

204 Founders College, York University  
4700 Keele Street, Downsview, Ontario M3J 1P3  
Telephone (416) 667-3725

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# Editorial

*Ursula Franklin*

Out of the richness of the contributions to this issue, one can recognize clearly two themes and their variations.

In the major key, so to speak, is the affirming theme that says simply: Women have made notable contributions to science and technology in the past. Their numbers may be increasing now, but there are still major barriers to the appropriate education, the adequate employment, and promotion of women in this area. We know what needs to be done to integrate women into science and technology. Let's press forward together and see to it that the barriers are removed.

And then, in the minor key, one hears the questioning theme. It says look, science and technology as establishments – in contrast to science and technology as intellectual and practical activities – are hierarchical, highly competitive, and power-driven. Is it really so that conforming to the rules of these establishments is the only way for women to enjoy training, employment, and success in the fields of science and technology? Does not the past exclusion of women point to the need for *change*, not so much in women but in the thrust, purpose, context of science and technology? Shouldn't women be welcomed into these fields *because* they are women rather than *in spite* of the fact that they are women?

As these two themes complement and reinforce each other, a third theme becomes discernible – much less defined as yet, but a clear development of the two earlier ones. This third theme appears to say: Don't let yourself be defined by patterns set in the past or get trapped in an either/or situation. New patterns are already emerging; just look at what's actually going on.

And so it is. While educators hold conferences and write papers on how to teach science to the young, how to fight math phobia in girls, women often with no previous formal training in science acquire sophisticated knowledge and understanding of scientific and technological matters in the setting of their own community. Motivated strongly by the needs of social action, a non-competitive process of teaching and learning among equals is taking place under our own eyes. The results are often most remarkable; citizen scientists emerge who stand up well in the confrontation or comparison with the traditional experts.

Briefs and submissions of citizen groups, interventions and cross examinations at hearings provide massive evidence of the competence and scope of citizen scientists. A network of knowledge and trust is being developed outside the established channels. Only the myth that the only "real" knowledge is certified knowledge has kept people from recognizing the effectiveness of science teaching in the community. Freed from the competitive stresses of school-like situations and occurring among strongly motivated teachers and learners, this system of learning from each other has produced astounding results of professional mastery in very short periods of time.

Women ought not to be surprised by this. They have usually learned from each other by freely giving and accepting knowledge and experience.

Why should such a system not work for science and technology? What matters here is not the content but the non-threatening relationship between the provider of special knowledge and the receiver. There is nothing sacrosanct or taboo about the knowledge of science or technology per se.

What is sacrosanct is the power derived from the exclusive ownership of this special knowledge. Which brings us back to the old subject of women-power and exclusion.

It is because the citizen scientists begin to break the stranglehold of exclusion and power on matters related to science and technology that I find so much hope in their emergence. Let us then develop and enrich our third theme so that the two other themes may become, as time goes on, background to a new and different pattern, in which women study, develop, and use science and technology.