THE MANITOBA

Professional Engineer

ASSOCIATION OF PROFESSIONAL ENGINEERS OF THE PROVINCE OF MANITOBA

February, 1990

# ENGINEERING FOR CLIMATE CHANGE

*Alan W. Scarth, Q.C.*

The central question about climate change is subtly shifting from "whether" to "when". There cannot be many examples of a theory, such as the Greenhouse Effect, finding scientific consensus in a few short years without undisputed, measurable evidence on the ground. That this has happened tells us something about the seriousness of the implications, and about the efficiency of communication between modern scientists.

Climate-change scientists (this is now an identifiable discipline) come from diverse backgrounds, and work in many different areas of biospheric research. There are, of course, climatologists in the discipline. But there are also marine biologists, who are knowledgeable about such things as carbon absorption by organisms in the sea; agronomists, who can predict the interaction of plant growth with heat and moisture; hydrologists, who can relate the distribution of surface and subsurface water to variables of precipitation and evaporation; foresters, who calculate the increase in boreal forest fires and consequent exacerbation of the Greenhouse Effect; and a host of others whose business it is to measure biospheric impacts.

The motley and diverse character of the climate-change discipline is logical, given that the Greenhouse Effect will reach into every nook and cranny of the biosphere and, in the process, of man's activities. What is unprecedented is that these scientists have coalesced in a few short years to produce a working theory which finds widespread consensus about the mechanism of the Greenhouse Effect, if not yet about its effects on the ground, where engineers practice their profession.

With Stephen Hawking we can "take the simple-minded view that a (scientific) theory is just a model of the universe, or a restricted part of it, and a set of rules that relate quantities in the model to observations that we make. A theory is a good theory if it satisfies two requirements: it must accurately describe a large class of observations on the basis of a model that contains only a few arbitrary elements, and it must make definite predictions about the results of future observations." The Greenhouse theory is still somewhat weak on both counts. But, like Tiny Tim, it's getting stronger every day.

The rapidity with which the Greenhouse theory was developed has been fueled by a growing realization of its devastating implications. One scientist describes his personal "horror" when he sat back and thought about the figures on his computer screen. But this rapid development was only made possible by a communications system which links scientists in their offices and homes by computer and fax as effectively as if they were together in one of the last-generation scientific institutions; perhaps more effectively, since the requirement to convert concepts to expression capable of electronic transmission concentrates the mind wonderfully, and is in many ways more effective than talk.

Because what we might call the causative mechanism of the Greenhouse Effect has understandably preoccupied climate change scientists, the extension of the network to those whose professions and enterprises will be impacted by the Greenhouse Effect is only now being undertaken. In June of 1989, the Partnership for Sustainable Development, based in Winnipeg, pioneered this extension of information and discussion by inviting a dozen senior executives of major industries in the North American Great Plains Region to meet an equivalent number of climate-change scientists of world stature. The 3-day meeting was held at a remote resort on Lake Winnipeg, and no media or publicity were invited. The purposes of this first meeting were limited and focused: to make business executives aware of the Greenhouse theory and of the degree of probability of occurrence of the effects which the theory predicts; and to make the scientists aware of the nature of the predictions which executives will need in order to factor in the Greenhouse Effect when they make investment decisions. Within these parameters the meeting worked, once each side understood where the other was coming from.

## Where do engineers figure in all this?

Until now, climate variables which have been factored into development plans have been extrapolations of historical data. Examples are the last-generation dams constructed for irrigation or for waterfowl production on the Great Plains. Given historical average precipitation, ice cover and other evaporative conditions, these dams produced acceptable cost/benefit ratios. Some of these dams are still being built, on a "preparing for the last war" basis.

Engineers in the 1990's will be asking the climate change scientists for finer resolution models predicting temperature and moisture regimes on the Great Plains before exposing substantial new areas of surface water to potential evaporation loss. Engineers with experience of the critical factors affecting maintenance of water levels in water bodies and wetlands in the North American Great Plains will be instantly alerted by the prediction that this water will be without ice cover for significantly longer periods. In layman's terms, the essential difference between a desert and a dry but productive prairie may simply be winter temperatures cold enough to keep the prairie from drying up.

***Engineers are, of course, on both sides of the table. They are part of the climate-change discipline and, as officers of private sector and public sector corporations undertaking major developments, they are consumers of the predictive data supplied by that discipline.***

These finer resolution models may demonstrate that dams built on last-generation information will serve only to expose a critical water resource to increased evaporation: that reservoirs will never achieve effective levels for significant periods; and that the cost/benefit ratio will not justify the investment.

In the 1990's, the only thing that we can be certain about is change. If the climate-change scientists are right, that change, both in degree and rapidity, will be the greatest mankind has ever faced. The engineering profession will bear a substantial responsibility for the effectiveness of our response.

And to respond, the profession will, above all, need information on climate-change, and this the Partnership for Sustainable Development means to provide. □

*Alan W. Scarth, Q.C., is a partner in the legal firm of Thompson Dorfman Sweatman in Winnipeg, and a founding member of the Partnership for Sustainable Development.*

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## — Notice —

***Annual Fees Important Reminder***

Fee invoices have been mailed to all members. Members are again reminded that receipt of fees in the Association office after February 28th, 1990 will incur a late payment administration fee of $45.00. If fees are mailed prior to February 28th, and received after February 28th, the late payment fee will apply.

Also, be reminded that if all fees owing are not received in the Association office before July 1st, 1990 the member's name will be removed from the register and that person is then prohibited, by law, from practising engineering in Manitoba.

### WITH DEEP REGRET THE ASSOCIATION RECORDS THE PASSING OF:

Connolly, C.J. Poyser, L.E.
Williams, R.S. - *Life Member*

# Career Mentor Program at U of M

*by Pamela LeBoldus*

Will you be a mentor?

As a student, did you ever wish you had someone to talk to about your career goals?

The Student Affairs Counselling Service and the Alumni Association of the University of Manitoba are co-sponsoring a pilot project called the Career Mentor Program. It is designed to link students in the faculties of Engineering and Arts with a member of the community who has volunteered to share information about his/her occupation.

The program came about as the result of a survey conducted by Student Affairs last year which showed that university students are particularly career-focussed. However, frequently they have no opportunity to learn about the range of careers available to them or about the existing job market. Mentors are not expected to provide academic advice, only the wisdom of their own occupational experience. Convenient times will be arranged as requested.

On-campus marketing to students has just beg so a prediction as to the numbers, who will regis for the program initially, is unavailable at this time. The counselling service is expecting, however, to assign the first group of students to mentors by the end of February.

If you have time to help a student plan a career path, your participation would greatly appreciated. This project is unique in Canada. It has great potential. Please feel free to call the University of Manitoba Counselling Service at 474-8592 for more information.

# Iron Ring Ceremony

The Spring Iron Ring Ceremony will be held on Tuesday, March 13 in Tache Hall, U of M Campus. The ceremony will commence at 8 p.m.

Those seeking additional information regarding the ceremony or the obligaiton of an engineer may contact the secretary, Dave Sexton at 945-7488.

### LICENCES ISSUED IN DECEMBER '89 AND JANUARY '90

N.A. Brais (Que.)
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P.F. Da Silva (Ont.)
A.W.J. Dolhaine (Alta.)
J.C. Draper (Que.)
T.K. Eng (Alta.)
K.K. Ghosh (Ont.)
S.F.M. Jim (Ont.)
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### 100% ON THE PROFESSIONAL PRACTICE EXAM

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Buelow, A.F.
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Davis, J.H.
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Gold, J.E.
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**Can We Have An Address?**

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Zahn, M.L.
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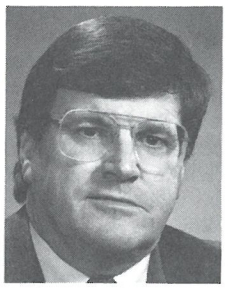
## President's Message

K. A Buhr, P. Eng.



# A "New" Definition of the Practice of Engineering

Statutes relating to the practice of engineering must, perforce, include a definition of what constitutes the practice. Without such a definition the statutes would provide no means of regulating or governing the practice.

Considerable effort and time is being spent both at the local and the national level to come up with an acceptable and accurate definition which relates to the many pertinent changes taking place in the field of engineering. More and more engineers are taking on managerial roles as compared to technical roles. New areas of technology, which may or may not fall under the definition of the practice of engineering, are being developed every year. There is continuing debate on whether or not the teaching of engineering is the practice of engineering. Technologists are pressing for a recognized scope of practice as distinct from the practice of engineering.

In addition to the above, the need for a more "realistic" definition for the practice of engineering is paramount since the prime mandate (and, some might argue, the sole mandate) of our Association is to regulate the practice of engineering in the Province of Manitoba. A corollary to this is the potential problem of prosecuting individuals accused of practicing engineering illegally if the practice is not clearly defined in the Act.

At first glance, defining the practice of engineering appears not to be a very onerous task. Why then are there as many definitions in Canada as there are provinces and territories? Why then has CCPE not been able to obtain consensus on a common definition despite efforts dating back to the early 1970's? As late as November of 1989 a CCPE workshop, set up to produce a common definition of engineering, came up with as many definitions as there were sub-groups and could only agree to reduce them to two general definitions.

The current definitions in Provincial Statutes across the country do have some common elements. Most stress the application of scientific and engineering principles and the acts of designing, evaluating and reporting, etc. More recently, some include the teaching of engineering. In addition, many of the current definitions contain what is referred to as a "laundry list" which is a list of disciplines which are considered by the provincial Association to constitute the practice of engineering. Such definitions are termed "exhaustive" in that they define the scope of professional activity exhaustively.

The Manitoba definition would be considered an exhaustive definition. It reads as follows:

"practice of professional engineering" or "practice of engineering" means the carrying on for hire, gain, or hope of reward, either directly or indirectly, of one or more of the following branches of the science of engineering, namely:

(i) agricultural,
(ii) biomedical,
(iii) chemical,
(iv) civil,
(v) electrical,
(vi) forest,
(vii) geological,
(viii) industrial,
(ix) mechanical,
(x) metallurgical,
(xi) mining, or
(xii) structural,

or such other branch as hereafter may be recognized and adopted by by-law of the Association as a branch of engineering and, without restricting the generality of the foregoing, includes the reporting on, advising on, valuing of, measuring for, layout out of, designing of, engineering inspection of (including the direction or supervision of any of the foregoing) or the construction, alteration, improvement or enlargement of, works or processes or any of them by reason of their requiring in connection with any of the operations above set forth, the skilled or professional application of principles of mathematics, physics, mechanics, aeronautics, hydraulics, electricity, forestry, chemistry, geology, or metallurgy, but does not include the operation, execution or supervision of works as superintendent, foreman, inspector, roadmaster, brickmaster, building master or contractor, where the works have been designed by and are constructed under the supervision of a professional engineer.

Definitions may be "expansive" in that the scope of the practice of engineering is not specifically defined. For example, the latest definition in the Ontario Act reads: - "the practice of professional engineering means any act of designing, composing, evaluating, advising, reporting, directing or supervising wherein the safeguarding of life, health, property or the public welfare is concerned and that requires the application of engineering principles, but does not include practicing as a natural scientist."

As noted earlier, at a recent CCPE meeting in Ottawa a workshop attempted to agree on a definition of the practice of engineering, keeping in mind that the definition should be broad enough to encompass the management and the application of technology, distinguish between engineering work and the practice of professional engineering, shift the emphasis in the job function toward management of technology and finally, expand the notion of protection of the public. Using these criteria, the workshop proposed the following definitions:

1) the practice of professional engineering is the application of scientific principles and technical knowledge in practical pursuits to the benefit of the public with integrity and responsibility.

2) the practice of engineering is the application of intellectual thought and engineering principles, and scientific engineering and judgement, by virtue of specialized education and training in the interpretation, analysis and solution of engineering problems. Without restricting the generality of the above, it includes reporting, advising, valuing, measuring, layout, designing, etc., and will involve responsibility for the engineering and judgement in the safeguarding of life, health, property and public welfare.

There was no unanimity within the workshop that either definition would be acceptable to all participants. A CCPE Committee on Professional Issues will consider the definitions produced by the workshop and the content of the discussions and attempt to come up with a proposed common definition for consideration by all provincial Associations.

As we can see, defining the practice of professional engineering has a long way to go before any common definition can be arrived at. However, it is hoped that individual prejudices will take a back seat to finding a definition which is not confusing to the public, let alone the professional engineer. Such a definition would go a long way toward settling jurisdictional disputes, defining the roles of technologists and engineers and helping to clarify the engineer's role in safeguarding the public welfare.

# APEM Videos

The Public Relations Committee has the following videos recorded at breakfast meetings available for loan to APEM members. These are available at the APEM office.

**Videos**

1. APEM - What Can It Do For Me?
   - W.B. Mackenzie, P. Eng., March 8, 1988.
2. Continuing Education for Professional Engineers
   - Peter Van Vliet, Vice President E.I.C., May 17, 1988.
3. Free Trade - The Impact on Engineers
   - Russell Hood, P. Eng., September 14, 1988.
4. The Future of Engineering
   - Dr. Philip Lapp, P. Eng., October 28, 1988.
5. The Problems Relating to the Legal Liability of Engineers
   - October 28, 1988: Panel Discussion.
6. Trends in Engineering Education
   - Glenn Morris, P. Eng., November 30, 1988.
7. The Art of Leadership
   - Lloyd McGinnis, P.Eng., April 12, 1989.

**Produced by other organizations which are available**

8. Ethics on Trial - The Case of Marvin L. Camper
   - American Society of Civil Engineers.
9. It's Up To You - Careers in Engineering, Geology and Geophysics: APEGGA.
10. Shaping The Future - APEBC.
11. Truesteel Affair - APEO.
12. The Invisible Profession - APEO.
13. To Engineer is Human - B.B.C. Education and Training

# Chemical Engineering and Canada's First rDNA Pilot-Plant

*by V. L. Dutton, P. Eng.*

rDNA is the acronym for recombinant deoxyribonucleic acid. According to a recent news item, one of the questions asked of high-school students when testing them for their level of scientific understanding was to give the name of the chemical represented by DNA. Now you know it too - except for the "recombinant" part.

In the 1970's, biologists who are interested in such things, learned how to join the different types of DNA in a technique known as "gene splicing"; it is the results from this technique that will be produced in the rDNA pilot-plant at ABI Biotechnology. To those accustomed to splicing lumber with finger-joints, it should be noted that gene splicing is a chemical process and the rDNA laboratory is a pipe-fitter's dream.

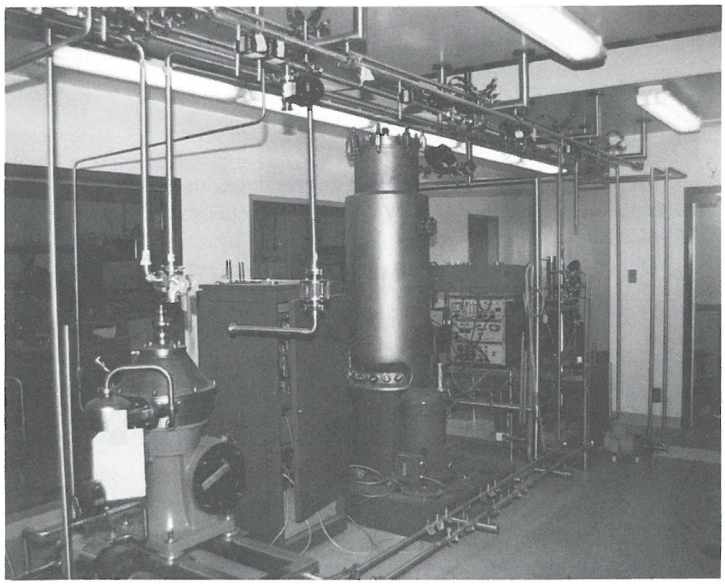
Our bodies contain about 10E11 cells. Within each cell are molecules, called proteins, that determine the structure and function of each cell. In addition to the proteins in each cell, there is a nucleus in which there are 23 pairs of chromosomes. Every cell in our bodies contains identical copies of these chromosomes. Each chromosome consists of two long, twisted strands of DNA, the chemical that carries genetic information from parents to offspring. Human DNA is divided into about 100,000 clusters called genes. With this vast number of genes, perhaps it is not surprising that some people have one or more missing or malfunctioning genes in their bodies. The genes act like blueprints; "coding" for the manufacture (biosynthesis) of specific products.

One example of a useful rDNA product is human growth hormone (HGH). Pituitary dwarfism is caused by the underproduction of growth hormone in the pituitary gland of the brain, as the result of a malfunction in the genetic apparatus. The Animal Science Department at the University of Manitoba, encountered this phenomenon a number of years ago, when they started crossing some breeds of cattle. Basketball coaches, of course, are looking for young men and women whose genetic apparatus malfunctions by overproducing growth hormone.

Until the present time, human growth hormone has been extracted from the pituitary gland of cadavers - a slow and costly process with a limited supply. Using genetic engineering, the DNA coding for human growth hormone is spliced into the DNA of a bacterium, resulting in rDNA. The rapidly-multiplying rDNA bacteria can be cultured indefinitely; thus providing a readily available, unlimited supply of HGH for the treatment of pituitary dwarfism.

Although human growth hormone is not one of them, rDNA products will be processed at the ABI Biotechnology Pilot-Plant. rDNA work is the realm of the genetic engineer (scientist), but producing the results on a large scale is the realm of the chemical engineer. In this case, the design of the system was produced by Roshni Dutton, EIT. It was she who showed me through the pilot-plant - and just in time, too, as the final pieces of equipment were being installed and, with that done, the pilot-plant will be "off limits" to all but the appropriate workers because of the importance of cleanliness in the pilot-plant.

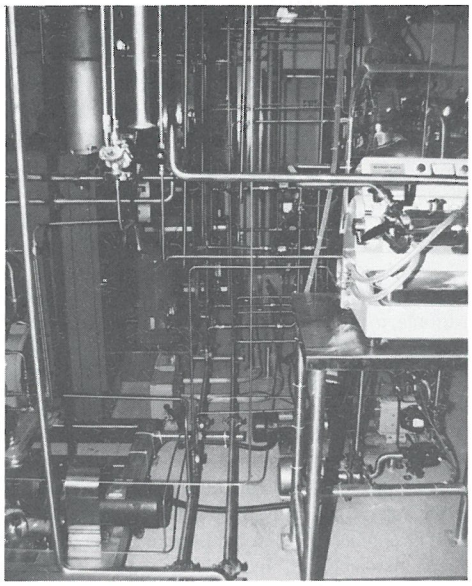
The pilot-plant is kept at a negative pressure in order to keep in the rDNA organisms. Entrance to the plot-plant is through an air-lock/cum wash-up and gowning room with interlocked doors. This precaution, together with air filters, helps to keep dust out of the clean environment of the pilot-plant. From experiences with the furnace in your house, you will appreciate that filters, and their maintenance, are an important part of operating this facility.



*Left to right: The 20l fermentor, the 200l fermentor and the centrifuge (front view).*
*- Pumps for the centrifuge, not yet installed, lie on the floor in front to the 200l fermentor.*
*- About 1/3 of the way through installation.*

The pilot-plant is about 12m x 6m in plan with an adjacent utilities room 6m x 6m; both spaces opening into the building's receiving bay.

The two rooms are connected only by a pass-through autoclave with double bio-sealed doors. Normally, the pilot-plant's service doors will be sealed. Similarly, the windows, that look into the receiving bay, have been designed without sills so as to avoid collecting dust. Even the light fixtures and the wall-outlets have been specially designed to eliminate the possibility of air transfer (and contaminants) in or out of the pilot-plant. Most impressive, but the purpose of this article is to give an "overview", so I shall say no more about the ventilating system nor about the finishes on the ceiling and wall which are a housekeeper's delight. The floor is also specially designed to be easily cleaned. There is a raised curb, as a part of this flooring system, to contain any spills should they develop.



*A maze of piping, the pilot plant nears completion.*
*- homogenizer at right.*
*- edge of centrifuge in left foreground.*
*- 350l processing/harvest tank right background.*
*- 200l fermentor left background.*

We next looked at the process line itself - a glistening array of stainless-steel tanks and piping. Beautiful! Because the "clean" and "pure" waters that are used in various phases of the process are extremely good solvents and, hence, highly corrosive, 316L stainless steel is used throughout. The L denotes a low carbon content in the alloy which helps to reduce corrosion of the metal. The closed-loop process line is held at a positive pressure to keep contaminants out of the product.

Through the windows to the receiving bay, I could see two welders busy with the last of the assembly work. These men come from eastern Canada. Specialising in the sanitary welding of stainless steel, they travel around the world from job to job as befits specialists. They are rated amongst the top ten sanitary welders in North America. I didn't inquire about their rates of pay but Roshni showed me some of their welds and I quickly concluded that these men were worthy of their loonies.

The process uses, essentially, four unit operations - a fermentor, a holding/processing tank, a homogenizer, and a centrifuge - all imported, of course. In spite of its name, the fermentor is not used for making alcohol; it is simply the vessel in which the bacteria are grown. The holding tank is used for adjusting pH levels and for adding solvent at various steps in the process. The centrifuge is used to separate solids from liquids - again at various points in the process. The homogenizer is used to break apart the bacteria cells, thereby releasing the product which is contained within them.

Continued on page 11

# Wanted: More Women in Engineering

*Garland E. Laliberte, P.Eng., Dean of Engineering, University of Manitoba*

It is morally and even ethically wrong to exclude women from engineering. Not that most of us men in the profession deliberately exclude women. However, our actions in condoning subtle and even blatant forms of gender discrimination and our inaction in not making engineering a more inviting career for women are no longer acceptable. On purely academic, sociological and physiological grounds, women are as well equipped as men to practise engineering, even though there may be differences in their approaches to work and to study.

Many studies have been undertaken to determine whether there are differences between men and women in their abilities to grasp the high school academic subjects that underpin engineering – mathematics, physics and chemistry. While differences have been observed, not a single study has demonstrated clear unequivocal proof that there are intrinsic differences, only those that are socially taught and environmentally reinforced. And of course, these differences may manifest themselves in varying degrees, or even not at all, among individuals. On another front, women tend to be better in languages acquisition, including English. Again, there is no conclusive evidence that this is any more than an environmentally cultivated phenomenon.

Even if there are differences in left brain/right brain development of women and men, reinforced by social patterns, these differences should be seen as an asset to be utilized to the benefit of the profession rather than a liability and a basis to exclude half the population or even to apathetically accept their non-participation. Wouldn't it be an advantage if engineering decisions took on an enhanced qualitative dimension as an enrichment to the numerical approach that is central to many, if not most, present engineering solutions? And, if because of conditioned differences, women are generally better at communication, why not capitalize on that difference to bring a new vigour into our profession instead of excluding it?

When it comes to physiological differences, my question is: "Does it really matter?" How many of us rely on brute strength in our professional endeavours? Have we not decried the all too frequent stereotypical portrayal of engineers as hard-hatted males with the implication that engineering life is a physical life. Not that construction supervision isn't an important part of the profession. The painting of our profession in this way gives an unfortunate one-sided impression of what engineering is all about. A good friend of mine is a civil engineer in charge of design and the inspection and contract supervision of marine structures for Public Works Canada. She weighs, I'm sure, less than 50 kilograms. She has no trouble dealing with the rigours of the workplace. In fact, if she doesn't spend very many years in this role, it will only be because she is on a fast track to management.

If you are not convinced by the academic/ sociological/ physiological argument for the encouragement of women into the profession, there is also a compelling economic one. Consider this set of facts.

1. A study entitled "The Demand for Engineers in Canada: Estimates of Requirements 1987 to 2000" was released in July 1988 by the Canadian Engineering Manpower Board. The Board is operated on our behalf by the Canadian Council of Professional Engineers. This study projects a close match between the demand for and the supply of engineers until only about 1991.

2. Beyond 1991, there is an ever-widening gap between the need for engineers and the supply.

3. By 1994, the deficiency is expected to be 13,000 engineers, equal to ten percent of the profession. These projections represent the best available information today. They take into account a not unrealistic five percent attrition rate and they assume a continuation of today's patterns of immigration/emigration and current output from our engineering schools. Increased output from the universities will be achieved only by a further lowering of standards or by recruiting more vigorously from the 51 percent of the population we are now ignoring.

4. There is already underutilization of schools of engineering in Ontario. This underutilization is due to the lack of qualified entrants reflecting, in part, lower participation rates than in the past and as well, a lower available "college-age" population.

5. These schools have four choices - to recruit locally to get more men in their ranks, to recruit locally for more women, to recruit in other parts of Canada or to close down. They are now exercising the first three options and some are dangerously close to having to implement the fourth. With respect to the "closing-down" option, it is ironic that such a scenario might develop when we are on the verge of one of the greatest human resource shortages in engineering since the post-war years. On the choice of recruiting elsewhere, we, here in Manitoba, are already feeling the sting. Ontario schools of engineering are already enticing away from us 40 of our strongest applicants, using generous scholarships as the carrot. These students represent ten percent of our annual intake of 400 recruits at the University of Manitoba. And, of course, they represent the brightest and the best. Many engineering schools in Canada, including our own at the University of Manitoba, are on the verge of launching major initiatives to attract women into their ranks. There will be strong competition.

We, in the universities, will be looking for the support of the profession for our initiatives in attracting more women into the profession. □

# American Concrete Institute - Manitoba Chapter

A Manitoba Chapter of the American Concrete Institute has been formed. The first general meeting of the Chapter was held on Thursday, February 22nd, 1990. For further information contact any of the following: Don McIntosh, P.Eng.-President, 669-5666; Rob Waddell, P.Eng.-Vice-President, 477-1220; Dan Holfeld, C.E.T. - Secretary, 488-2997; Colin Gibbs, P.Eng.-(Technical Program), 943-7501; Joe Solomon, C.E.T.-(Membership), 661-6738; Sami Rizkalla, P.Eng., 474-8506. □

# The Conversion of a Male Chauvinist

*by: Frank Penner, P.Eng.*

We have come a long way. When I graduated from high school in 1952, the superintendent of a local school division asked his board to abandon a policy of automatically dismissing female teachers when they married. He was not concerned with womens rights; he was short of teachers. During the first ten years of my practice, I could walk into any engineering office and identify all the womens' work stations by the typewriter on the desk.

In the early 1970's, during a manpower shortage, I was forced to turn to "womanpower". We hired a women to do drafting, a woman for a survey crew and finally even a woman engineer.

I made an amazing discovery in those years when "women's liberation" was a hot topic - women were liberated; I was not. Women at work made me uneasy. I didn't know how to relate to them. Looking around at my male colleagues, I noted the same situation. It now seems almost unbelievable that our office issued a directive permitting women to wear pantsuits to the office provided the jacket extended some decent distance down the thigh. By working closely with these women I began to see them as persons and only incidentally as female. They influenced me and enriched my life. Thanks to Maryanne, Sandy and Myrna, also to Nelly, P.Eng., and Gloria, P. Eng. I feel good that Laura, P. Eng. will go further in her profession than her proud father.

Since history will, for some time yet, place many men in a position superior to women (at least on the organization chart) let me offer some simple advice to men of my generation: meet women on neutral turf, talk to them at their work stations or in a boardroom. Sitting behind your big desk in your private office may not intimidate them but it imprisons you. Ask their advice and follow it; or explain why you don't. Ask them to be present when you discuss matters which affect them.

Having said all this, let me add that women are not the same as men. Women have babies. They are usually the primary care-givers to children. Hence, they deserve consideration in matters of maternity leave, flexible work hours to attend to children's needs, etc. Single-parent (usually the mother) families have special needs. Governments and crown corporations are making reasonable progress in meeting these needs. What about private industry? Should, or can, an engineering firm, in a highly competitive situation, provide similar consideration? Should the tax system assist in this area? □

*(more on page 6)*

# Getting to Know Your Councillors

***The Publication Committee provides these interview articles to familiarize the membership with the people who represent you at the Council meetings.***

## R.P. (Ray) Hoemsen, P.Eng.

*by: D.S. Jayas, P.Eng.*

R.P. (Ray) Hoemsen was elected in October 1989 for a two year term. He was born and raised in Elkhorn, Manitoba. After graduating from Virden Collegiate Institute, Virden, Manitoba, he completed his B.Sc. in 1977 and M.Sc. degrees, both in Agricultural Engineering from the University of Manitoba.

His career began at Versatile Farm Equipment Company, Winnipeg in 1977 (now Versatile Farm Equipment Operations Ford New Holland Canada Ltd.) In 1982, he moved to the Industrial Technology Centre, Manitoba Research Council, Winnipeg. Mr. Hoemsen has worked in applied research, development, design and analysis of agricultural and mechanical products using computer aided engineering techniques when appropriate. In 1986, he was assigned the duties of the Research and Development Coordinator of the Institute for Technological Development, University of Manitoba with the major responsibility of providing liaison between the Faculty of Engineering and industry and government. Since 1982, Ray has specialized in Technology Transfer. In 1989, he was appointed an Adjunct Professor in the Department of Agricultural Engineering. Recently, he joined Monac Acoustic Monitoring International Corporation as Associate Vice-President.

Mr. Hoemsen has been active in the community and professional organizations. He has been President of the Wildwood Community Club for two years and is Vice-Chairman of the Assiniboine/Fort Garry Community Centre Board, where he chairs a committee which is developing a methodology to fairly allocate operating funds for all the community centres in District 6. He served as the Regional Director, Manitoba of the Canadian Society of Agricultural Engineering and is currently serving a term as Vice-President. In 1984, Ray was honoured with Agricultural Engineer of the Year Award by the North Central Regional of the American Society of Agricultural Engineers. He has also been active on various APEM committees.

Ray would like to promote cooperative activities between private and public sectors, including the University; to develop a better awareness of the technological resources in the province. This should enhance the global competitiveness of our province which features a diverse economy and many small industries.

He believes in promoting the positive image of our profession in the community. The public is only made aware of engineering when some disaster happens but not for its achievements. He would like to develop programs which will increase awareness of the engineering profession among school-age children. The creation of an interactive exhibit related to engineering with the assistance of the Manitoba Children's Museum; making presentations to the school board about the profession; and organizing an "in-service" type event about the profession for teachers and career councillors are some of the ideas he would like to pursue. □

## W.C. (Walter) Harrison

*by T.V. Murray, P. Eng.*

W.C. (Walter) Harrison was elected to APEM council last fall and brings to council a broad base of experience and an appreciation for the applied research side of engineering.

Born and raised in Medicine Hat, Alberta, Walter studied engineering at the University of Alberta in Edmonton. Although originally interested in Chemical Engineering, he graduated in 1963 with Distinction in Engineering Physics. Following graduation Walter pursued a M.Sc. in Nuclear Engineering (Heat Transfer) at Manchester University, England on an Athlone Fellowship. He returned to Canada on completion of his degree to join the Atomic Power Department of Canadian General Electric (CGE) in Peterborough, Ontario.

Walter remained with CGE from 1965 to 1970. He proceeded through a training program in Thermal Systems Design before moving into Safety Analysis, an area in which he would spend much of his career. During this period. Walter was responsible for the final safety analysis for the KANUPP reactor near Karachi in Pakistan.

In 1970 when CGE decided to move out of complete reactor systems and concentrate on reactor components, Walter saw opportunities with Atomic Energy of CAnada Ltd. He joined AECL in Mississauga, Ontario and originally worked as a safety analyst on the Bruce Nuclear Generating Station in Ontario. In 1972 a transfer moved him

*Continued on page 10*

# My Life As An Engineer

*by: N. Vitkin, P.Eng.*

When my family was leaving the Soviet Union in 1975, I was also leaving behind an engineering career with the Moscow Hydro. From the headquarters in Moscow, I worked mostly on projects in Siberia. My career path was interrupted and somewhat hampered twice when our two children were born. However, I knew that most senior positions achievable for a female engineer in our company would be equivalent to a Section Head position because women are very seldom promoted to more senior managerial positions in the Soviet Union.

When we came to Canada, my first move was to visit Manitoba Hydro to inquire about job opportunities, I was told that there were none. Answering ads and visiting private firms, I soon found that the private sector was reluctant to hire a female engineer from another country, with no references and limited spoken English. I could understand this reluctance, especially regarding the last point. So I am truly grateful to the Manitoba Water Resources Branch for the chance they gave me by hiring me. Although, in the final analysis, they got a better deal by starting an experienced engineer at the technician's level of pay.

In my almost 15 years of experience I have found no discrimination from my colleagues, acceptance of my authority by subordinates (after a trial period normal for any new employee), and respect for my professional judgement from my superiors. I have occasionally experienced some amazement, reluctance and amusement on the part of other agencies and the public dealing with a woman engineer. This, however, is quickly disappearing as more and more women are accepted as professionals. In total, I would say that my life as a female engineer in Canada has been a happy one.

PROFESSIONAL DEVELOPMENT COMMITTEE BREAKFAST MEETING

# The Professional Engineer & The Environmental Crisis

*by: W.B. Mackenzie, P.Eng.*

On November 21st, a number of us availed ourselves of the opportunity to hear one of Canada's most distinguished engineers speaking on a topic of widespread national and international concern; a topic on which our speaker has a vast background and a tremendous store of expertise - Carson Templeton speaking on "Engineering and the Environment". As many of us are aware, Carson Templeton is a recent recipient of the CCPE Engineering Gold Medal and a major consideration for this award related to Carson's background in environmental issues across Canada.

Carson zeroed in on the question of "Sustainable Development" and pointed out Canada's sorry record on environmental degradation. He noted that Canada produces more sulphur and nitrogen oxides per gross domestic product than any other developed country; 20% more than the U.S.A. and ten times as much as Japan. Canadians produce five million tons of hazardous waste each year, 80% of which enters the environment untreated. The chemical wastes in some of our water systems cause genetic defects in fish and there's a very real risk that these and other chemicals will have similar effects on human beings.

The main conflict in sustainable development lies between our present day interests and those of our progeny. But it is not a fair struggle because most of our progeny are not even conceived yet. Carson pointed out that people are basically selfish and are more concerned with their immediate interests than they are with those of future generations.

He stated that some of the problems relating to this matter include:

(1) the element of decision-making is in a sad state of obsolescence;

(2) society today has inadequate regulation; and

(3) the elements of society that hold us back from achieving sustainable development are the administrative conflicts between different governmental jurisdictions.

Nevertheless, Carson Templeton feels that we can achieve sustainable development in Canada. But we should not look to the politicians for leadership in this matter. He stated that if we are to achieve sustainable development it will happen when the Canadian people send messages to our institutions, our politicians, our public service, our academics and our professionals that the exploitation of resources, the direction of investments, the direction of technological development and institutional change must be consistent with both present and future needs. The engineering profession should do what it can and what it can do is considerable! Since engineers are often in management positions they can improve management skills. Since engineers are often in regulatory positions they can, perhaps not by edict but by constant pressure, make their employers' actions more goal-oriented. Engineers in government organizations can say to all of their contemporaries, "Don't tell me your problems - our prime mandate is to manage this resource for the benefit of this and future generations." He stated that we engineers must mobilize the will to achieve sustainable development and this will mean losing some of our extravagances. This would not be very serious if everybody were to lose them.

The third major question addressed by Carson was "What should the Engineering Associations do to achieve sustainable development?" He stated that we must extend every effort to ensure that our members' works and ways are adequate and economic but they should also serve humanity's present needs without compromising the ability of future generations to do likewise. Our profession needs a better understanding of the overall role which professional engineering plays in society and it must address a broader range of concepts and priorities than those which we might find in isolation in our own shop. We should develop an understanding of analyses that weigh benefits and costs in not only dollar units but in environmental and social units which consider long-term effects and remedial actions. We should take a public stance on decisions that have been made, or are about to be made which don't include alternatives and the long-term effects of environmental and social costs. We should use our influence to make the writing and operation of regulations goal-oriented instead of merely navel-gazing. We should develop within the membership a sense of global responsibility by engineers working abroad.

Carson Templeton pointed out that the clear-cutting of the rain forests, the depletion of the ozone layer, the dumping of chemicals into our waters and the hy-grading of our natural resources can foreseeably cause the collapse of the interrelated system we call Mother Earth. The skills to delay this indefinitely are available. The question is whether they will be used in time. He pointed out that engineers are in a unique position to materially help, and as professionals in the application of technology, have an overriding duty to do so. □

## Memorial Fund Established

CCPE has agreed to act as trustee of a private sector memorial fund honouring the students who died in the Ecole Polytechnique tragedy. The purpose of the fund will be to provide scholarships to encourage women to choose engineering as a career. The Canadian Congress of Engineering Students (CCES), is also participating in the initiative. It will be represented on the committee administering the fund and is actively soliciting contributions. Donations can be made locally through the Department of Private Funding, 179 Continuing Education Complex, University of Manitoba, Winnipeg, Manitoba R3T 2N2. A receipt for income tax purposes will be provided. For more information contact Chris Ross at 269-4698. □

# The 1990 Bonspiel

*by: Cyndi Kohuska, P.Eng.*

Another year is upon us, and with it came the Annual Curling Bonspiel. This year it was held on January 16th at the Granite and was attended by 21 rinks. From 7:45 a.m. until 5:00 p.m. battles raged on the ice. Competition was fierce and the games close. There were many changes at this years bonspiel; instead of waking up to the frigid January mornings, curlers were welcomed with balmy temperatures of -7 C (who needs Mexico anyway?).

*Vice President Bill McDonald presents the President's Cup to the Boyd Rink.*

The top three seeded rinks Suzuki (1st seed), Kavanaugh (2nd seed), and Mackenzie (3rd seed), were knocked out of the A side early on in the draw. An element "class", second only to the piper, was added by the Nazar rink representing Mallabar's. The most startling change had to be that the Garfinkel rink (minus Garfinkel) won 2 games, their first win in four years!

Bill McDonald, Vice President of the APEM presented the Presidents Cup Trophy (our President Ken Buhr was checking out the curling rinks in Florida) to Ken Boyd, Larry Mann, Karl Dern and Stan Hilderman. Runners up on the A side were the Sharpe rink of Dave Sharpe, Stan Bailie, George Pratt and Brian Sharpe. the Cook rink of Glenn Cook, Murray Walker, Roy Clement and Mike Saxton took the B side event with the Soulodre foursome of Gabe Soulodre, Paul Chale, John Lebthe and Peter McCallum runners up. The C event was won by Gil Mourant, Randy Fingas, Gord Smith and Greg Fiorentino. The Kavanaugh (2nd seeded) family were runners up in the C event.

*The Nazar Rink.*

The D event winners turned out to be the first seeded team of Jim Suzuki, Harvey Kaita, Murray Vanderpont and Brock Sanderson. The consolation event went to Roy Houston, Bill Borlise, Andy Chimko and Norm Ullyat.

Special thanks to Heather and Donna at the APEM office, the KGS Group for donating two sets of Jets tickets, Supercrete Inc. for the donation of four cordless screwdivers, Bill Saunders, our draw-master and all the curlers. □

# Council Reports

## DECEMBER 11, 1989 *by W.G. McKay, P. Eng.*

### AT WHICH COUNCIL APPROVES IN PRINCIPLE THE DEVELOPMENT PLAN FOR THE ADMINISTRATION OF THE ASSOCIATION AND ESTABLISHES THE POSITION OF DIRECTOR OF ADMISSIONS.

The meeting was called to order by Chairman, Ken Buhr, commencing at 1:30 p.m. This was a departure from the previous practice of meeting at 3:30 p.m.

Council quickly moved through the more routine items: minutes of the previous meeting, financial statements, licenses, engineering graduates, transfers, registrations, and reinstatements.

**Executive Committee Meeting Report**

The major item related to recommendations from the Consulting Engineers Committee on the Manitoba Building Code and Continuing Education, specifically Part 3, the Use and Occupancy section. The report had been developed following liaison with the Supervisor of Building Inspections for the City of Winnipeg and the Manitoba Association of Architects arising out of concerns over the quality of work being submitted under that section and the lack of formal training in the area through university programs. It also discussed the endorsement of a "Certified Professional Program" to counteract the concerns. Council concurred with recommendations of the Executive Committee to promote continuing education offerings on this and monitor the effectiveness of these offerings before endorsing a Certified Professional Program. It was agreed to participate in a joint statement with the MAA encouraging professionals to assure their competence in this area of practice. The Professional Development Committee was asked to facilitate and to monitor the uneffectiveness of the continuing education opportunities on behalf of Council.

**Development Plan for the Administration of the Association**

As an introduction to Council's consideration of this important program of administrative review, Chairman Buhr noted that there are eighteen standing committees and five Ad Hoc committees reporting to Council. This leads to a tremendous administrative work load arising from these committee meetings and the various initiatives. In addition there are the continuous operations of registration, licensing and accounting, etc.

In light of his pending appointment to the Executive Director's position, Mr. Ennis, in consultation with the Executive Committee, had prepared a detailed outline of mission, objectives and an administration plan showing staff positions, the expansion of office space and a new position of Director of Admissions. All of this overall programming is directed to the consolidation of both committee operations and office administration. Council approved this plan in principle to allow the administration changes to be undertaken in due course.

Council approved separately the establishing of the position of Director of Admissions together with the job description which calls for the applicant to be a Professional Engineer. The Executive Committee will solicit applications but the final approval will be by the Council.

Also arising from this management plan, was the arrangement for Mr. Mackenzie to remain on staff in the capacity of Special Projects Officer. The Executive Committee is to negotiate the terms of reference and compensation applicable to this position.

**Registrar**

When Council appointed Mr. Ennis as Executive Director, the position of Registrar was not included. Council at this meeting, therefore, also appointed him to the position of Registrar.

**Sports Committee and Ski Trip**

A delegation from the Sports Committee requested Council approval of an APEM sponsored ski trip in February to Minnesota. Permission was required as the committee's terms of reference only covers golf and bonspiel events.

Matters of personal liability and accident insurance as they might relate to the Association were raised and a disclaimer for such responsibilities arising from transportation and/or the skiing event was to be on any advertising material related to the event. With this advice the project was approved.

**Sustainable Development**

Mr. Hoemsen, liaison councillor of the Research and Development Committee, spoke to the issue of Sustainable Development which was the theme of Premier Filmon's address at the noon luncheon of the Annual General Meeting. The Provincial Government has a round table or committee on Sustainable Development which on first review indicated that the only Professional Engineer on this committee was Premier Filmon. Further review indicated one other engineer. The Research and Development Committee has drafted a letter to the Premier responding to his address and advising that the Research and Development Committee were prepared to respond to his challenge that engineers be involved in sustainable development. Further discussion of this draft letter revealed concerns that it might give the impression that the Association would be speaking out on Sustainable Development policy on behalf of all engineers. The matter was then tabled for further discussion pending more information from the committee.

With the deferment of some other items and with a decreasing quorum, Council approved the membership of thirteen committees of Council, these committees being empowered to add to their membership without further Council approval.

At 5:30 p.m., the president adjourned the meeting which had begun with the revamping of the administrative direction of the Association; a major objective of his term of office. □

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## JANUARY 15, 1990 *by R.D. Kitson, P.Eng.*

### AT WHICH COUNCIL CONSIDERED THE "WORK EXPERIENCE" REQUIREMENTS FOR REGISTRATION AND APPROVED EXPANSION OF OFFICE SPACE.

Much of the first council meeting of the new decade was devoted to routine business. Financial statements were reviewed and approved, registrations, licenses and transfers were approved. New members were added to a number of committees and the membership of other committees was confirmed. Signing authority for bank accounts was also transferred to the new executive.

All engineering graduates, licenses, and transfers before council were approved with one exception. This one application for a licence was held over until it could be confirmed that the applicant was currently registered as a professional engineer in another province or state.

A request was put before council by the Board of Examiners that confirmatory examinations be waived for persons having Ph.D.'s or equivalent degrees and considerable publications in the refereed engineering literature. This request was approved. This is reasonable as the situation only affects one or two persons a year; normally individuals hired as professors at the Faculty of Engineering, people who in some cases have written textbooks on the subject matter upon which they are being tested or have set and marked the similar exam in other jurisdictions.

Council also considered a plan to increase the office space. The adjoining space has been vacated providing an opportunity to expand the somewhat cramped meeting room and to create an office for the new Director of Admissions. Council gave the go ahead for the administration to enter into discussions with the landlord.

Council reviewed a proposal put forward by the Admission Review Board that the work experience requirements for all registration applicants be engineering work. In the past applicants with "unconventional degrees" might have had their experience in their academic field counted for registration. This situation primarily affects geologists. It came as a surprise to me that the APEM has in the past, registered people with Honours Degrees in Geology from the University of Manitoba and work experience as a geologist. The mandate of the Association is to govern the practice of the engineering profession not the practice of geology. Council approved the policy that all applicants must have engineering work experience. Now all engineers must have engineering qualifications for membership in the profession.P

Council also considered a policy on Association mailings. This discussion was created by an objection from a member to the inclusion of a notice in a mailing last fall on the letterhead of a consulting engineering firm advertising a

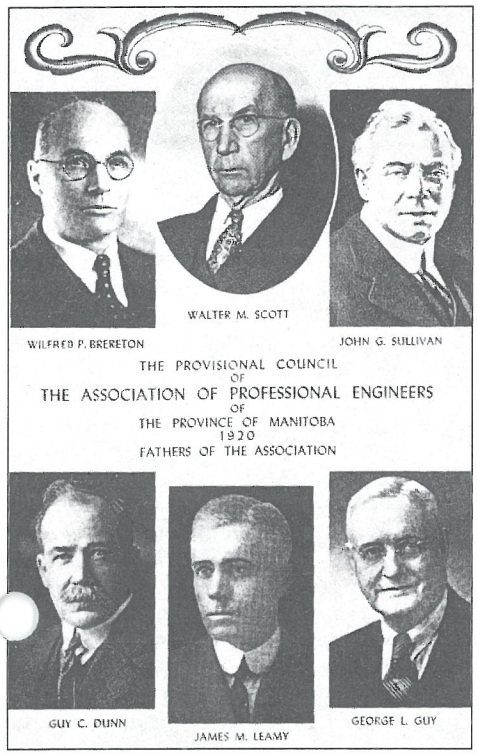
*Continued on page 11*

PUBLIC RELATIONS

# Happy 70th Birthday To A.P.E.M.

*by: S.M. Parent-Pulak, P. Eng.*

In the words of G.E. Cole, A.P.E.M. president over forty years ago, professional engineers are "...members of a truly great profession to belong to which...is...both a privilege and a responsibility".




As the 70th anniversaries of the passage of the Engineering Profession Act (March 20, 1920) and the first Council Meeting (held April 9, 1920) approach, we should not let professional engineers go unnoticed.

Over the years, the Association and its' members have met the engineering challenges presented by events such as the Great Depression, World War II, and mass immigration into Western Canada. In more recent times, the development of the province's natural resources and the North has contributed greatly to the prosperity and standard of living of Manitobans.

The Association has helped to ensure that these challenges were met successfully by qualified professional engineers aware of their responsibilities to society. We should be proud of the quality of service to the public, industry, and government which has been maintained over the past 70 years.

However, keeping the words of G.E. Cole in mind, we must look to the challenges that the next 70 years will present to us and our Association. The responsibility to stay up to date in our respective fields will place greater demands on our time as we try to keep pace with advancing technology. Also, the phenomenal increase in public awareness of environmental issues will have a significant effect on future engineering decisions. More than ever, professional engineers will have to walk a fine line between their obligations to meet the needs of a demanding society and to protect life, property, and the environment.

The Public Relations Committee plans to have the week of April 9th, 1990 declared "Professional Engineering Week" in Manitoba. During that week, we should all take the opportunity to reflect upon the past achievements of our Association and its' members and upon the legacy of "privilege and responsibility" we carry as we approach the twenty-first century. □

# U of M Engineers to Experiment with Weightlessness

A team of engineers, technologists and students from the Metallurgical Sciences Laboratory, Department of Mechanical Engineering at the University of Manitoba will be solidifying metal alloys in microgravity (near zero gravity) aboard a NASA aircraft. The team, headed by Dr. K. Tandon, P. Eng., a senior scientist with Manitoba Research Council presently assigned to the Department of Mechanical Engineering, includes professors M.C. Chaturvedi, P. Eng. and J.R. Cahoon, P. Eng., technologist J. Van Dorp and graduate student Fariba Saadat. The experiment is sponsored by the Canadian Space Agency (National Research Council - Space Division) and is an extension of a more comprehensive project involving the same team whereby solidification in microgravity will be accomplished during the flight of a sounding rocket. These experiments represent the first participation of members of the Department in space-program projects.

The team will be studying the effects of microgravity on the grain refinement of aluminum-copper alloys. "On the ground, under unit gravity", says Dr. Tandon, "molten metal is constantly moving due to buoyancy-driven convective flow". In a microgravity environment, this flow is absent and therefore the grain structure of alloys solidified in microgravity should be different from that in alloys solidified on the ground. A difference in microstructure should affect the properties of the alloy. The furnace, equipment and instrumentation for the experiment have been designed and constructed within the Department in accordance with rigorous NASA specifications. Peter Pachikara, an undergraduate student in the Department, assisted the team with the construction of the apparatus.

The aircraft KC-135, which is a modified version of the Boeing 707, offers a less costly alternative to the space shuttle for the conducting of microgravity experiments. The KC-135 achieves microgravity by flying a parabolic path which reaches a maximum altitude of about 28,000 feet. A typical flight comprises about 40 low-gravity parabolas with each parabola lasting about 75 seconds. During each parabola, microgravity of 0.01g or less is experienced for 15-20 seconds and is followed by a 1.8g pull-out. Dr. Tandon, Dr. Cahoon and Mr. Van Dorp have completed special high-altitude, aeromedical training at Canadian Forces Base Greisbach in Edmonton and are scheduled to fly aboard the KC-135 along with Canadian astronauts Marc Garneau and Bob Thirsk who will be acting as advisors during the flight.

Colleagues in the Department, as well as the members of the research team, are excited about the experiment which explores a new era of space research for materials processing in Manitoba. □

YOUR
PUBLIC RELATIONS
COMMITTEE

# A Committee Profile

*by: S.H. Matile, P. Eng.*

The APEM's Public Relations Committee was resurrected in June, 1988, following an extended period of dormancy and inactivity.

Terms of Reference were reviewed and revised, and a number of recruits were tried and tested before the present committee of eleven, spear-headed by Dan Prowse, was established.

The purpose of the committee, quite simply, is to promote awareness of the engineering profession as well as the APEM and its activities. The committee comprises three sub-committees, each focussing on a different target group: either the general public, engineering students, or high school students.

As you may already know, one of our recent projects was the Great Engineering Logo Contest. Many innovative logos were received, and we selected a winner last fall. The winning logo will be featured in a number of forthcoming publicity projects, including a new podium sign and a banner. (Yes, the temporary podium sign currently being used at APEM breakfast and luncheon functions was ours, too!)

As you may not know, our committee also initiated the establishment of three $500.00 scholarships for entry-level engineering students at the University of Manitoba. We have solicited a number of private firms and individuals to follow suit, to help prevent the annual "brain drain" (the yearly exodus of some forty top Manitoba high school graduates who are furthering their education elsewhere). We have also initiated and will oversee the presentation of four prizes annually at the Manitoba Schools' Science Symposium: one $500.00 entrance scholarship to the faculty of Engineering at the University of Manitoba for a graduating student, and three scholarships for younger students to the U of M's Mini-U, where the three 10-15 year olds will be exposed to, among other things, the faculty of Engineering.

We have also arranged for ten Manitoba high schools to receive copies of Project Magazine (the magazine for Canadian engineering students!) to hopefully expose more students to the profession.

Projects presently under consideration by our Committee include the preparation of a brochure for distribution to high school students; involvement in the University of Manitoba's Career Mentor Program (see this issue); and the development of an interactive exhibit relating to engineering at the Children's Museum. We are also discussing ways to recognize the APEM's 70th Anniversary. □

# B.C. Shopping Centre - A Program for Action

**The following is an excerpt from a report recently published by the Province of British Columbia.**

## *Report of the Implementation Task Force Station Square Commission of Inquiry**

### Executive Summary

Mr. D.J. Closkey was appointed under the Inquiry Act to report on circumstances surrounding the collapse of a portion of the Station Square Development ("Save-On Foods") in Burnaby, B.C. and to make recommendations. The Report of the Commission of Inquiry, Station Square Development, more commonly known as the Closkey Report, was completed in August 1988.

In accordance with Recommendation #18 of the Report, the Minister of Municipal Affairs, Recreation and Culture appointed an Implementation Task Force to oversee the implementation of nineteen recommendations, if acceptable by government.

This report marks the completion of the Task Force's primary objective, that of receiving submissions and preparing a recommended program of action for consideration by the Minister of Municipal Affairs, Recreation and Culture.

Following endorsement of this Report, the Task Force would go on to provide "encouragement" in implementing these recommendations and would maintain a monitoring role.

The Task Force agrees with the reasons behind Mr. Closkey's recommendations. Where they are at variance with an original recommendation it is partly because of the benefit of being able to receive comments subsequent to the Closkey Report. The Task Force discussed with Mr. Closkey the basic results of their investigation and believe that he is supportive of their conclusions.

**Of the nineteen recommendations put forward by Mr. Closkey, six were considered to be non-controversial and have already been implemented. These are:**

**Recommendation #4**
The Minister of Municipal Affairs, Recreation and Culture has requested municipalities and regional districts to refer, in their bylaws, to "the current edition of the building code" to ensure accurate referencing.

**Recommendations #13 to #17**
equesting that Steel Industry manuals and publications make certain modifications to their publications. The Task Force received permission to proceed on this.

**Of the remaining thirteen recommendations some will necessitate amendments to the engineers act while others can be realized through processes such as amendments to the provincial building code, dialogue with industry, information bulletins and the like. In summary, the task force offers the following positions:**

**Recommendation #1**
The Task Force supports some, not all, of the specific monitoring procedures recommended to be made at the municipal level for structural design submissions. The Task Force believes that the current procedures for submission of designs can be greatly improved and that much of the improvement can be achieved by adopting proposals put forward by the Association of Professional Engineers of B.C. (APEBC).

**Recommendation #2**
The Task Force supports the recommendation that standard Letters of Assurance be incorporated in the B.C. Building Code.

**Recommendation #3**
The Task Force supports the recommendation the Design Professional have clear and prime responsibility for his work.

**Recommendation #5**
In addition to individuals being registered, **the Task Force supports the recommendation that companies, parnerships, firms, and other associations providing professional engineering services also be registered under the Engineers Act.**

**Recommendation #6**
The Task Force supports the recommendation that such **companies, partnerships, firms and other associations should face deregistration for unethical, unprofessional or incompetent practice.**

**Recommendation #7**
The Task Force supports the principle of this recommendation. Before a structural engineer offers his services (later expanded to all engineering disciplines), he must show comprehension, competence and depth of experience beyond basic professional qualifications. This recommendation can be fulfilled –through requiring engineers to have "Permission to Consult".

**Recommendation #8**
The Task Force supports the principle of this recommendation, that of insurance, and recommends a requirement that engineers carry errors and omissions insurance.

**Recommendation #9**
The Task Force does not support this recommendation for the imposition of minimum fees for engineers. Other recommendations bring a greater degree of care to bear on professional standards. The Task Force recommends that no further action be taken on this Recommendation.

**Recommendation #10**
The Task Force supports the recommendation that provincial standards of practice be included in the provincial building code.

**Recommendation #11**
The Task Force supports the recommendation for the development of a Manual of Practice for construction except that it prefers it be developed at the national rather than the provincial level. Discussions with industry are in progress. Some Government funding may be requested at some future date.

**Recommendation #12**
The Task Force supports this recommendation which identifies issues the Manual of Practice (Recommendation #11) should address.

**Recommendation #18**
Fulfilled with the appointment of the Task Force.

**Recommendation #19**
This is an extension of Recommendation #11 and is supported.

**a copy of The Report of The Commission of Inquiry, Station Square Development (with the recommendations) is available for examination in the APEM office. Readers may also wish to refer to an article by V.L. Dutton, P.Eng. in the December 1988 issue of the Manitoba Professional Engineer.*

## Harrison

*(continued from page 6)*

and his family to Pinawa and closer to his western roots. He was placed in charge of a section doing research in power reactor safety and control. In 1976, he was appointed Branch Head for System Analysis and in 1982, he became Acting Head of the Materials and Mechanics Branch at WNRE.

In 1983, Walter was attached to the National Uranium Tailings Program (NUTP) and he spent the next two years at the Canada Centre for Mineral and Energy Technology in Ottawa. He served as the acting director of the NUTP for part of this time.

Walter returned to WNRE in 1985 to become the manager of the Thermalhydraulics Branch. In January 1986, he was appointed to his current position as Manager of the Technical Service Division at the Whiteshell. In this capacity he has senior management responsibilities for analytical chemistry, design and project engineering, and for the operation of nuclear reactors, accelerators, shielded facilities and site waste management facilities.

Today, his major projects, apart form the administrative duties of managing his division, include establishing a Quality Assurance Program within his division and work with the Nuclear Safety Advisory Committee (NSAC) which provides senior level safety review for AECL projects.

Walter is looking forward to a productive term as an APEM councillor. One issue of particular interest to him is that of the image of the engineering profession. To attract quality people into engineering in the future, engineering must present a "quality image" now. Although Walter agrees that APEM will not solve this issue on its own, he feels that we and the CCPE should increase our efforts in promoting a positive public image of engineering and its contribution to society.

Walter and his wife Ruth have three daughters, Gwen who works in Winnipeg, Karen who is studying Physical Education at the University of Manitoba and Linda who is attending high school in Pinawa. Away from work, Walter enjoys the outdoors through sailing, sailboarding, hiking, and cross-country skiing.

As well as his membership with APEM, he is a member of the Canadian Nuclear Society, the Canadian Society for Chemical Engineering, the Canadian Nature Federation and the Manitoba Naturalists Society. □

# Manitoba NACE Section Formed

*F. Macario, P. Eng., Secretary Treasurer, Manitoba Section*

In January of 1988, a group of concerned individuals, in consultation with local businesses connected directly or indirectly with the corrosion field, decided to establish a local section of the National Association of Corrosion Engineers (NACE). The purpose of the new section would be to address the topic of corrosion as it applies to Manitoba. With the establishment of a founding board in the spring of that year, an application was made to the Canadian regional and NACE headquarters for a local chapter. That summer section status was granted and, with financial assistance from the Saskatchewan section, the Manitoba section was formed.

The focus of the new section was to increase public awareness of NACE and its activities in the corrosion field. Dinner meetings were held throughout the first year. Topics discussed at these meetings included cathodic protection, history of corrosion prevention in water distribution systems, protective coatings and concrete corrosion.

A highlight of the section's first year was the presentation of 70 reference publications, dealing with corrosion, to the University of Manitoba Engineering Library. Dr. M. Chaturvedi, Associate Dean of the Faculty of Engineering, graciously accepted the publications on behalf of the University. In his acceptance speech, Dr. Chaturvedi pointed out how this donation is an nple of the growing cooperation between institutions, industries and associations such as NACE, in areas of common interest. For persons interested in the publications donated by NACE, the list may be obtained from the Engineering Library or from any NACE member.

NACE is the world's largest technical and professional society dealing with the prevention and control of corrosion. Through committees, publications, standards, courses and certification, it provides important services to the ever-changing and ever-expanding field of corrosion prevention. For more information on NACE, or to become a member, please contact Mr. Ron Britner, Section Chairman at (204) 474-3575 or Dr. Wayne Tennesey, Membership Chairman at (204) 942-4424.


*George Rajotte, NACE Trustee, presents publications to Dr. M. Chaturvedi P.Eng. for the Engineering Library.*

# West-Man News

*by Dick Menon, P.Eng.*

The West-Man Chapter is planning our next supper meeting to be a joint venture with The Manitoba Chapter of the American Public Works Association. The supper meeting is scheduled for Thursday, March 1, 1990, with Dr. Frank Gunston as the guest speaker. Dr. Gunston graduated as an engineer before he took his medical training. He has combined his knowledge from the two disciplines to develop artificial knee joints in 1969. In 1989, he was recognized for his work in the field with one of five Manning Awards for Canadian Innovation.

Also planned with the supper is a two day seminar relating to Public Works and a fun bonspiel. We will be sending more details on the activities shortly. Look forward to meeting you all at the supper/bonspiel. □

# Thompson News

*by: Robert Cotterill, P.Eng.*

"Greetings" from the cold white north. While the rest of the province is wondering where the snow is, Thompson is literally up to their knees in it. December felt like January and cabin fever has set in early.

I had the pleasure of spending three days with some of my colleagues, at Inco, on a Lotus 123R3 training course and I learned a great deal. The trainer was no other than our own Dave Nicholls, who challenged us and kept our interest for three days.

For those of you who thought that I had lost my pen, I didn't. News was very scarce up until November. In November, approximately 25 of our members met at the Burntwood Hotel for dinner. After dinner we filled our glasses and watched the APEM video entitled "To Engineer is Human". As in the past, a good discussion followed.

Our next meeting is tentatively scheduled for early February. While the agenda is still being drawn up one item will have to be the election of new officers. Over the last year we have had a number of new engineers join our merry band. Hopefully, one or two will consider serving on the executive.

While this article is quite short, I will publicly commit to corresponding more often. In fact, what I would like to do is interview one or two of our members each issue. In that way, others will become more aware of the exciting issues our members are dealing with.

So long until the next issue. □

# rDNA

*(continued from Page 4)*

Because living organisms are involved, an important part of the design has been to ensure that they do not escape into the environment. Any bacteria in the light phase of the process liquid are chemically killed in the sump tank before further dilution and release to the City's sewage system.

Once the desired product has been extracted from the "broken" cells using solvents and the homogenizer, the unwanted cells are separated out in another pass through the centrifuge and are then heat-killed in the autoclave. Again, stringent controls are maintained on this operation. Final disposal of the sludge is at the Brady Road land-fill site.

The end product from the pilot-plant is fed to the "product tank" which is a mobile vessel kept in the process-utilities room. When filled, it is taken to another part of the building for a purification process. The final product is a freeze-dried crystalline powder which is sent on to another plant for compounding (formulation) into the pharmaceutical products you find in your local drug-store.

The operation is a batch process with cleaning and sterilizing being required between batches in an eleven-step process. The utilities room contains the boiler for the "clean" steam and hot water while a battery of filter-units and reverse-osmosis membrane-units produce the "clean" water. Small quantities of this clean water are further purified to produce the "pure" water that is needed for analytical purposes. There is also a unit for producing the "bone-dry, oil-free" compressed air used in the production process and in the cleaning process.

It should be noted that this facility is regulated by the Health Protection Branch and operates so as to meet the guidelines and requirements of the American Food and Drug Administration and the World Health Organization. The facility complies with current Good Manufacturing Practices (cGMP)

ABI Biotechnology intend to operate this pilot-plant in order to optimize the process, to obtain the parameters which will be used for the design of their production facility, and to train personnel. This new production facility should be added to Manitoba's industrial capacity within the next 18 months. Like the present pilot-plant, it will be another Canadian "first" for ABI and their young chemical engineer. □

# Council Reports

*(continued from page 8)*

course on engineering analysis. Normally, the Executive Committee decides on what can be included in the bi-monthly mailings, however, if scheduling constraints prohibit this the administration will make a decision based on an assessment of appropriateness and general interest, to the membership. That is what happened in this case. The members objection was that the inclusion of the notice gave the firm an unfair advantage. Council directed the Executive Committee to develop a firm policy to guide the administration on mailings taking into consideration all factors involved. □

# CCPE Scholarships

The Canadian Council of Professional Engineers (CCPE) has announced its scholarship program for 1990. This year, $32,500.00 will be offered through 5 scholarships which aim to encourage the achievement of excellence in the Canadian engineering profession through the promotion of advanced studies and research programs.

In 1973, the Canadian Council of Professional Engineers and NORTH AMERICAN LIFE ASSURANCE COMPANY joined forces and sponsored a scholarship for further study or research in an engineering-related field. In 1989, the Canadian Council of Professional Engineers, in conjunction with ENCON Insurance Managers Inc. and THE OPTIMUM Financial Services Limited, parent company of Monnex Insurance Brokers Limited and J. Meloche Inc., Insurance Brokers added two new scholarships to its program. In 1990:

- The NORTH AMERICAN LIFE ASSURANCE COMPANY Scholarship program will offer three scholarships of $7,500.00 each to provide financial assistance to engineers returning to university for further study or research in an engineering-related field. Since the inception of this program, more than $269,000.00 have been awarded to 69 winners.
- THE OPTIMUM Scholarship program will offer one scholarship in the amount of $5,000.00 to provide financial assistance to engineers returning to university for further study or research in a field other than engineering. However, the field of study chosen should favour the acquisition of knowledge pertinent to enhancing the performance of the candidate in the engineering profession.
- An ENCON Endowment in the amount of $5,000.00 will be awarded to a professional engineer wishing to pursue studies or research in the area of engineering failure investigation. Engineering failure analysis has recently emerged as a separate and recognized discipline with a growing number of engineers specializing in this field.

To be eligible for the scholarships, candidates must:

- be registered as full members of the provincial/territorial professional association/order in their province/territory of employment;
- have been accepted for post-graduate study by a recognized university.

The deadline for all applications is May 1st, 1990.

To receive further information and an application form, apply to:

Lorelei Scott
National Scholarship Program
Canadian Council of Professional Engineers
401-116 Albert Street
Ottawa, Ontario
K1P 5G3
Phone (613) 232-2474
Fax (613) 230-5759

# — Coming — Events

**Construction Management Techniques**
February 22-23, 1990
Pan Pacific Hotel
Vancouver, British Columbia
Contact: TUNS Halifax
Toll Free: 1-800-268-4704

**Professional Engineers Wives Association Luncheon**
February 27, 1990
Manitoba Research Foundation
409 Tache Street
Contact: Mrs. Elaine Johnson
Phone: (204) 488-7774

**Optech Conference**
A conference and exhibition for firms with special technologies.
March 27-29, 1990
Winnipeg, Manitoba
Contact: L.H. Tough, P.Eng.
Industry, Trade & Tourism
Phone: (204) 945-2030

**"Globe '90" Global Opportunities For Business And Environment**
March 19-23, 1990
Vancouver, British Columbia
Contact: Globe '90
250-1130 West Pender Street
Vancouver, B.C. V6E 4A4
Phone: (604) 681-6126
Fax: (604) 681-1049
Telex: 04-352848

**Canadian Coastal Conference 1990**
May 8-11, 1990
Donald Gordon Centre
Queen's University
Kingston, Ontario
Contact: Dr. J.W. Kamphuis
Department of Civil Engineering
Phone: (613) 545-2148
Fax: (613) 545-2128

**Fourth Conference On Toxic Substances**
April 4-5, 1990
Queen Elizabeth Hotel
Montreal, Quebec
Contact: Alain Bernier
Environment Canada
Phone: (514) 283-2349

**Technical Seminar 13th Arctic And Marine Oilspill Program**
June 6-8, 1990
The Chateau Lacombe
Edmonton, Alberta
Contact: Mr. M. Fingas
Environment Canada
Phone: (613) 998-9622
Fax: (613) 991-9485

CALL FOR PAPERS:
**Canadian Conference On Electrical And Computer Engineering**
September 4-6, 1990
Westin Hotel
Ottawa, Canada
Theme: Ten Years to 2000
Deadline: April 14, 1990
Contact: Dr. J. LeRoy Pearce
Defence Research Establishment
Phone: (613) 998-2207
Fax: (613) 998-4560

**Advanced Materials And Structures In Civil Applications**
February 28, 1990
Delta Winnipeg
Contact: Karen Merrithew
Canadian Advanced Industrial Materials Forum
Phone: (416) 363-7261
Fax: (416) 363-3779

**Thesis Day - Electrical And Computer Engineering**
March 23, 1990
Anyone interested in reading theses:
Contact: Alex Jakobschuk, P.Eng.
University of Manitoba
Phone: (204) 474-9603

## INSTITUTE OF TRANSPORTATION ENGINEERS

# JOHN VARDON MEMORIAL SCHOLARSHIP

This is a scholarship program for studies in Transportation Engineering. An award of $1,250.00 is available to assist in the payment of tuition, fees, books and supplies for the 1990-91 academic year.

Eligibility

1. Candidates shall submit evidence of acceptance, or probable acceptance, for study in a program in Transportation Engineering.
2. Candidates must be registered as full time students in a transportation program at a Canadian university.
3. Candidates must be Canadian citizens.

For application forms please write to:

D.M. Henderson, P.Eng.
Engineering Department
453 West 12th Avenue
Vancouver, British Columbia
V5Y 1V4
Phone: (604) 873-7393
Fax: (604) 873-7800

## CHANGE OF ADDRESS NOTIFICATION

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Address _____

City _____ Province _____

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Employer _____

Bus. Tel. _____ Date Effective _____

Please notify us of any change of address as soon as possible. Mail to: A.P.E.M., 330-530 St. Mary Ave. Winnipeg, Manitoba R3C 3Z5 OR by FAX (204) 942-3718