

Retracing Paths to Advance Future Journeys



Dr. Ruby Heap, Associate Vice-President Research University of Ottawa,
UOWERG

Dr. Crystal Sissons, Independent Historian, UOWERG

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1950s-1970s: We Need More Women in Engineering



- As early as the 1950s Canadian women engineers were working to change social attitudes about women entering engineering.
 - Manpower discourse/Women’s Bureau
- Initial beliefs centered on the idea that simply increasing the number of women in engineering would solve the problems the current women faced.

1970s: Optimism for the Future



- *Report of the Royal Commission on the Status of Women in Canada (1970)* - a blueprint for change
 - Canada's First Woman Engineer: Elsie Gregory MacGill
 - Equality in the workforce
- International Women's Year
 - Special Section of the *Engineering Journal*
 - "Women in Engineering: Female Engineers: a boon to the profession"
- Danielle Zaikoff
 - President: Order of Engineers of Quebec – 1975
 - President: Canadian Council of Professional Engineers 1978

Optimism for the Future:



- The picture is changing. And as more and more North American women become engineers, they will simply be reflecting the rapid progress of a wide-spread trend in the modern industrial western democracies.... Not only is the era of the exploitation of women by men at an end, but also, faced with declining productivity, inflation and tough international competition for export markets, North Americans can no longer afford to deprive themselves of the potential contribution of women. **Get used to women engineers. You're going to see many more.**

- Colleen Isherwood, "Women in Engineering: Female engineers: a boon to the profession", *Engineering Journal*, 58/5 (November/December 1975), 10.

The Roots of Social Science Based Research on Women in Engineering



- Dr. Dormer Ellis
 - Engineer (University of Toronto), and social scientist (Doctorate in Education), OISE
 - By 1975 she identified social attitudes as one of the key obstacles to women's access to engineering:

“The crucial and necessary changes are frequently required in areas where no legislation can ever be introduced – in attitudes.”

Dormer Ellis, *These Women are Engineers: Questionnaire Survey for the 2nd Convention of Women Engineers of Canada* (1983)

We Need To Mobilize for Change



- As their number slowly rose, women engineers saw the need to come together for support and to encourage other women in the profession.
- In 1977 Women in Science and Engineering (WISE) was established with founding president Claudette Lassonde
 - Sought role models (i.e. Elsie Gregory MacGill)
 - Acted as role models (i.e. student branches)

1980s: Women Engineers in the Spotlight



- New Organizations

- SCWIST established – 1981 (British Columbia based)
- WISEST established -- 1982 (University of Alberta)
- Pathmakers Programme – 1986 (Ottawa, Ontario)

- National Conferences

- First Canadian Convention of Women Engineers - 1980
- Second Canadian Convention of Women Engineers - 1983
- The Canadian Conference of Women in Engineering Science and Technology – 1987

1986: Claudette McKay-Lassonde – President-Elect for APEO



- “It is due time for us to see more women engineers in senior positions for a number of reasons. First of all, I strongly believe that we are ready for it and can handle it. Secondly, as our society is becoming increasingly technologically oriented, the future supply of engineers will not be able to meet the demand. One way to increase this supply is to attract more women to the profession. And, what is more attractive to a female teenager than to hear and read about successful women, and in this case women engineers, after whom they can model their future career?”
- Claudette MacKay Lassonde, “Women in Engineering” *National Newsletter Canadian Council of Professional Engineers*, in *Engineering Digest*, Volume 32, No. 4, (April 1986), 9.

The Search for a Science and Technology Policy



- Since the 1960s the Canadian Government was attempting to design a national science and technology policy
- 1984: Election of Conservative Government of Brian Mulroney
- Canada's First Science and Technology Policy formally released in 1987

Women Meeting the National Science and Technology Needs for Highly Skilled Workforce



- Creation of the NSERC/Nortel Chair for Women in Science and Engineering at the University of New Brunswick - 1989
 - Government, Industry, and University Partnership
 - First Chair: Dr. Monique Frize

Catalysts for Action



- Montreal Massacre – December 6th, 1989
 - Renewed interest in the status of women in engineering
 - Governments, universities, professional organizations and women's organizations responded:
 - The Canadian Engineering Memorial Foundation, established in 1990 by Claudette MaKay-Lassonde, President of APEO
 - NSERC Women Faculty Awards 1991

- Existing economic situation and predicted shortage of engineers by 2000

More Than Just Numbers Report

PARADIGM SHIFT



Paradigm Shift: *More Than Just Numbers Report* - 1992



- **CCWE** – established in February 1990
 - Chair: Dr. Monique Frize
- **Mandate:** “to uncover **the social and cultural barriers** responsible for the underrepresentation of women in engineering and to design bridges that will bring them as full participants into the professions”. (5)
- “The recommendations in *More than just numbers* go beyond attracting greater numbers of women into the engineering profession. Canadians must ensure that the learning and working environments welcome, support and appreciate women engineering students and engineers.” (5)

More Than Just Numbers: “Making It Happen”



- Framework
 - Laying the Foundation
 - Education For and By Women Engineers
 - Engineering Workplaces for Women
 - Support By Association
- Follow-up Conference to Assess Progress:
 - May 1995, University of New Brunswick

Ursula Franklin: “Looking Forward, Looking Back”(1995)



“The process of identifying the obstacles in the path of women in engineering yielded a number of significant results. It responded to the publicly expressed need of the engineering profession to see more clearly what was going on in their own house, and it allowed us to separate specific obstacles and suggest remedial measures. The report *More Than Just Numbers* not only provided recommendations based on statistics and well-documented evidence, but also insisted on benchmarks, tangible evidence of change and of accountability. The report clearly states that fixing a few things behind closed doors is not good enough.”

More Collective Action



- The Canadian Coalition of Women in Engineering, Science, Trades and Technology (CCWESTT) an umbrella group established in 1992

“Towards Building a New Scientific and Engineering Culture in Canada”



- December 1994 – NSERC established a Task Force on Women in Science and Engineering
- **Mandate:** To advise Council on how to create an environment that facilitates and encourages greater participation of women in science and engineering research in Canada, particularly through the core programs. (1)
- The report was submitted by Dr. Monique Frize in 1996

NSERC Creates 5 Regional Chairs for Women in Science and Engineering



- **Recommendations 19** (of NSERC Task Force): That NSERC launch a new competition (funded through its Industrial Chair budget) for additional Chairs (in Women in Engineering, Science and Applied Science), as described in the report.
- Dr. Monique Frize (Ontario)
- Dr. Maria Klawe (British Columbia/Yukon)
- Dr. Claire Deschênes (Quebec)
- Dr. Mary Williams (Atlantic Region),
- Dr. Elizabeth Cannon (Prairie Region)

Going Global



- International Conference of Women Engineers and Scientists (ICWES)
 - First Conference: New York – 1964
 - Dr. Dormer Ellis ensured Canadian representation
- International Network of Women Engineers and Scientists (INWES)
 - A response to an UNESCO resolution from 1999
 - Established in Ottawa, Ontario in 2001, launch 2002
 - Founding President - Dr. Monique Frize
 - Founding Executive Secretary – Dr. Claire Deschênes
- INWES Education and Research Institute (ERI) est. 2007

La Francophonie



- 1998: Chaire Marianne-Mareschal École Polytechnique
- 2003: l'Association de la francophonie à propos des femmes en science, technologies, ingénierie et mathématique (AFFESTIM)
 - Présidente – Claire Deschênes
 - Publications:
 - *Les grands enjeux des femmes pour un développement durable* (2010)
 - *Le leadership des femmes en STIM – sciences, technologies, ingénierie et mathématiques* (2008)

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CREATING BRIDGES BETWEEN ENGINEERING AND SOCIAL SCIENCES



Creating Bridges Between Engineering and Social Scientists



- Fostered by the NSERC Chairs
- Increased collaboration leading towards formalized connections and research collaboration at the provincial, national and international levels
- Supported by the profession (i.e. funding from the PEO)
- Supported by the Social Sciences and Humanities Research Council of Canada
 - Grant to the University of Ottawa Women in Engineering Research Group (2004-2008)
- INWES organizes Gender Symposiums on gender issues in 2002, (Ottawa), Seoul (2005) and Lille (2008)

UOWERG: Example of the Bridging of Academic Disciplines



- An interdisciplinary team
 - Dr. Ruby Heap (History)
 - Dr. Janice Ahola-Sidaway (Education)
 - Dr. Ann Denis (Sociology)
 - Dr. Monique Frize (Engineering)
 - Dr. Donatille Mujawamariya (Education)
 - Dr. Crystal Sissons (History)
- *Images and Experiences: Gender and Engineering Education in Canada*

CCWE + 20



- This conference is an important historical milestone!
- **What will the next 20 years bring?**
- ***The 2011 CCWE +20 Conference illustrates the heightened sense of the complex nature of the problems in engineering as well as the firm commitment to advocate new approaches and new solutions.***