

Letter to a Graduate Student

from Ursula Franklin

Le texte ci-dessous est une lettre adressée à une diplômée qui souhaite entreprendre une carrière scientifique. Il présente un argument en faveur de la poursuite d'une carrière scientifique qui comprend une description de la vie et de l'oeuvre de Maggie Benston et propose aux femmes scientifiques des moyens de surmonter les préjugés et les obstacles qui se dressent sur leur chemin.

Dear Marcia,

A few months ago, you came to me to talk about your future. Should you, a feminist and a graduate student in science, embark on a doctoral program in a physics related field? Is not the gulf between the goals of a scientist and the goals of a feminist too great to be bridged within one person who wants to live in peace with herself?

We talked for a long time and I spoke a lot about my friend Maggie Benston and how her life and work illuminates your questions and helps to answer them. Yet, after you had left, I felt uneasy. Did my argument for not giving up on science make sense to you? Was I able to give you an idea of the nature of Maggie's pioneering contributions and of her, a vibrant woman and an original thinker and doer?

Now that this volume on 'The Legacy of Margaret Benston' has been assembled, I want to return to our conversation. In many of the papers here, you will find clarification and elaboration of the ideas we touched on. Maybe we should now pick up on three strands that ran through our talk. You asked about Maggie as a person—what made her tick? Why did she have such a strong influence on people's understanding of the technological world around us? What does her life's contribution mean for young women like yourself?

For me, the uniqueness of Maggie lies largely in the unity of her life. She wasn't a scholar and academic on Monday, Wednesday and Friday, a unionist on Tuesday and Thursday, a member of the Women's Movement on the weekend and an environmentalist when on vacation. She was all of these—and more—at the same time. Each of her activities was rooted in the same soil, each aspect of her life was linked to and informed by all other aspects of her being. The pattern-setting force in her life was her belief in the possibility and practicability of a feminist, egalitarian, and non-oppressive society. Whatever Maggie did, as well as what she did not do, must be understood as a direct consequence of this belief.

People have often commented on how few hang-ups Maggie seemed to have. As I recall, she did not spend much time agonizing about joining a particular demonstration or supporting a struggling solidarity group—her response was quickly derived from her general standpoint, the place where her life was anchored. Once her basic position, that *patriarchy or hierarchy is not an option*, had been taken, daily hang-ups faded into the background. Much strength flows from a fundamental decision not to accept the rules of an alien convention. There is the liberating effect of declared non-conformity, the joy of sharing and following one's own conviction, the lack of inner contradiction. A lot of creative energy becomes available, when the internal conflicts have been eliminated. Indeed, I feel that the great influence that Maggie asserted on so many people springs directly from the qualities of her own life—its inner consistency, its openness and rootedness in a feminist vision.

By the way, Marcia, don't overlook the trap here. In dress and life style, demeanour and politics, Maggie stressed her ordinariness—just like everybody else. Don't let this fool you. Maggie was in many ways quite extraordinary and exceptional, not the least for her ability to integrate the ordinary and the extraordinary into one seamless life.

Maybe we should talk about Maggie's contributions to feminist theory. We can speak about her feminist practice later, when we discuss what may lie ahead for you. Just remember that for Maggie, theory and practice were inextricably linked and she would joyfully deny the existence of a tactical boundary between them.

Her two major theoretical papers were the fruits of considerable search and research. "The Political Economy of Women's Liberation" was published in 1969, "Feminism and the Critique of the Scientific Method" appeared in 1982. Since Angela Miles recalls the impact of "The Political Economy of Women's Liberation" in this volume, I would like to reflect on the seminal nature of "Feminism and the Critique of Scientific Method."

When this paper first appeared, Maggie had been at Simon Fraser University for fifteen years. At this time she held a cross-appointment in the Departments of Chemistry and Computer Science. On its initial publication, "Feminism and the Critique of the Scientific Method" did not have the same instantaneous impact as did "The Political Economy of Women's Liberation." Maybe this was due to the fact that at the time those involved in arguments about the structure of scientific knowledge did not consult a book with the title "Feminism in Canada."

To the best of my knowledge, the paper was never translated into another language, although it became a central contribution to the debate on the nature of science and on the intrinsic limitations of the scientific method. You will be familiar with this rich discourse on the social and political structuring of knowledge, to which feminists have added so many fresh insights, and therefore, you may ask about Maggie's place in all this...

For me, the importance of Maggie's work here is two-fold. In the first place she explores, explains, and illuminates the notion of science in all its aspects. Secondly, she draws practical consequences from what she and others found and she acts upon them in her own work.

Like a good anatomist, Maggie first dissects the concepts and practices of science, using the instruments of a feminist and socialist analysis. She looks at science as a social and political structure and finds it wanting, in the same way in which she found economic systems wanting when she critiqued the political economy of women's liberation. Maggie lays bare for all to see the postulates and assumptions, the methods of work and the internal reasoning within the enterprise of science.

This *pedagogy of understanding* is embedded in all of Maggie's work. A particularly telling paragraph will illustrate what I mean. Speaking of the core assumptions of scientific practices, she writes:

These assumptions are:

- 1) There exists an "objective" material reality separate from and independent of an observer. This reality is orderly.
- 2) The material world is knowable through rational inquiry

and this knowledge is independent of the individual characteristics of the observer.

3) Knowledge of the material world is gained through measurement of natural phenomena: measurement in a scientific sense consists of quantification, i.e. reduction to some form of mathematical description.

4) The goal of scientific understanding is the ability to predict and control natural phenomena (this postulate often takes the form of equating science with power).

Interweaving her analysis with the insights of other feminist scholars, notably Ruth Hubbard and Marian Lowe, Maggie then exposes the double myth of the objectivity and neutrality of the scientific method, pointing out the inherent limitations that the methods of science place on the scope of any scientific inquiry. The impact of reductionism, this pre-ordaining of certain variables as being more important or indicative than others, becomes the next focus of her pedagogy of understanding. She quotes Ruth Hubbard in this context:

...of necessity, we can tackle only the few limited aspects of nature of which we take sufficient notice that they arouse our interest or curiosity to the point where we examine them more closely. The scientific modes of thought and action therefore elevate some things and events to the rank of "facts," indeed of *scientific facts*, while being oblivious to the existence of others and actively relegating yet a third category to the foggy realms of suppositions or, worse yet, superstition.

Ruth Hubbard elaborated later on the role of scientists as socially sanctioned "fact-makers." You will find more on this in Ruth Hubbard's book, *The Politics of Women's Biology*.

There are other thoughts in "Feminism and the Critique of the Scientific Method" that will be of special interest to you, Marcia. In terms of the impact of reductionism and bias in scientific practices, Maggie points to the notion of "side effects" and writes:

In fact, there are no side effects, only effects. The definition of some of the results of the process under study as unimportant is done in terms of the intent of the investigator rather than the reality of the process. The "pill" is a good example—suppression of ovulation is one of its effects, while another is a change in blood chemistry that may make blood clotting more likely. A less distorted methodology would not dismiss this second effect as lightly as present medical science does.

Have you noticed, Marcia, that Maggie speaks throughout the paper of *present science*? She explains her terminology in a

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footnote, stating "I use the term 'present science' to refer to the methodology and practice of science *now*, since I believe that ultimately feminist and other critiques will lead to a quite different conception of what science can be." Maggie uses the term *present technology* in the same manner.

There are many indications throughout the paper that Maggie was not giving up on science, but was pressing for work on a different science. The paper's final section is actually called "Towards a different science." Quoting Ruth Hubbard again, Maggie writes:

As women and as feminists we must begin to deal with the science and technology that shape our lives and even our bodies. We have been the objects of bad science; now we must become the makers of a new one.

What is needed in such a new science is, first of all, a sense of the limits of the appropriateness of reductionism and the development of a methodology which can deal with complex systems "that flow so smoothly and gradually or are so profoundly interwoven in their complexities that they can not be broken up into measurable units without losing or changing their fundamental nature." Difficult as this may be in practice, its very adoption as a goal must mean a major change in scientific methodology.

And this is precisely what she did in all her own projects and studies: conducted scientific or technical studies using new and different methodologies reflecting her own different values. The fact that these studies had realistic goals and practical results—be they new designs of computer networks or a novel way of automating clerical work—should not camouflage the emergence of radically different methodologies. Please, Marcia, don't let the down-to-earth attributes of Maggie's projects blind you to their *theoretical* importance; each one is an experience, testing the methodologies of a new contextual science.

Vividly imagining the new and cultivating constructive dreaming were important to Maggie. Did you know that she had a great deal of interest in science fiction and in utopias, particularly in the feminist ones? She taught several courses on utopias, emphasizing their different sciences and knowledge structures as well as their novel social relationships. Her 1988 paper on "Feminism and Systems Design: Questions of Control" begins with reflections on Marge Piercy's utopian novel *Woman on the Edge of Time*. For Maggie, science fiction and utopian writing provided a space where the social and the scientific imagination could meet

and play. Had she lived longer, she might well have written in this genre too.

But now I must return to your initial question, whether there is a place for a young feminist in science. My answer is clearly "yes," although you and other women should understand the political and social structure of present science and technology and try to become equipped to deal with this reality. However, this need for an understanding of the political and social structure of the enterprise in which one invests one's labour is not required only from those who prepare for work in science and technology. If you were to go into law or medicine, social work or architecture, the same questions about assumptions and paradigms would exist, although some disciplines might be more prepared to face such queries than is present science and its practitioners. Maggie certainly was not prepared to give up her participation in the practice of science or technology. In "Marxism, Science and Workers' Control" she said quite explicitly: "In general, I don't want to be understood as being 'anti-rational' or 'anti-science'." What I argue is that it is necessary to recognize the problems inherent in the present practice of science." And, she could have added, do something about it.

Let me assure you, Marcia, that I know how constrained the choices for graduate students in terms of research subjects and supervisors have become in these tough times. Yet there are choices and they have to be made with care. Choose your supervisors, if you can, for their human qualities; you must be able to respect them, even when you have to disagree with them. To me, considerations of human substance are of greater importance than the selection of a sub-discipline.

Among the research areas open to you, choose, if at all possible, one that has been neglected because of the very biases Maggie discussed. For instance, in the field of solid state physics, we both know, that the past fifty years of concentrated research have yielded a very complex and complete body of knowledge related to the interaction of solid inorganic material and radiation and currents of any kind. Without this body of knowledge, there would be no semiconductors, no microchips, no fibre optics—you name it. Now compare this situation with the very small body of uncertain information regarding the interaction between living organic solids—blood, tissue, cells or bone—and the same currents and radiation. Isn't it amazing how little research effort and attention the organic materials have attracted?

Unquestionably, the experimental context is more complicated and "messy" for organic materials, i.e. less amiable to reductionist simplification; but most problems look complicated and messy until one has a conceptual handle on them. You may

want to ask yourself too whether the neglect of this research area could have a political component. The beneficiaries of the neglected sub-field would likely be, in the main, 'mere' people, while the present solid state knowledge has yielded enormous industrial and military benefits. Here is clearly an area of inquiry that is crying out for the new methodologies, for new forms of collaboration and data gathering. Try to associate yourself with those who worry about such neglected fields, as Maggie always did.

Let me also urge you not to forget how much joy the study of science can give. The world in which we live is rich and full of wonder and beauty, as Rachel Carson so often said. Can you recall the feeling of sheer joy when you grasped for the first time the underlying reasons for the regularity of the periodic table of elements or the nature of crystallographic transformations? I certainly can, and even now, some forty years after my Ph.D., I still find microscopic examinations of samples a joyful and wonderful activity.

There is the joy of mastery and understanding—not at all unique to scientific studies—the pleasure of seeing patterns emerging where none were seen before, the elegance of a fresh mathematical approach—all these treasures are there, and should not become invisible because of the shadows that the over-reach and over-application of *present* science and technology have cast.

Yes, you may say, all this is fine and good, but what about the 'chilly climate'? Good question! I do acknowledge that the structurally and—at times—personally unfriendly environment deters young women from planning research careers in a scientific or technical field. Yet, as a feminist, you are less vulnerable than young women who have no understanding of the social and political structures of science and technology, and who might still fall for the myth of the objectivity and neutrality of science and technology.

You may think that I am joking, but let me give you my argument: first and foremost, don't check your feminism at the laboratory door, it is an important layer of the coat of inner security that will protect you from the chilly climate. As your values will be questioned constantly—implicitly and explicitly, you will depend for your sanity on an ongoing rootedness in the women's community, as Linda Christiansen-Ruffman points out in these pages.

Take the time to keep involved in women's issues and don't ever believe that you are "the only woman in...". Likely you are not, just as I have never been. Wherever men work, there are women working, usually for much lower pay. You may well be the only female doctoral student in a particular group, but what about the secretaries, the cleaning staff, the librarians or the technicians? You may link up with them and gain their support and friendship. As you watch over the safety and well being of others, your own will take care of itself and the chilly climate will warm up a bit.

Don't become petrified by rank! Only hierarchy pulls rank; as feminists, we see rank as the institutional equivalent of a postal code, not as a figure of merit. In other words, rank or title tells of people's sphere of work and responsibility, not that—by definition—they know more or know better than those of lower rank or title.

Remember also that what is morally wrong and unjust is, in the end, also dysfunctional—a point Maggie made often. All the advanced science and technology for war has not brought peace to anyone. All the advanced systems of oppression have not brought security to their owners. As a motto for her paper on technology as language, Maggie used a line from a postcard of the International Women's Tribune Centre: "If it's not appropriate for women, it's not appropriate"—a good phrase to remember.

And finally, when the going is tough and you feel yourself surrounded by jerks, take an anthropological approach. Take field notes (and I mean this in real and practical terms) and regard yourself as an explorer, having come upon a strange tribe. Observe and describe the tribe's customs and attitudes with keen detachment and consider publishing your field observations. It may help you and be of use to future travellers. I know from experience that the exercise works.

Please keep in touch and remember, you are not alone.

Your friend,
Ursula Franklin

Ursula Martius Franklin, University Professor Emerita, University of Toronto, holds a Ph.D. in experimental physics from the Technical University, Berlin and taught in the Faculty of Applied Science and Engineering for more than two decades. She is the author of The Real World of Technology and was a long time friend of Margaret Benston.



Photo: Pat Davitt