

## Life Lessons from Female Fellow #2

*Elisabeth M. Drake, Massachusetts Institute of Technology*

First, my public resume (Table 1):

**Table 1.**  
**Elisabeth M. Drake**

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### Education -

SB (1958) and ScD (1966), Chemical Engineering, MIT

### Employment -

Arthur D. Little, Inc. (consulting firm):

1958-64, staff engineer in Cryogenic Engineering group,

1966-76, head of risk analysis group

1980-82, Vice President of Technological Risk Management

1986-88, Head of Corporate Health, Safety and Environment Practice

Northeastern University

1982-1986, Cabot Professor of Chemical Engineering and Chair, Chemical Engineering Dept.

1985-86 Acting Dean, School of Engineering

Massachusetts Institute of Technology

1973-74, Visiting Associate Professor of Chemical Engineering (on leave from Arthur D. Little)

1990-2000, Associate Director for New Technology, MIT Energy Laboratory

2000- present, Emeritus Staff, MIT Lab for Energy and the Environment

### Professional activities:

AIChE: Member since 1957. Fellow since 1982. Elected Council member 1988-90. Member Ichthyologists (Boston local section). Technical Adv. Bd, CCPS and participant in CCPS projects

ACS, SWE, NAE – member

NAE - Membership committee chair, 2000

NRC – Various study committees 1992 – present

MIT – Corporation member 1981-86

Various governmental advisory panels for NASA, Coast Guard, DOT, DOE, EPA

**Publications:** about 70 with co-authored text book published in July 2005

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### Life behind the resume!

**Childhood:** Only child; dad was tax lawyer and mom was high school math teacher. Dad taught me to use tools and taught me that I could learn to do almost anything I wanted to do, if I were willing to ask questions and ask for some help here and there. Older male cousins were headed for engineering school – I hung out with them (uninvited!) and learned to work on cars. Was very good in school, but also was a social misfit. Applied to MIT thinking I wouldn't get in; then went and figured I'd flunk out and go somewhere else to study

languages. But I got decent grades and found that interest and hard work would get me through the engineering curriculum.

**Marriage:** Found a nice introverted guy who also was a workaholic. Got married just before my SB graduation. Started working at ADL as an engineering gopher while husband was getting his doctorate. Had several miscarriages and a baby born with major birth defects, who only lived two weeks. Husband decided to seek an academic career. So I decided I would forgo a family and focus on a career. I got my doctorate after he finished.

**Lesson 1: If you want future career flexibility (between industry/consulting/ academia), seek a doctorate. [If you are interested in industry, a BS will suffice. If you want to go into sales or management, try an MBA. If you don't know, you can wait a while before going back to grad school.] In starting a career, think about your own lifestyle needs when considering jobs that require heavy travel, frequent relocation, intense competition, high risk, or skills that don't match your interests and strengths.**

**Early career:** When I returned to ADL with my doctorate, I was able to move from cryogenic engineering into an emerging area, consulting for utility companies starting Liquefied Natural Gas projects. Safety was a big issue, and I moved into areas of safety analysis and technological risk management. Worked 70+ hour weeks, did a lot of international travel, built a successful business area with several key colleagues.

**Lesson 2: Jump into a new job with enthusiasm and interact with as many people in the organization as fit your interests. Don't be shy about asking questions or seeking help. Develop a positive network and stay away from people that play games or compromise your professional standards.**

**Lesson 3: Find professional pathways that increase your options for the future.**

**Mid-career:** Continued consulting, but added a lot of professional activities – with AIChE and as advisor to various governmental agencies. Built connections that were very useful in expanding consulting opportunities as well as personal knowledge.

**Lesson 4: Get active in professional service activities to build a wider network in your areas of interest.**

**Nearing a mid-life crash:** Working harder than ever, away from home a lot, getting more stressed out. Increased drinking and prescription pill use. [I now know that I am one of the 10% of the population who are predisposed to alcoholism.] Had bouts of depression. Decided problem was intensity of consulting environment. Took job at Northeastern University – less stress, but my drinking was still out of control. Tried to get sober a few times – unsuccessfully. Husband filed for divorce. Got caught drinking on the job – went to a rehab, but was embarrassed to go back to NU -- so quit my tenured job and went back to ADL. Tried to not drink and worked hard as the head of their HSE practice with some success -- but got fired for repeated drunkenness in 1988! Later spent a couple of months as a street drunk.

**Lesson 5: If your life pressures become overwhelming and you don't take some healthy action to relieve them, you will get in trouble one way or the other, no matter how smart you are!**

**Starting again:** Spent six months in a halfway house and got a minimum wage job selling housewares (had trouble even getting that job at age 51!). Learned that I needed others to show me how to find some balance in my life and to become a "human being" instead of a "human doing!" Spent two years trying hard to get another professional job – or at least something that paid a living wage. Many turn-downs. Finally got hired by MIT on the suggestion of a professional colleague that knew my situation and knew of a suitable opening at MIT. My two lost years were covered up as "independent consulting."

**Lesson 6: If you have a career or personal disaster, shift gears and try something else. Don't give up; do seek and accept help from old and new friends.**

**Career at MIT:** Was scared that I couldn't do the job – that "they" would "find out." Learned from new non-academic friends that my job was just to show up and do the best I could. Got interested in how new energy technology might facilitate major changes that need to be made in our world of burgeoning population and consumption. With a couple of colleagues, started a graduate course on "Sustainable Energy." This is obviously a very timely topic. Love teaching and doing research in this area – even now that I am technically "retired." I still work hard – but not obsessively. And I have lots of other interests and activities that enrich my life.

**Lesson 7: Older engineers can move into a new career if they are persistent and willing to take some risks.**

Finally, *what I wish I knew* as a young engineer starting on my career:

**Lesson 8: A successful life involves a balance between professional life, family life, and time to maintain personal health and happiness. It also involves a balance between self-interests and an ability to share time and interests with your family and a wider community. [Don't forget to be open with your family partner about mutual needs and ways to find the additional support you may need as both your careers progress, especially if you want children or have parents who may become dependent as they age.]**

**Summary:** Though I had to learn some lessons the hard way, I have never regretted my choice of Chemical Engineering as a career and I hope that you will also have a rewarding career and avoid some of my mistakes! Many changes have happened in the world during my lifetime: global population went from 2 to 6+ billion, technology has changed substantially, and there have been wars and economic ups and downs. You will have new challenges during your lifetime as engineers as we deal with globalization, shifting economics, and conflicting values. China and India are emerging as major economic and technological players. Your generation will have to find better ways to deal with issues of climate change, poverty, environmental degradation, and societal instabilities. Chemical engineers have the potential to make major contributions now and in the future. I hope that Chemical Engineering will remain a profession with the highest ethical standards. If you each do your part, there are great opportunities for positive change awaiting you.