THE MANITOBA
Professional Engineer
December, 1995
APEM 75

WINGRO – Something Old, Something New in Fertilizers

By: W.G. McKay, P.Eng.(Ret.), P.E.A. Lagasse, P.Eng. & B. Amy, CET

In the consulting service dealing with wastewater treatment plant operations, the treatment and disposal of sludge – "biosolids" – was one aspect which appeared to receive the minimum of design and operation considerations. Sludge was often the major source of odour, resulting in poor community relations.

To bring himself up to date, the writer recently visited with Paul Lagasse, P.Eng., Wastewater Engineer, and Brent Amy, CET, Wastewater Contracts Supervisor at Winnipeg's North-End Water Pollution Control Centre (NEWPCC) for an interesting update on the City of Winnipeg's biosolids treatment and handling program. In the December, 1988 issue of the Manitoba Professional Engineer, there was an update on the new construction at the NEWPCC, including the planned construction of a mechanical biosolids dewatering facility at an estimated cost of $26 million. The dewatering facility was in fact brought online in July, 1990, and has been in use ever since.



Distribution truck on field. Capacity 10 tonnes.

At the NEWPCC, sludge is pumped from the primary clarifiers, at a solids content of 2 to 3 percent, to anaerobic digesters. The sludge is held in the digesters for 15 to 18 days, at a temperature of 37°C (body temperature), with continuous re-circulation. The re-circulation facilitates the release of gas, which is 60% methane, as the material is stabilized. The methane gas is recovered and used as a fuel supply in the heating system at the NEWPCC. The product of the digestion process is a black stabilized liquid of 2 to 3 percent solids content, known as biosolids. This liquid, which in the past was pumped to open "sludge drying beds", is now pumped to the on-site dewatering facility.



Biosolids-handling problems at the NEWPCC have paralleled the general problems noted earlier. In particular, there were severe odour problems associated with the "sludge-drying beds".

Prior to 1965, biosolids produced at the NEWPCC were stockpiled at the plant and offered to residents and market gardeners as lawn dressing and soil conditioner. In 1967, large open gravity-thickening ponds – or, as they were called, "drying beds", – were constructed at the northwest corner of the Perimeter Highway and McPhillips Street. The digested biosolids were pumped via a 5km forcemain to these ponds for gravity thickening. In the early years of operation, the biosolids from the ponds were stockpiled on site and again offered to the general public. Later on, in an effort to eliminate stockpiling and because production was increasing, the biosolids were applied to agricultural land. The biosolids were removed in a frozen state in the winter and hauled to designated agricultural land for spreading. This program was extremely efficient and was used until 1990.

The main problem with the thickening ponds, as previously mentioned, was the odour emanating from them. Therefore, in 1981, the City of Winnipeg began a project to investigate alternative methods of biosolids processing. Engineering studies indicated that mechanically dewatering the biosolids using centrifuges and continued land application would be the best method. As a result, the new dewatering facility was brought on-line in July 1990.

The digested biosolids are pumped to large centrifuges which are powered by 200-h.p. electric motors and spun at 2400 rpm. The liquid or centrate is collected at one end of the centrifuge and directed back to the head end of the NEWPCC. The dewatered biosolids are collected and pumped to three large storage bins using 75-h.p. piston-type pumps. The digested biosolids enter the centrifuge at 2-3% solids and leave the centrifuge at 22-30% solids. Dewatered biosolids are produced 24 hours per day, 365 days per year.

Continued on page 9

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Professional Engineer

December, 1995

Published by the Association of Professional Engineers of the Province of Manitoba
530-330 St. Mary Avenue
Winnipeg, Manitoba R3C 3Z5
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News From Other Associations

By: L. Y. Ganetsky, P.Eng.

Alberta

Mercedes Makes Better Brakes

You can't make your car's brakes think for you – but engineers at Mercedes-Benz are trying to come up with the next best thing.

They have developed a new electronic stability program (ESP), touted as a third-generation anti-lock brake system.

Professional Engineering (London) notes that the system goes one step further than predecessors. Two new sensors measure how much the driver wants the car to turn, and the amount the car is actually turning. If they don't match up, you're into a skid. ESP starts to respond within 40 milliseconds, or in just over one meter of travel, while a human takes at least 300 milliseconds, or almost 10 meters of travel.

ESP will be offered on some Mercedes models next September.

Ontario

Fibre-Optic Sensors Monitor Bridge Materials

A Toronto-based space-technology company has embedded fibre optic sensors in a Calgary bridge to monitor a new type of cable and bridge stress – a world-first application.

Using Bragg-grating fibre-optic sensors, ElectroPhotonics Corporation is evaluating the performance of carbon-fibre composite cables embedded in six of the 26 concrete girders of Calgary's Beddington Bridge, part of the Trans-Canada-Highway-bypass system. The newly-developed cables may replace the current standard prestressed steel cables.

"The fibre-optic system includes a network that runs through the girders to sensor-output devices at the base of the bridge," Robert Maaskant, Ph.D., P.Eng., vice-president, product development, EPC, said. "Calgary city works personnel can plug into the sensors and immediately determine stresses in the bridge and in the carbon-fibre composite tendons." Currently under development is instrumentation that would allow remote-bridge monitoring from a central site.

Maaskant says the sensing system was developed at the University of Toronto's Institute for Aerospace Studies Smart Structures Laboratory, where EPC is based. "They are extremely sensitive, small, durable and completely immune to electromagnetic interference, which can plague electrical-based sensing systems. And they can be bonded to a variety of materials, including steel and concrete, and can be embedded in new, fibre-reinforced plastics."

"The main benefit to bridge-design engineers is a realistic evaluation of the actual performance of bridge materials, concrete and stressing tendons," says Amit Guha Thakurtam, P.Eng., senior design engineer, City of Calgary. "The long-term durability of a bridge depends on repetition of load-cycles, impacts, de-icing agents such as salt, and exposure to the environment. With this technology, we can accurately predict when repair is needed by assessing the structure from within."

Fibre-optic sensing technology may be used on a macro scale, Maaskant says, for monitoring the structural health of large buildings and, on a smaller scale, for monitoring stress in artificial limbs.

Currently, EPC is working on a fibre-optic sensor system for high-frequency applications, including domestic emission detection and ultrasonic testing. □

ENGINEERS-IN-TRAINING ENROLLED SEPTEMBER & OCTOBER, 1995

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W.W.G. Miller (ON)
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REINSTATEMENTS SEPTEMBER & OCTOBER, 1995

C.A. Evancio
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WE HAVE LOST CONTACT. MAY WE HAVE AN ADDRESS?



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S. Chow
T. Hansen
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Lost Your Iron Ring?

The Secretariat for the iron ring has changed.

Replacement iron rings may now be obtained from either Carl Anderson, P.Eng., or Bryan Weber, P.Eng., Associate Wardens, Camp Eight, Camp of the Seven Wardens, at ph. 284-0580, or fax 475-3646.

The current fee for a replacement ring is $25.00.

President's Message

C.L. Stewart, P.Eng.



Engineers & Leadership or Why I wanted to be President!

I am somewhat humbled by being able to address the membership of APEM from the President's column of the MPE. From my involvement with the Association over the last several years I know that we have many talented and gifted professionals in Manitoba. The quality of nominees for the 1995-96 Council is an excellent example.

Since I accepted the President-elect duties last fall, the question I have been asked most is: "Why do you want to be president?" It sounds like a simple question but, like most things involving engineers, the reasons are complex.

It has often been said that engineers make projects run but they do not run them. All too often it is other people – politicians, lawyers and business and community leaders – who actually run things. These people shape our physical environment and set our policies. They get involved. They have vision. They are leaders, and they run things. And they hire us to make sure things run.

Engineers create wealth and help maintain the standard of living for everyone. We turn ideas into reality. Engineers make highways safe to drive on, clean up the environment and solve hazardous waste problems. We turn inventions into something useful. Still, we are the silent profession. The public perception of engineers – and perception is often more powerful than reality – is that engineers do not have leadership qualities. By not being involved in society, community affairs and politics, we are subject to other people's decisions and legislation.

Now let me take a left turn for a moment. Announcements of my presidency have usually included the statement "First woman to be APEM President after 75 years!!!" Obviously, being a woman adds another dimension to my term of office. I believe that in order for engineering to be a gender-equitable profession there must be role models in every facet of the profession... including our APEM Council and executive. To convince young men and women that engineering is an interesting and rewarding profession they need to see engineers enjoying their jobs and willing to serve their profession and the public.

Of course, being involved – becoming a leader – is its own reward. I know that in my case, Council meetings, executive meetings, meetings with other engineering associations and government organizations have given me new and valuable perspectives, broadened my thinking and my interests and introduced me to many wonderful people I would never have met by just doing my job as an engineer.

So why do I want to be President? As an engineer I can't let it be up to someone else to solve our problems. The only way to improve the future is to be part of it. My challenge to you is to help me change the future. Please participate in your Association. Your perspectives are important. What do you think about mandatory reporting? What it your vision of the profession 20 years from now? Should the Association exist? What do we wish to become? In order for self-governance to remain relevant, how do we respond to a rapidly changing Canadian and global environment? The APEM Council and the CCPE are attempting to find the answers to these questions and develop a system that will serve both society and the engineers. Obviously a tall order.

I challenge you to get involved in your community, in education and in politics, and to speak out on issues affecting your profession and society. Be part of the voice of the engineering community. Your efforts – your leadership – will cause things to happen and change the course of events. Help me to change the perception of engineers from people who merely make things work to an image of women and men who are leaders in Canadian business and society. I encourage you to write to me and share your perspectives and your successes as you meet this challenge. □

Congratulations D.E. Cross and R.H. Russell

At the evening dinner following the Annual General Meeting on October 21, 1995, two professional engineers were honoured by the Association.

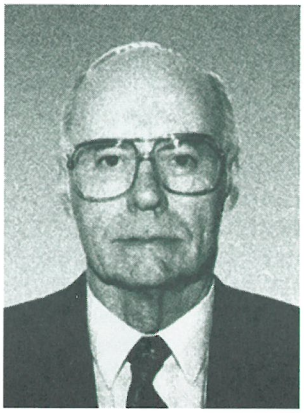
David E. Cross – Outstanding Service Award

Dave graduated from Mechanical Engineering, University of Manitoba in 1961 and was registered in 1963. He has been a continuous member for 32 years.



David E. Cross

Richard H. Russell



Beginning as a member of Council in 1980, Dave became President in 1983. He has served on numerous committees: the Nominating Committee; Consulting Engineers Committee; Executive & Finance Committee; University Liaison Committee; Publication Committee; Act Enforcement Committee; Safety Sub-Committee for Fire Protection; Investigation Committee; Awards Committee; and the APEM/MAA Task Force. This extensive committee participation is equivalent to 30 committee years of service. For this service, an Outstanding Service Award was conferred on Dave Cross.

Richard Henderson Russell – Honorary Life Membership

Dick Russell, a Manitoban, graduated in 1950 from the University of Manitoba in Civil Engineering. He registered with APEM in 1952, later joined APES, then the Order of Engineers in Québec, and then returned to APEM. His professional career was with Dominion Bridge. He moved through various offices in the company and through a number of provinces.

In his services to APEM, Dick was a member of the Practice & Ethics Committee and the Committee on Engineering Inspection and Supervision. He was also Chair, for six years, of the University of Manitoba Engineering Endowment Fund Advisory Committee. He retired from active practice in 1990.

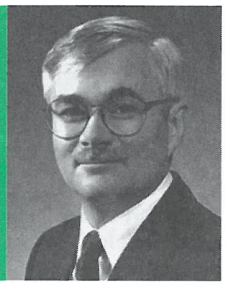
In recognition of his service to APEM, and to the profession in general in Canada, Dick Russell was granted an Honorary Life Membership. □

A Message From Council

In response to concerns expressed by the Consulting Engineers Committee regarding the letter from the Association of Manitoba Land Surveyors in the October, 1995 issue of The Manitoba Professional Engineer, Council recommends that members use their own discretion and/or acquire legal opinion in accepting surveying assignments.

CCPE President's Messages

Daniel Verreault, P.Eng.



On His Role

It has been six months since my appointment and I am just beginning to understand the broad aspects of this challenging position. Although I am comfortable with my functions as CEO, I am only now beginning to define the leadership role I am expected to play.

As you may be aware, the title of this position was changed to President from Executive Director. The change in title was accompanied with higher expectations relating to the role the President should play as national spokesperson for the Profession. This role is not easy to define. There are concerns that what might be perceived as outright advocacy could put the CCPE's Constituent Associations in a position of conflict-of-interest as they are mandated primarily as regulatory bodies. Others feel that advocacy is a natural role for CCPE to play as CCPE does not have regulatory responsibilities as such.

These are thorny problems but I am confident that they will be resolved to the benefit of the Profession and society at large through the intense consultation I am currently conducting with the Association Executives. I am also confident that our current visioning exercise, which is a fundamental review of CCPE objectives and priorities, will give me valuable guidance in this area.

However, thorny issues aside, there are some issues on which the Profession cannot afford to be silent. Women in engineering and protection of the environment are two obvious examples. I intend on being vocal on issues such as these and will seek out opportunities to make the Profession's opinions known. In fact, I recently announced the creation of the CCPE Presidential Committee on gender equity. I expect the volunteers of this Committee will provide valuable guidance.

This leads me to the final point of this message. Very early in my six-month tenure I came to realize how dependent the CCPE and its Constituent Associations are on the valuable contributions of their volunteers. These people show a level of dedication to the profession which is highly commendable. I extend my sincerest thanks to them all.

As always, you are welcome to call the CCPE office, at (613) 232-2474, or fax (613) 230-5759, if you would like more information on any of our activities or if you would like to share your thoughts on these issues. □

On Visioning

In his message on a national vision for engineering in Canada (see October 95 issue of the Manitoba Professional Engineer), CCPE Chair Garry Wacker, P. Eng., claims that all other issues such as governance, practice of engineering, etc., "... are derivatives of a much more fundamental...question: 'What are the societal perspectives and expectations of engineers?'"

I agree and here's why.

Engineers have excelled at designing and building our physical world. Unfortunately, this reality is often forgotten by the public we serve and even ourselves. Our inherent pragmatic persona, which is consumed by technical details, has made many of us oblivious to the political aspects of our modern society. You may take exception with this statement. However, the relative absence of Engineers from the public decision-making arena demonstrates our profession's propensity to remain distant from the non-technical world. The situation is obviously improving, as more of us are speaking out on issues that affect our society; but a stronger public-advocacy role is required for our society to be better served.

Technology is progressing at an ever-accelerating pace. The Internet now enables our children to access a large quantity of information, some of which is troublesome to us parents. This reality has struck a raw nerve, but has also re-awakened my awareness that we have become highly dependent on technology. Yes, this is a cliché; and clichés, like our noses, are easy to overlook. We depend on technology for tangible basics such as food, water, shelter and transportation. We depend on technology for many less-tangible basics such as health-care, communications and information. We also depend on technology for a myriad of tiny things that make life just that much easier – from "high-tech" toothbrushes and razor blades to the ubiquitous remote-control. As has been said so eloquently, it is getting ever more difficult to leave our technological house.

But, most significantly, we are learning to depend on technology in areas that come much closer to those intangibles that make us human beings. We turn to technology for entertainment, whether it be of the passive type like television or the interactive type like computer games. More and more we turn to technology for education, for some human warmth and for sharing information and experiences. Some even turn to computers for sex!!

No one doubts that very few of us would survive for more than a very few days were we suddenly plunked down in the "wild". But even if we were given the necessary food, water and shelter, would we not continue to feel isolated not only from others but from our inner selves, from the human beings we have become? For better or worse, our technologies have defined us. They have become us. We have become them.

This increasingly symbiotic relationship with technology becomes obvious to anyone observing his/her family. Do you really believe your child would develop into a well adjusted and happy member of modern society if he or she were suddenly cut off from access to computers for education or entertainment? Would your relationship with your spouse be different if he or she gave up that cellular phone? Even at a simple level, the answers to these questions are not obvious. What if I'd asked questions on nuclear power-generation?

As engineers, we have been intimately involved in raising the edifice of technology. As a society, we have seen that technology can be a two-edged sword – and that has sparked much debate. Unfortunately, the voices of those who design and implement the technologies have not made themselves heard often enough.

As Garry Wacker says, we have embarked on a process to establish a vision for the engineering profession in Canada. I believe that the profession is demonstrating a lot of courage in undertaking such an initiative. The process will be long and it will, at times, be hard. But it is absolutely essential that we come to terms with what a modern society expects of its engineers and what engineers can and should expect of their profession. Engineers must take every opportunity to publicly articulate their views on the ethical, moral and technical questions facing modern society. This goes beyond the technical specialization.

I urge all engineers to get involved in forging a new vision for the profession. If at some point during the process you feel some frustration or doubt the usefulness of the exercise then I ask you to think of your loved ones and how dependent they are on our technologies – on our handiwork. □

– Notice – Payment of 1996 Fees

Membership fee invoices have been mailed to all members and Engineers-In-Training. If you have not received yours, please contact the APEM office. Please be reminded that, according to the By-Laws, THE ANNUAL MEMBERSHIP FEES ARE DUE AND PAYABLE BEFORE JANUARY 1, 1996.

For those members no longer practising in Manitoba, and wishing to resign in good standing, letters of RESIGNATION of membership must be received in the Association office ON OR BEFORE DECEMBER 31, 1995.

Applications to RENEW NON-RESIDENT membership, or to TRANSFER TO or RENEW RETIRED membership must be received in the Association office ON OR BEFORE DECEMBER 31, 1995.

Members who are unemployed may qualify for deferral of dues. The notice accompanying the invoice provides details of eligibility.

Louisiana Pacific OSB Plant in Swan River, Manitoba

By: C.P. Gray, P. Eng.

Louisiana Pacific was founded in 1973 as a spin-off from Georgia Pacific. With its head office in Oregon, Louisiana Pacific has 129 operations in Mexico, the United States and Canada and employs 13,000 people. Louisiana Pacific produces oriented strand board (OSB), siding, engineered joists, laminated veneer lumber, fiberboard, wallboard and construction panels, residential insulation, plywood, windows and doors.

Louisiana Pacific was first established with an OSB mill in Dawson Creek, B.C. in 1987 and later a pulp mill in Chetwynd, B.C. and a construction-panel plant in Port Hawkesbury, N.S. Most recently, Louisiana Pacific is building an $80 million OSB mill near Swan River, Manitoba.

Swan River was chosen because of its road and rail access, its proximity to export markets and its excellent source of raw materials. Using 17 site-selection criteria, this site was chosen as the most suitable of eight possible sites. The 130-hectare site, 20 miles east of Swan River on Highway 10, will consist of a plant facility, raw-material storage area, parking area, fire-protection pond and an electrical power distribution system. The OSB plant is a 28,000 square metre process facility and will use approximately 900,000 cubic metres of logs per year (the equivalent of 465 million square feet of 3/8 inch OSB). The plant will operate 24 hours a day, seven days a week.

OSB is a structural panel that uses hardwoods such as poplar or white birch as its raw material. Panels are manufactured by mechanically flaking logs into small rectangular strands that are sprayed with resin, formed into a mat, and compressed and bonded under high temperature and pressure. OSB looks and feels like solid wood but does not warp and cuts cleanly without splintering. OSB nails like solid wood and is available in a range of thicknesses and sizes. One of the main economic advantages of OSB is that it does not require large diameter or "old growth" logs.

The OSB process has been operating on an industrial scale in the US for 15 years. Louisiana Pacific pioneered OSB production in the 1980's and is currently operating 17 OSB facilities in North America, producing 3 billion square feet of OSB panels annually. Louisiana Pacific is the principal producer of OSB in North America with approximately 40% of the market. The OSB market-share of structural panels grew from 1.5% in 1970 to its present market-share of 27%. Plywood represents the major product competition for OSB. Because manufacturing costs of OSB are significantly below that of plywood and raw material supplies for plywood are primarily concentrated around the Pacific Northwest, which is facing increasing supply constraints, it is expected that OSB will capture most of the future market growth.

The Manitoba Department of Natural Resources develops long-term management plans to guide the actions of resource-harvesting companies in a manner consistent with provincial commitments to substantial development. Companies harvesting timber must file a 10-year Forest Management Plan which meets government requirements. The foundation for all Forest Management Plans is the Annual Allowable Cut set by the DNR Forestry Branch. As well, forestry management plans are subject to comprehensive and mandatory environmental reviews, including the development of an Environmental Impact Statement. There is an Interim Forestry Management Agreement between the Province of Manitoba and Louisiana Pacific to have rights to harvest hardwoods in the Duck and Porcupine Mountains and Repap Manitoba to retain the rights to harvest or purchase the softwoods. The agreement includes the repatriation of some of the Repap timber rights. □

Public Awareness Committee Seeks Members

Are you interested in promoting engineering in the community? In schools? Are you looking for an exciting way to obtain Professional Service Points? Then perhaps you should consider joining APEM's Public Awareness Committee! For more information, please call Shirley Matile @ 942-6481.

Report on Salary Survey Questionnaire

Some 65 comments were received from the questionnaires returned in connection with the annual salary survey. The committee felt this information was note-worthy and Council felt that some recognition of these comments should be made in the Manitoba Professional Engineer.

The following is a random collection of replies. A more complete tabulation is available at the Association office.

- The APEM Salary Survey is very useful.
- I believe it would be beneficial if all members of APEM were to attend professional development seminars or workshops.
- I suggest that there are a lot more engineers earning less than averages calculated by APEM. Those earning less are not responding.
- Unionize.
- Compare public vs. private-sector workweeks.
- Classification rating guide inadequately takes into account the responsibilities associated with managing budgets.
- I believe this entire process (this form and the guide) to be a complete waste of time, effort and money.
- Unemployed – Associations should set up Bulletin Boards to help members find employment or companies find employees.
- Gender has no place in this survey.
- What about race, colour, religion, etc.
- Matching line of education with line of engineering should be evaluated.
- I would like to know how many engineers are contract workers and how many are full-time employees.
- Contract employees should be identified.
- Your APEM point system does not reflect modern committee management techniques of supervision.
- Good reference, keep up the good work. □

Editor's Note:
The Manitoba Professional Engineer has published and will continue to publish "Positions Wanted" when requested by members.

Ron Britton Does It Again – and Again!

By: S.M. Matile, P.Eng.

APEM Councillor and University of Manitoba Bio-Systems Engineering Professor, Dr. M.G. (Ron) Britton, P.Eng., continues to rack up awards. This summer, he was honoured with two national teaching awards: the 3M Teaching Fellowship and the prestigious CCPE Medal for Distinction in Engineering Education.

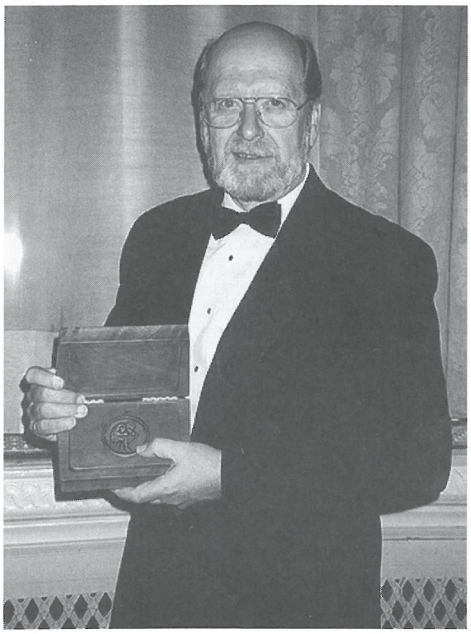
The 3M Teaching Award, sponsored by 3M Canada Inc. and the Society for Teaching and Learning in Higher Education, recognizes individuals who not only excel in the teaching of their own courses, but demonstrate commitment to and leadership in the improvement of university teaching.

The CCPE award, offered for the first time in 1995 (the ceremony will take place in Ottawa in November), recognizes an exemplary contribution to the teaching of engineering at Canadian universities.

Although best known for his farm building design, Dr. Britton has earned reputations as both a first-rate teacher and a leader in assisting others in improving their teaching. He is a founding member of the University Peer Consultation Program at the University of Manitoba, and he regularly and willingly publishes and shares his innovative ideas about teaching through publications, conferences and workshops.

Dr. Britton has long been known for his genuine interest in his students, and his ability to bring "real world" engineering into the classroom.

Congratulations, once again, Ron! □



Dr. M.G. (Ron) Britton, P.Eng., with the CCPE Medal for Distinction in Engineering Education.

American Concrete Institute Manitoba Chapter

By: J. Bockstael, P.Eng.

There are currently 62 Professional Engineers out of a total membership of 184. The balance of our list is made up of contractors, technicians, suppliers, government representatives and educators involved in the local concrete industry.

Established in 1989, the ACI Chapter serves to expand the knowledge of its membership and keep it up-to-date through dinner meetings, seminars, tours, workshops and discussion groups.

The Manitoba Chapter is geared to local interests. The needs of the membership drive the program efforts. Speakers – specialists in their fields – are brought in from ACI resources or recruited locally to address key topics for our part of the world or to introduce innovative ideas.

All of the Chapter's efforts seek to upgrade the quality of concrete projects in our province. It serves as a network to provide advice and instruction to the industry. It strives to improve the practical knowledge of our community. Of note is the development of the course "ACI Certified Concrete Field Testing Technician" to meet the growing requirements for providing certified technicians to public-works projects from suppliers, contractors and consultants.

Membership in the ACI – Manitoba Chapter would certainly contribute to the professional development of any engineer practicing in the concrete or construction industry. In turn, Professional Engineers, through their participation, would enhance the Chapter and elevate its resources.

Joining this chapter is an important step to ensuring access to local action, local contacts, and local answers contributing to the progress of concrete.

We invite Professional Engineers to strengthen our ranks. Please contact one of the board members listed below or write to ACI – Manitoba Chapter, P.O. Box 1703, Winnipeg, Manitoba, R3C 2Z6 to obtain a membership application or further information on the benefits that the annual $15.00 fee ($40.00 for 3 years) can provide. □

ACI – Manitoba Chapter Board of Directors:

President	Michael Hatch, P.Eng.	943-3178
Past-President	Bruce Blackett, P.Eng.	338-93113
Vice-President	John Bockstael, P.Eng.	233-7135
Secretary	Rob Duerksen, P.Eng.	452-4011
Treasurer	Julien Lavergne, P.Eng.	477-1260
Membership	John Bockstael, P.Eng.	233-7135
Newsletter Editor	Wally Rooke, P.Eng.	237-5075
Directors at Large	Don Flatt, P.Eng.	488-6999
	Ruth Eden, P.Eng.	945-5214

Practice Note: Attention to Detail

Recently the Association has received a number of expressions of concern about the care and attention that some professional engineers are exercising in designing and supervising the engineering work for which they are responsible.

One of these cases involved the preparation of documents submitted to the Authority having Jurisdiction in support of Development Applications for a number of buildings. In this case the information and detail on these documents was found to be too inadequate for anyone to effectively determine whether the proposed projects would be developed and completed in compliance with the applicable sections of the relevant statutes, regulations, standards, codes, by-laws and rules applicable to the projects.

Another case involved the supervision and inspection of a project to repair and renovate a residential building foundation. In this case, inadequate care was exercised to ensure that the repair and renovation work was carried out in compliance with the drawing and specifications which had been prepared and approved for the project, and in compliance with the applicable sections of the relevant building codes and regulations.

The Professional Engineers' Code of Ethics indicates clearly that the professional engineers shall:

(a) make responsible provision to comply with statutes, regulations, standards, codes, by-laws and rules applicable to all work (clause l.c); and

(b) employ all reasonably attainable skill and knowledge to perform and satisfy the engineering needs of each client or employer in a professional manner (Clause 3); and

(c) act as a faithful agent and trustee in professional matters for each client or employer (Clause 3.a).

Each professional engineer is encouraged to examine his or her practices in the light of the above noted clauses of the Code of Ethics, and to act in such a way as to ensure that the engineering needs of each client or employer are satisfied in a professional manner. □

1995 Annual General Meeting

By: H.F. Lobo, EIT

The 1995 Annual General Meeting was held on Saturday, October 21 at the Westin Hotel. Approximately 100 members and 17 EITs were curious enough to show up. The meeting began promptly at 9:00 with the introduction of Council members and distinguished guests from CCPE and other Associations by President Don Osman. All Councillors were present, except for Arthur Kempan. There was a moment of silence for those members who had passed away. The following events were highlighted.

Fee Schedule and Budget

Annual dues for registered members will be increased by $3 to $198 for next year. The fees for EITs will remain unchanged. The budget was received as information.

Accountability Session

The Manitoba Law Reform Commission's Report

A presentation was given by Councillor Ron Britton, with regard to regulating professions and occupations. The Report itself contains 90 separate recommendations and many are in keeping with present APEM practice as well as Council philosophy. Nine of the recommendations relate to the Scope of Practice and Regulated Services and will be important as they propose that professions and occupations be regulated on a "task-based model". Essentially, this would mean that activities be defined as a series of specific tasks. Ron pointed out that this could lead to an individual certified for concrete beams although not necessarily certified for, say, steel beams. In the eleven Entry & Practice Standards recommendations, there will be no "grandparenting", and a government body will set standards. Ten other recommendations propose the creation of a single, independent entity, operating at arm's length from government, to be charged with the responsibility of administering all regulated professions and trades in the province. It is difficult to realize the precise nature of this proposed organization based on need, cost, practicality, or potential benefit, as Ron stated. Copies of the Report can be obtained from the Publications Branch, Office of the Queen's Printer, 200 Vaughan Street.

Proposal regarding Mandatory Reporting of Professional Development

This proposal was given by Mike DeWiele, of the Professional Development (PD) Committee. As an introduction to this area, there were many questions that needed to be answered such as: why document PD?, why report PD?, what's in it for me?, and what's the Association's plan? A handout was given to the members in attendance as well as a questionnaire describing the attributes, some misconceptions and the concept of Mandatory Reporting. Mike presented information on duty & ethics – obligations of Engineers, benchmarking – how do we compare to other associations?, transferability – as a safeguard to practise engineering elsewhere, and self-regulation – prove the claim that we are the best people to regulate our own activities. Did you know that the US National Society of Professional Engineers (NSPE) has already required a minimum standard of PD activity before registration renewals in seven states? Over the next five years, another 21 states will be implementing similar systems. If we were to dissect this issue, the crust of the matter would converge on Mandatory Reporting. How much PD is good PD? A simple answer would be – we don't know. Certainly, one of the major hurdles would be outlining an acceptable definition of PD. As a hot topic in the months to follow, PD will require of its members a single concept often associated with apathy: **participation.**



Cathy Stewart receives gavel from Don Osman.

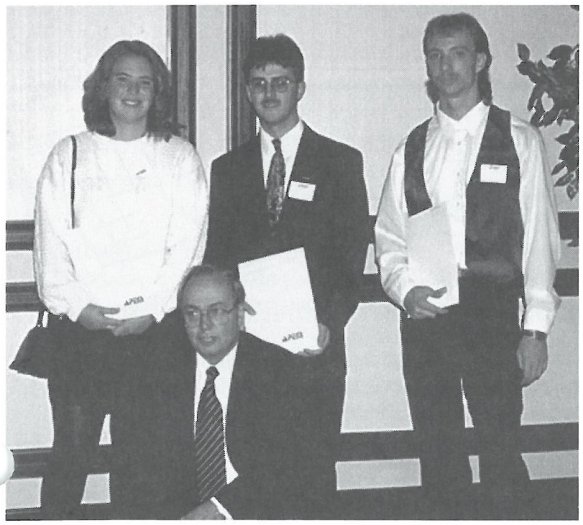
Proposed Revisions to the Engineering Profession Act

A summary of the proposed changes to the Engineering Profession Act was presented by Legislation Committee member and newly-elected councillor Don Spangelo. Some of those changes included: adding the registration of geoscientists; adding group practice provisions, requiring a Certificate of Authorization to provide a point of entry for investigations into complains against engineering corporations as well as individuals; shortening the six-month grace period after non-payment of dues to two months; and providing for the issuance of an electronic seal. Since the impact of the Report of the Law Reform Commission is uncertain, it will be difficult to assess the exact nature of changes of the proposed revisions. But, there are plans to have future consultation with committees and the membership of APEM. So please stay tuned.

National Survey of Workplace Conditions for Engineers

Carol Roberts, Chair of the Women in Engineering Advisory Committee (WEAC) and newly-elected councillor gave a presentation on an Ontario-based survey which included participation from members of APEM. The survey, made

Continued on page 9



U of M students Denise Bailey, Hubert Boulet and Blaine McFarlane received APEM Scholarships from Awards Committee Chair Carl Anderson at the AGM Wine and Cheese Reception.

AGM Wine & Cheese Hoopla

By: H.F. Lobo, EIT

The Westin Hotel was the site of this year's reception, which took place on October 20th. The event acknowledged the contributions made by committee members, award recipients, and past presidents, and recognized the recipients of the 1995 APEM Engineering Scholarships. Don Osman's wife, Toby, was given a huge "husky" in honor of her support of APEM. Life now for both of you should get back to normal, shouldn't it?

APEM Engineering Scholarships were given to, essentially, 3rd year students, including Denise Bailey (Agricultural), Hubert Boulet (Civil), and Blaine McFarlane (Mechanical). Other winners, who were unable to attend: Curtis Reimer (1st year), Karl Brahn (2nd year), David Gerhard (3rd year Computer), and Russell Dyck (3rd year Electrical).

It was unfortunate that there was no elevator music, although there was much mingling. We were able to polish off all the "good" wine – that should account for something. □

Council Reports

Tuesday, September 12, 1995

By: W.G. McKay, P.Eng. (Ret.)

AT WHICH COUNCIL CLOSES A LOOPHOLE AND AGREES TO RATIFY THE NAFTA

The meeting commenced with President D. Osman, Vice President C. Stewart, and Councillors A. Permut, S. Ursel, R. Britton, and M. Symonds present. This was insufficient to provide a quorum, but Councillor B. Thomson joined the meeting later, and all previous motions were ratified. Financial statements for the year-end indicated a surplus. However, a $3.00 increase in fees, to $198.00, was approved for 1996.

Registration – Transferees

It was brought to the attention of Council that some out-of-province engineers, who had allowed their local registrations to lapse, had found that, upon application for Manitoba registration, they would be required to provide references and take the professional-practice seminar and examination. To avoid these requirements, applicants were re-instating their former registrations and applying to APEM for transfers. Council approved a change in the requirements for transferees by establishing a minimum time for which a person must have been registered elsewhere in order to be eligible to transfer to APEM.

Electronic Seal

Mr. Symonds commented on the increasing need for document and plan security as new software and hardware, which are becoming more readily available, have set up programs such that the security of original documents could be jeopardized.

Application Deadlines

Council, after much discussion on the matter of deadlines for applications and fees for examinations, agreed that deadlines should be met, and that even as little as one day's lateness should not be allowed. Otherwise, Council would find itself in the position of establishing a precedent, therefore nullifying the original intent of the deadlines.

North American Free Trade Agreement and CCPE

Under the NAFTA, it is anticipated that there will be applicants from the USA and Mexico seeking registration in Manitoba. Manitoba engineers will also be seeking registration in these two countries from time to time. Mexico has no system of registration at present but will be using the Canadian model for registrations in the near future. After considerable discussion related to the protection of the standards of the Manitoba registration system, it was agreed that Manitoba's representative on CCPE could support the ratification of the NAFTA Mutual Recognition Agreement.

Mandatory Reporting of Professional Development

Mr. Kramble, Chair of the Professional Development Committee, outlined the presentation which will be made at the Annual General Meeting. It should be noted that the Committee is recommending a requirement for reporting only, as the first phase of what may become a mandatory program of professional development to enhance competency.

Revisions to Act and Bylaws

Council agreed to present the revisions to Act and Bylaws at the Annual General Meeting and any following special meetings as required.

CCPE Budget

After the review of the budget, expenditures for the public awareness program were questioned as to the best use of these funds. The validity of the Human Resources program, particularly the ultimate use of the information on an Association level, was also questioned.

Gender Equity

Carol Roberts has been appointed as the Manitoba representative on the CCPE Gender Equity committee.

With the loss of a quorum at 5:00 p.m., the meeting adjourned. □

Monday, October 2, 1995

By: C.P. Gray, P.Eng.

AT WHICH COUNCIL CONTEMPLATES TECHNICAL NETWORK AND CONCLUDES TERM

The October 2, 1995 Council meeting completed Stella Fedeniuk's, Arthur Kempan's and Bob Partridge's two-year commitments as APEM Councillors. As well, Doug Chapman's term as Past-President is complete. Ertrice Eddy and Bonnie Thomson have accepted additional two-year terms as APEM Appointed Councillors.

Council discussed an agreement between the Association of Professional Engineers of Ontario (PEO) and Novell Canada Ltd., which resulted from an enforcement action by PEO against Novell for its use of the title "Certified Network Engineer". Novell has agreed to remove the title "engineer/ingenieur" from its Certified Network Engineer program and certificate holders are to discontinue the use of the title "engineer/ingenieur". New certificates will not reference "engineer/ingenieur", but new certificates will not be issued to existing certificate holders. Novell wants the right to use the title "CNE" for certificate holders and continue using the program name of "Certified Network Engineer Program". PEO has requested that all Canadian engineering associations sign the agreement. Council defeated the motion to sign the agreement, but authorized the President to sign the agreement should CCPE sign the agreement.

CCPE supports the creation of a separate parallel organization to represent the interests of geoscientists at the national and international levels and has summoned a task force to study how it can be implemented. There are, at present, about 10,000 geoscientists in Canada, primarily in Alberta. At present, only four provincial/territorial associations have full registration of geoscientists. Given that the meeting of the CCPE Board of Directors is in November, 1995, Council authorized the Executive Committee to decide if APEM should become one of the founding members of the Canadian Council of Professional Geoscientists (CCPG). Executive Committee will review the APEM By-laws and further information that is to be supplied by the CCPE Task Force. Some financial commitment would be required by APEM to help the organization get started. However, it is intended that CCPG be self-supporting within a couple of years.

Council discussed a recommendation by the Professional Development Committee that an electronic technical network, for APEM members to exchange technical information, be created and that APEM manage incoming information. The PD committee estimates that 176 hours per year of staff time would be required to manage the network. Council asked the PD Committee to demonstrate a need for a "Tech Net" by implementing a prototype and reporting on its utilization. □



Mark Your Calendars

Engineering Management Seminar –

"Electronic Business Management"

This one-day seminar will include topical presentations on innovative and contemporary issues such as: The Information Highway, Workflow Software, Electronic Seals, and a Panel Discussion/Case Studies on "Automation in the Workplace".

Date: Thursday, February 22, 1996

Place: Norwood Hotel

Further details will be provided in the next general mailing.

Presented by the APEM Professional Development Committee.

Something Old, Something New

(Cont'd from page 1)

The average production is 134 wet tonnes per day or 35 dry tonnes per day at a solids content of 26 percent.

In conjunction with the dewatering facility, the City of Winnipeg introduced a new name for the biosolids utilization program, WINGRO. This environmentally-sound program builds on many successful years of land application of biosolids. Under the WINGRO program, dewatered biosolids are hauled from the NEWPCC and spread on agricultural land year-round, weather permitting. In conjunction with terms prescribed in a license issued under the Manitoba Environment Act, biosolids can be applied to a field at a rate not to exceed 56 dry tonnes per hectare. Once this maximum loading is reached, biosolids can not be applied to this land ever again. At present, biosolids are spread on each field only once at approximately 54 dry tonnes per hectare.

Research conducted by the Department of Soil Science, University of Manitoba and by the Research Branch of the City of Winnipeg indicated that:

a) Heavy-metal uptake by plants into the leaves, stalk or grain is not a problem;

b) Nitrate migration through the soil into groundwater is not occurring; and

c) Heavy-metal accumulation in the soil is not a problem.

It should be noted that this research has been conducted over many years and included the old land-application program as well as the new WINGRO program. As well, research is currently being conducted to determine if there is any migration of heavy metals through the soil.

At present, the City is only accepting land that is within 70 km of the NEWPCC. Farmers originate the process by formally requesting to have biosolids applied to their land. Before any land is accepted into the program the field is inspected in terms of location and accessibility and the soil is tested for phosphorous and nitrogen content and pH. In addition, approval to apply biosolids must be granted by the Rural Municipality in which the land is located. Individual fields are identified by farmer request and are priorized by date of receipt of such request and location and whether or not the farmer is prepared to fallow his land for summer application.

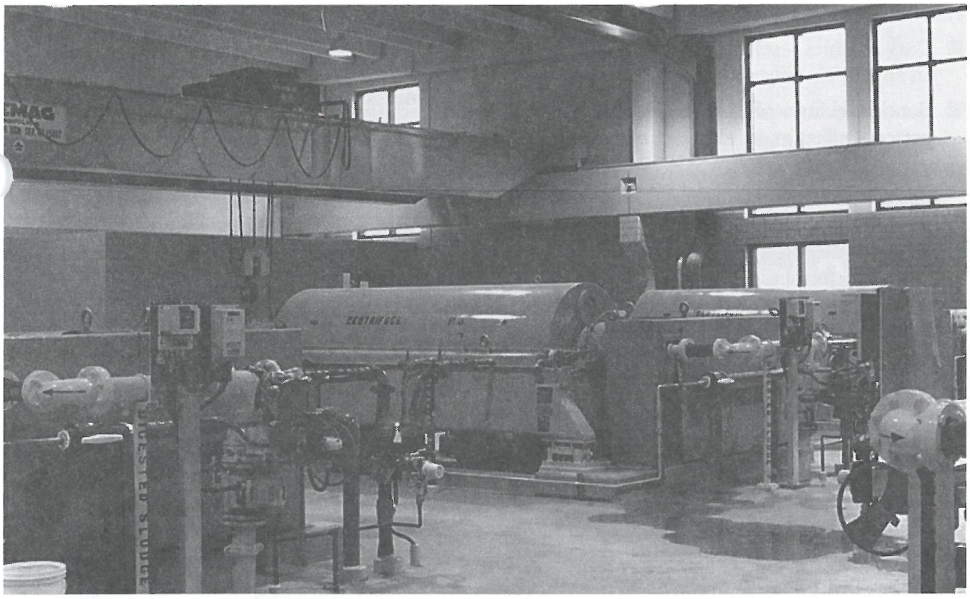
Biosolids are hauled from the dewatering facility in covered trucks, approximately 21 tonnes per load, to the field where they are dumped into a metal container. The biosolids are then loaded, using a large back-hoe, into a specially-built spreading vehicle which is equipped with flotation tires to minimize soil compaction. During the summer, the applied biosolids are incorporated, on a daily basis, using a disc or cultivator and tracked agricultural tractor. Biosolids that are spread in the winter are incorporated in the spring as soon as the fields are dry enough.

Dewatered biosolids are delivered to the field, spread and incorporated at no cost to the farmer. For his part, the farmer must agree to grow a crop other than a fruit or vegetable crop in the growing season following biosolids application. At the present time approximately 100 ha of stubble land and 135 ha of fallow land are required annually.

Dewatered biosolids are temporarily stored on an asphalt pad when wet-weather conditions make the fields inaccessible. The biosolids are hauled from the pad to the field when conditions allow. Cold temperatures do not seem to cause any disruption, as biosolids have been spread in temperatures as low as -37°C. However, biosolids will be co-disposed with refuse at the Brady Road Landfill site if the fields are inaccessible for long periods of time in the spring and summer or due to cold weather in the winter.

The WINGRO program is operating with a great deal of success. The farmers who have had biosolids applied to their fields are very pleased with the results. The crop production is approximately equal to fields that had been commercially fertilized. All aspects of the program are closely monitored by both the City of Winnipeg and the Manitoba Department of Environment.

The City of Winnipeg is always looking at new technology in biosolids processing and, at some future time, it is possible that further processing, such as drying of the biosolids, will be done. For the present, the City is proud of the WINGRO program because, as the logo suggests, a waste product is being recycled as a resource for the agricultural community. □



Centrifuge powered by a 200-h.p. motor operating at 2400 rpm.

1995 Annual General Meeting

(Cont'd from page 7)

up of 10,000 men and women engineers from across Canada, was taken, in part, to collect comprehensive data on workplace experiences of engineers. Some results indicated that more than 75% of engineers are satisfied with their jobs, their choice of engineering as a career, and their advancement prospects. Attitudinal barriers in the workplace have decreased, but still cause a problem for many women. For further results of this national survey, copies are available, at a cost of $25. Please contact WEAC.

By-Laws

There were a couple of notable proposed changes to the By-Laws and much discussion was centered around the Duties of the Investigation Committee, By-law 43.4.7. The proposed wording, it was argued, maybe construed as a form of "muzzling". Council emphasized that this was not the intent – that Council wished to "monitor" such activity between the complainant and the member who made the complaint.

Presentation

Don Osman turned over the Presidency to Cathy Stewart with the official signing of the gavel. In her speech, Cathy expressed her thoughts on her new appointment, using, in part, a quote from Thomas Edison: "The road to success is usually dressed in overalls and therefore looks like too much hard work". The road, I imagine, will be long, but hopefully it will not leave "two ends" much like the "sausage". So ended the 76th Annual General Meeting. □

Engineers in the News

Dr. Slobodan Simonovic, P.Eng., was awarded the Graduate Student's Association Award for Excellence in Graduate Student Teaching at the 29th Annual University of Manitoba Fall Convocation in October.

Dr. Simonovic teaches graduate courses in water resources intelligent decision support, water resources systems and advanced civil-engineering systems analysis, while his primary research is on modelling and optimizing water-resource systems.

Accountability With an Attitude

By: J. Lucas, P.Eng.

Taking the lead from Bill Gates and his Windows '95 rollout, music by the Rolling Stones was the backdrop for the Annual General Meeting Accountability Session which covered four very diverse and interrelated topics.

Manitoba Law Reform Commission's Report

Ron Britton presented a very lively discussion of the Manitoba Law Reform Commission's Report. Having waded through portions of this report myself, I was quite impressed as to the level of energy inspired in the meeting by Ron's evaluations.

The distributed summary report was supported with a high-tech multi-media presentation and covered the potential impact of the Report on the Engineering profession in Manitoba. Of course, along with Engineering, another 155 occupational groups and services are included in the study which shows the extent that this Report can influence the future of working groups in the Province.

The 1994 study included 90 separate recommendations ranging from defining "task-based" models to proposing the creation of an "entity, operating at arm's length from the government" to administer all regulated professions and trades within the province. Truly far reaching programs; however, Dr. Britton noted that the APEM complies with about 80 of the 90 points. The remaining 10 recommendations may be unworkable or even detrimental. One area of serious concern in the "arm's length" entity.

Dr. Britton reported that there appears to be a will within the Government to enact these recommendations. The ad-hoc Committee of Council is actively developing a position paper on behalf of APEM and all members are encouraged to review the Report and provide their comments to the committee.

Proposal regarding Mandatory Reporting of Professional Development (PD)

Mike DeWiele of the PD committee gave a highly mobile talk on the proposal to move towards the mandatory reporting of professional development by all APEM members.

The present system of self-regulation may or may not be totally effective and many advantages can be offered by an Association-monitored system:

- Duty & ethics – self-development is basic to an engineer's duty and ethical responsibility.
- Benchmarking – offers a means of judging personal effort in developing competence.
- Transferability – PD is becoming mandatory in other areas which will make personal reporting a basic requirement for registration transfers.
- Self-regulation – The Law Reform Commission Report discusses continuing competence which suggests government-mandated PD.

The means, methods and measurement of PD are areas still under discussion by the PD Committee, and members' comments/questions on any aspect of this initiative are eagerly requested.

Proposed Revisions to The Engineering Profession Act

Don Spangelo, armed with a single sheet of paper, gave the day's lowest-tech presentation which covered the proposed changes to the Act.

It has been proposed that our new act be titled The Engineering and Geoscientific Professions Act. The main impetus was to provide for Group Practice Licensing and can include the potential revisions required by the results of the ongoing discussions with Natural Scientists Societies of Canada.

Don noted that it is important to remember that only the Legislature can change the Act and changes to the Act and changes to the Association's proposal are quite possible. Combined with the Law Reform Commission Report, it is uncertain how the proposal will be received and how the process will develop.

Committee and general membership discussions will continue with more formal consultation planned for the 1996 AGM. *Continued on page 12*

Professional Development Committee

Breakfast Meeting – October 26, 1995

WINNPORT – The Winnipeg Transportation Hub

By: P.C.H. Wong, EIT

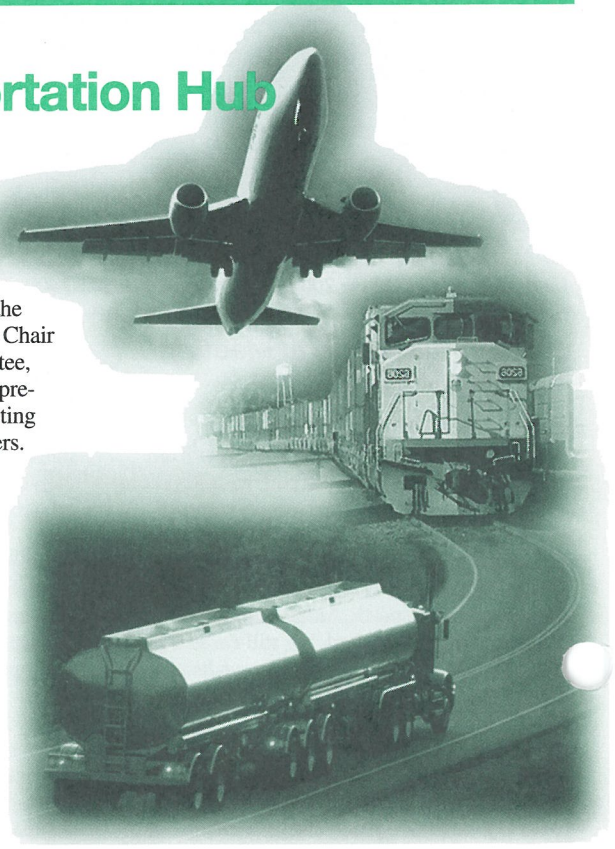
The Professional Development Committee held a Breakfast Meeting on October 26, 1995. The guest speaker was Murray Brown, Manager, Research, Winnport Logistics Ltd. Mr. Brown has many years of experience in the railway industry. He spoke on a plan to develop an international centre for air and truck cargo distribution based out of the Winnipeg International Airport.

The presentation discussed the results of studies and the economic feasibility of the centre along with the action plan to establish it. The numbers from the studies as well as the realistic ambitions of Winnport were convincing that this will become a reality in the near future. The presentation also highlighted the existence of opportunities to provide logistics and value-added distribution services.

The speaker described Winnport as a partnership of large businesses with established international distribution networks and expertise in air cargo, road freight, electronic commerce and finance. The background to the formation of Winnport was also presented.

Mr. Brown then answered questions from the audience. The audience asked why Winnipeg was chosen over other North American cities or towns, what the challenges are to this development, what the start-up costs will be, etc. Doug Kramble, Chair of the Professional Development Committee, then thanked Mr. Brown for his excellent presentation. This was a very interesting meeting which even attracted many young engineers. There was a shortage of brochures due to a much greater-than-anticipated number of attendees. The speaker was kind enough to mail out brochures to those who left their business cards.

It is quite encouraging to see the building of business partnerships among forward-looking companies that recognize global industry trends and opportunities to develop integrated, time-definite cargo services and value-added activities based in Winnipeg. This will definitely have a positive impact on our local economy. □



Department of Civil and Geological Engineering, University of Manitoba

SuperpaveT Asphalt Laboratory – Petroleum Technology

By: E.A. Speers, P.Eng.

A SuperpaveT Asphalt Test Facility has been established and is now open at the University of Manitoba through the joint efforts of the Department of Highways of the Province of Manitoba and the University's Department of Civil and Geological Engineering. This facility is a direct result of Canada joining with the USA Strategic Highway Research Program (SHRP) by establishing its own Canadian complement, the C-SHRP (US SHRP) program. The US SHRP was a $250 million research effort, with the asphalt-research phase of the program resulting in the establishment of "performance specifications" as the criteria for quality control and acceptance of asphalt pavements; that is, replacing the old empirical/experience-based testing with a new analytical/performance-based "Superpave" system.

The need and importance of this research is obvious when we consider the estimated $75 billion capital investment in the Canadian Road Infrastructure with an annual maintenance cost of about $12 billion. Much of this maintenance work is directly related to asphaltic materials.

The new "Superpave" testing system consists of two main sub-testing systems. The first sub-system deals with the testing, evaluation and ranking of the asphalt binder, designed to provide pavement engineers and researchers with reliable test data that can be used to quantify the engineering and physical properties of the binder. This sub-system is now up and running in our laboratory, with 25 different tests, protocols and services, including:

- Dynamic Shear Rheometer Test and Grading at High and Intermediate Temperatures
- Bending Beam Rheometer Test and Grading
- Physical Hardening Test with Bending Beam Rheometer
- Direct Tension Test and Grading
- Aging in Pressure-Aging Vessel (PAV)
- SHRP Superpave Binder Grading (with and without direct tension test)
- SHRP Superpave Binder Verification (with and without direct tension test)
- Blending of Asphalt Cement and Polymer
- Breakdown of large samples for testing
- Penetration Test
- Kinematic Viscosity (AASHTO T 201)
- Viscosity (AASHTO T 202)
- Broodfield Viscosity
- Ring-and-Ball Softening Point
- Thin-Film Oven Test
- Specific Gravity
- Flash Point (Cleveland Open Cup)

The second sub-system of the "Superpave" test facility deals with the asphalt binder mixed with aggregate. The main objective of this sub-system is to determine the values of critical parameters required for the design and maintenance of the asphalt road. These parameters include: fatigue performance, rutting and stripping resistances, and effects of low temperature on the structural behavior of the asphalt mixtures. This sub-system is planned to be the next to be installed.

Further details can be obtained by contacting Ted Speers, Ph.D., P.Eng., Director at (204) 837-3492 or Fax (204) 897-0973. □

First Red River Community College Honorary Diploma Awarded to Prominent Manitoba Engineer

By: W.G. McKay, P.Eng. (Ret.)

On June 20, 1995, Mr. Lloyd McGinnis, P. Eng., Chairman and Chief Executive Officer of Wardrop Engineering Inc., became the first recipient of an Honorary Diploma from the Red River Community College.

Lloyd's involvement in the engineering field locally, nationally and internationally is well known. He has received awards of national recognition for his service to the profession and to the community, including the 1986 CCPE Gold Medal as Canada's Outstanding Engineer, and recently, the United Nations Global Citizen Award.

However, perhaps not so well known is his involvement with the engineering technicians and technologists. He has always had a strong appreciation for the services that these graduates have provided to professional engineers, especially in the field of consulting engineering.

While on APEM Council, he was involved in the formation of MANSCETT. For many years, he has spoken to the students at the college. He also initiated a scholarship in his own name for student competition. Recently, this scholarship was re-named as the Wardrop Engineering Scholarship. It is presented to a student in engineering technology who has displayed the greatest proficiency in oral and written communications. Also, in lieu of receiving a gift for his recent chairmanship in the Chamber of Commerce, he had them make a donation to the College and a student in Electrical Engineering Technology received some unexpected financial support.

Lloyd indicated that the honorary diploma award was totally unexpected. However, his long-standing affiliation with the college certainly makes him a most deserving recipient. □

University of Manitoba Expertise hits the Highway

By: D.R. Strang, P.Eng.



University of Manitoba expertise has hit the information highway. The newly-formed Industry Liaison Office is co-ordinating development of a database of expertise that can be accessed at a "web site" maintained by a company called Community of Science. A web site, for the uninitiated, is a collection of information in electronic form accessible through the now-ubiquitous Internet.

University of Manitoba data resides on a single web server, along with information from over 100 other universities throughout North America. The physical location of the server is in Baltimore, Maryland, but that fact is transparent to the user. It is as easy to use as if the data were maintained on a computer located in the same room as the user (see IEEE Conference Features Communications Innovations, MPE, August 1995).

To take advantage of the system, researchers are encouraged to enter information on their work in progress, research interests, expertise, and past accomplishments. By listing their capabilities in a common, first-person format, participating researchers can benefit from exposure to colleagues and funding agencies. Additionally, the listings are used to publish expertise directories and identify target researchers for grant information, industrial contracts, seminars and media requests.

The database provides a common format for data on researchers throughout North America and is regularly searched through the World Wide Web (WWW) by universities and corporations. The expertise database is one of the tools used by the University of Manitoba's Industry Liaison Office, which actively promotes collaboration with industry. Manitoba corporations interested in more information on University of Manitoba capabilities can contact Doug Strang by phone, at 474-6689, e-mail doug_strang@umanitoba.ca. □

Adopt a School

By: V.L. Dutton, P.Eng.

I do not remember which Committee recommended that every engineer "adopt" a school. The idea was to help with Science Fairs and in such other ways as the engineer's interests and abilities would lead. It turned out to be easier than I thought, since our schools already make extensive use of volunteers. I chose Frontenac Elementary because I can walk to it and aging warriors need the exercise.

The teacher who will become your mentor has to appraise you. As I happen to be an amateur-radio hobbyist, I used this as my first selling point. A couple of sessions with the Grade 8 classes, dealing with aspects of electronics, opened the door for me.

Since then, I have done aspects of reflection and refraction with a Grade 7 class, tried an after-school program, helped build bird- and bat-houses, and helped with a mathematics-enhancement "course" for some Grade 8 students last winter.

Last year I suggested that some of the Grade 7 students might like to try making their own crystal-radio set. Andy Bell, the vice-principal and my mentor, suggested we open it to the Grade 6 students, too. To my surprise, they were the ones who grabbed this activity. With help from Gil, VE4AG, and Caroline, VE4CAR, 14 radios were built, complete with an amplifier circuit and a small speaker, all mounted in a case the students built from the ends of grape-boxes from the IGA. We are repeating this activity this year, and taking the "seniors" on into other aspects of radio and electronics. It is our objective to prepare them to write their examinations for their amateur-radio licences by the end of Grade 8. It is satisfying to find that the two girls from last winter are continuing and that three more Grade 6 girls have joined us.

With the coming of Spring, I instituted a Weed-A-Week activity with a Grade 3 class, thanks to having developed a rapport with their teacher. This took about twenty minutes each week. I happen to have some winter onions, and a hen-and-chicks plant, in my garden so I was able to give each child things to plant, which thrilled them. Connie reported that, on a walk with her class following the session where I had introduced them to the pineapple weed, the kids found some for themselves and were delighted with their discovery.

Having graduated at a time when Civils took Astronomy, I have always had a bit of an interest in the subject. Frontenac's "observatory" is a basic one consisting of a tether-ball post surrounded by an expanse of tarmacadam. Using the pole as the gnomon, we have established the school's meridian. The sun's declination lines for the summer solstice, the equinoxes, and a day in November have also been painted on the tarmac. If you cannot figure out how these lines curve throughout the year, why not pay us a visit to see for yourself?

Another project in day-time Astronomy is now being developed. The purpose is to estimate the radius of the Earth using the method employed by Eratosthenes some two centuries ago. The method requires two observation points on, essentially, the same meridian and some distance apart. We hope to make this a multi-school activity involving the Grade 7 classes at Emerson, Rossville, and Churchill since these schools are close to Frontenac's meridian. (Yes, we will be introducing our young astronomers to the estimating of errors.)

Does a project like this make sense? Since Astronomy is one of the subjects covered in Grade 7, we believe it does. Certainly linking schools in such a project will help develop an appreciation of science as history as well as emphasizing co-operation between scientists. We are hoping to be able to work up a display of this project for the Manitoba Schools Science Symposium next May. It would also be nice to have some of the students from our out-of-town partner-schools stay with us for that weekend. Look for us at the University of Winnipeg in May!

Here are a few things that might be helpful when you approach your own school:

1. Our teachers are hard-working and their judgement and advice are important. You will be there to help, not hinder, them.
2. In spite of what one might conclude from reading our newspapers, our children are great kids. Yes, Frontenac has its fair share of "troubled" children, invariably due to the stupidity of parents and grand-parents from what I can see.
3. After-school meetings do not work. The kids want out to work off their energy. We meet with the Radio Club during their noon-hour once each week.
4. Be prepared for a certain amount of conflict with the school's athletic programs. These events are important to the kids who are, after all, still busy sampling the many activities that lie before them.
5. Be prepared to encounter a certain number of "easy starters" who will not be with you at the end of the term.
6. Money is always a consideration and electrical components carry a cost. However, the kids seemed to have lots of it when the local Community Club held its Fair last June. Our activities cost from $20 to $25 for the winter.
7. Should you ever want to try the Crystal Radio activity, WARC (the Winnipeg Amateur Radio Club) and the Winnipeg Seniors' Radio Club have many members who are retired and waiting to be asked.
8. If things go as well for you as they have for me, there will not be enough hours in your week to do all the things that a science-supporter could be doing in a school.
9. You will never regret becoming a science-supporter at your local school. □

Accountability with an Attitude

(Cont'd from page 10)

Women in Engineering Advisory Committee Survey on Workplace Conditions

Carol Roberts began her presentation with a surprise quiz that I failed rather badly (but was close on the left-handed question).

Moving quickly to make us right-handed members feel a bit better, Carol outlined the results of the National Survey of Workplace Conditions for Engineers. The survey was undertaken to gather comprehensive and current data on the workplace experiences of engineers.

Results, based on a 31% survey return, provided useful and interesting data:

- 80% of engineers are satisfied with their careers and 75% with their jobs.
- male and female engineers agree on the attributes as keys to success. Long hours were accepted as necessary to career success.
- inequities identified as barriers to success included salary and promotions to management.
- experiences of gender-related attitudinal barriers in the workplace have decreased, but are still a problem for many women.
- a majority of respondents favour inclusion of sexual harassment as an infringement of the Code of Ethics.

Ms. Roberts noted that the Engineering profession is not unique with respect to gender-related challenges and that on-going efforts are producing positive results. Further work is necessary to ensure that no artificial barriers exist for any group or individual. School outreach efforts and support of female-accessible math and science programs are both positive initiatives with valuable results, and Carol challenged the membership to develop the means to meet the needs. □

Coming Events

Engineering Student-Night Dinner

Thursday, February 22, 1996

Hotel Fort Garry

18:00 – Cash Bar – Mezzanine Floor

19:00 – Dinner – Provencher Room

Host a student and enjoy an evening with tomorrow's engineers. Mark the date; you will be contacted.

Engineering Management Seminar

"Electronic Business Management"

February 22, 1996

Norwood Hotel

Further details will be provided in the next general mailing. Presented by the APEM Professional Development Committee.