Bulley, P.Eng.

The Department of Agricultural Engineering at the University of Manitoba has recently been granted permission to offer a program leading to the Doctor of Philosophy Degree in Agricultural Engineering. The program will be offered along with the current M.Sc. and M.Eng. post-graduate degrees and will begin September 1, 1988.

Two areas of need have been identified for graduates of the program: a) the need for appointees to fill industrial and government research positions and academic teaching/research positions and b) the need for the knowledge generated from research carried out by Ph.D. students while studying for the doctoral degree.

The following research summaries were selected to give some insight into the Department's current research program.

a) Agricultural Power Machinery Academic Staff

L.C. Buchanan, G.E. Laliberte, J.S. Townsend

Research in agricultural power and machinery is directed towards assisting industry to design new and improved agricultural equipment. Examples of this type of research include a three-dimensional linear structural frames analysis of the deflections of a swather header manufactured in Winnipeg, the testing of air conditioning systems for swather cabs and the continuing development of a seedling depth control unit. To assist farmers in the selection and operation of their equipment, studies are in progress to determine optimum practices and equipment requirements needed to maximize crop yields and minimize soil erosion. Other projects include studies of computer-aided design of machine systems, equipment for seed and fertilizer placement and computer simulation of crop and animal production systems.

b) Soil and Water Conservation Academic Staff

G.E. Laliberte, J.S. Townsend

Research is being directed towards water and soil conservation practices under the semi-arid conditions in the Canadian prairies. In some years, there is inadequate topsoil moisture even as early as seeding time and often despite adequate subsoil moisture. In this situation, if there is inadequate residue from a previous crop, the soil is exposed to the risks of water and wind erosion. Recent and continuing research projects include computer simulation of crop growth, water-conserving irrigation methods and techniques and studies of environmental and production impacts associated and studies of environmental and production impacts associated with the use of municipal sewage effluent in irrigated alfalfa.

c) Agricultural Structures and Environment Academic Staff

M.G. Britton, D.S. Jayas, W.E. Muir

The Department is continuing its intensive research effort on the design and operation of structures and safe storage systems for cereal grains, canola and canola meal, on moisture and heat transfer in stored grain and grain products and on grain drying using low-temperature air. This work, carried out in cooperation with the Agriculture Canada Research Station located on campus, is internationally recognized and at the same time, the results are in demand by Manitoba farmers. At the request and with the assistance, of the Manitoba Department of Agriculture, practical designs, operating data and microcomputer programs for in-bin grain drying have been developed and are made available to Manitoba farmers through provincial extension agricultural engineers. This information is being continually improved and expanded. Research in the structural design area is directed at the design of grain storage systems related to dynamic

loads during emptying. Other projects include studies of the behaviour of column-to-truss connections, detection of spoilage of grain and oilseeds in storage, prediction of airflow patterns in store bulks, controlled atmosphere storage of wheat and conditioning of ventilation air using soil as a heat source and heat sink.

d) Electrical Power and Processing Academic Staff

L.C. Buchanan, N.R. Bulley, D.S. Jayas

The potential for using microprocessors for automatic control of seed cleaning and drying systems is being investigated. An inexpensive microcomputer is being adapted to a control system to continuously display operating conditions such as machine speed and level of bin fill on a monitor. Other projects include the measurement of the engineering properties and storage susceptibility of canola meal, thin-layer drying and wetting characteristics of canola and the economics of horticultural lighting for controlled environment plant growth systems.

e) Food Engineering Academic Staff

M.G. Britton, N.R. Bulley, D.S. Jayas

The Department of Agricultural Engineering is increasing its commitment to Food Engineering research. There is a need for Canadian engineering studies on the processing and handling of Canadian agriculture products. Ongoing food engineering projects in the Department include supercritical fluid extraction of biological materials, physical and chemical factors associated with potato bruising and thermal conductivity measurements of potatoes. □

Letters to the Editor

(continued from page 2)

Re: Professionalism and Unionism

I have read with great interest the April 1988 issue of the *Manitoba Professional Engineer* and noted the extent to which various of the issues raised (e.g. professional development, registration, use of seal) are also of great interest to members of the Professional Institute. The Institute, as some of your readers will be aware, is the certified bargaining agent for many engineers working in Manitoba, either as employees of the Civil Service of Manitoba or of the Public Service of Canada. As such, the Institute and A.P.E.M. not only share many of the same concerns but also many of the same members!

Given our many points of commonality, I

am all the more distressed to read the General Manager and Registrar of your Association quoted as saying "that it is not possible to be both a professional person and a member of a union" (Professional Development, p. 7). My union, which represents over 20,000 professional employees across Canada including at least 4,000 professional engineers, could not disagree more profoundly with Bill Mackenzie's statement. The Institute is committed to enhancing the excellence of professional services performed by public employee Canadians and is equally committed to ensuring that professional employees are represented effectively in decisions about their working lives. To suggest, as Mr. Mackenzie would seem to do, that there is somehow an inherent tension between pro-

tecting the public interest and expressing the interests of professionals as public employees is to advance a perspective blinkered by false stereotypes. Certainly, Mr. Mackenzie's bias is anathema to my union of professionals!

If it would be seen as appropriate and helpful by your Association, the Institute would be pleased to submit some thoughts on professionalism and unionism for a subsequent issue of *Manitoba Professional Engineer*. I believe your members should have an opportunity to judge a viewpoint on this matter different from Mr. Mackenzie's.

Iris Craig,
President

The Professional Institute of the Public Service of Canada. □