The Citizen Scientist: What She Didn't Learn in School

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Devenir non pas scientifique, mais citoyen scientifique, c'est un phénomène de transformation que l'on observe chez beaucoup de femmes (et d'hommes). Ce processus s'effectue presque totalement en dehors du contexte traditionnel académique ou institutionnel. Des milliers de personnes de nos jours revendiquent le savoir scientifique pour protéger et conserver ce qu'elles chérissent.

Kitchen tables with babies crawling underfoot. Schoolrooms after hours where the desks feel too cramped for an adult body. Community halls and church basements. Hours and hours of group meetings where there are always more women than men. More hours spent at the copying machine and on the telephone. No expensive apparatus or laboratories. No degree-granting programs or grants. Most of us have little traditional scientific or technical background. Yet we are gathered together to exchange scientific and technical information.

Our need to understand this information is urgent. We need to know the short and long-term health and environmental effects of the particular herbicide which the forestry companies want to spray this year on Nova Scotia forests. We need to know about the consequences of uranium mining in a small province where uranium deposits are close to human settlement and agricultural land and in watershed areas.

The media calls us "environmentalists." The provincial government and the company men call us hysterical, ignorant, and subversive. The federal government calls us ENGOs – Environmental Non-Government Organizations, meaning we are not funded by them.

This lack of funding renders us particularly suspicious in the eyes of the company men and politicians. They cannot believe the simple truth: we fund our work from our own pockets, from the proceeds of bake sales, flea markets, and benefit nights.

This method of funding is also alien to the scientific "experts" brought in as consultants by the companies and government. These "experts" are highly paid for their expertise and they regard the citizen groups as the antithesis of themselves, that is, as ill-informed, irrational, emotional, and non-scientific.

What they and the others fail to recognize is that we are really citizen scientists.

The need for this new type of citizen and scientist is usually generated by a specific issue. The debate over the location of a new town dump, for example, has spawned more self-taught "experts" on recycling alternatives and design safety and efficiency of incinerators than the engineering program at the local technical university.

Such issues motivate the citizen whose first reaction is usually one of backyard resistance – what the federal government calls the NIMBY (Not In My Backyard) syndrome. The trigger could be the dump, toxic waste, spraying, or uranium mining. The perceived threat is to the "home" territory and that is where women are quick to react. Whether by nature or nurture, we seem to be highly sensitive to changes in our environment and often we question where men will take things for granted.

These first questions are a deceptive beginning for our novice citizen scientist. She thinks she will simply have to do a little background research and attend a few public meetings where the "experts" will answer her questions and allay her anxieties.

The struggle begins when our citizen realizes she has to become a citizen scientist. When she is confronted by the huge and complex technical literature on most of these issues, her first reaction is usually one of panic. She hasn't

been trained in this area; she has no qualifications. And who would have thought that *radon daughters* was not a familial complex but the decay products of radon gas, itself a decay product of uranium? Who would have thought that ground water tables could become such a vital factor in her life?

Through persistence she gradually starts to recognize landmarks in this unfamiliar territory. She realizes also that it is important to belong to a group. What she can't understand on her own is made more comprehensible by discussing it at meetings where other citizen-cum-scientists report on their reading, where charts, maps, and graphs are shared, articles copied and passed on.

By the time she goes to the public meeting to listen to the "experts," our citizen scientist has done her homework. She has some knowledge and this gives her the confidence at least to ask questions. To her surprise, the "experts" do not answer these questions as she expected. Having read several articles, for example, on the toxic effects of dioxin, she asks a question about the health effects of spraying a herbicide containing dioxin contaminant. The forestry company "expert" swears that the low-level concentrations used for spraying the herbicide render it as safe as aspirin. Our citizen scientist then asks: What about such-and-such a study? The "expert" sneers. *That* study was not correctly conducted and more recent work suggests . . .

So our citizen scientist learns that the "experts" disagree and that this part of an ongoing debate within the scientific community. The problem is that our citizen scientist belongs to a different community, or, more precisely, she is perceived by the scientists as belonging to a different community where scientific issues interface with political, social, and economic life. When the AECB (Atomic Energy Control Board) says it will take at least ten years to begin to address the problems of long-term management of uranium tailings, our citizen scientist cannot sit back and wait for that research to be done. Tomorrow or five years from now, there may be a uranium mine in her backyard.

At this point, our citizen scientist confidently asserts the power of common sense. If these aspects of the issue are still under scientific debate, surely the best answer would be to take a conservative position and suspend spraying or uranium mining or whatever, until we know more about the consequences.

To her amazement, the company men and politicians then accuse her of being a Luddite (an ignorant protester against technological advances), of wanting to go back to the caves, and of obstructing progress.

She begins to understand that neither science nor common sense has little to do with the unexamined passion for development so dominant in our culture. She hears the word "sexy" thrown into discussion in a peculiar manner. One day she hears a radio interview about offshore development of gas and oil. The executive being interviewed says: "Oil is sexier than gas." What does this mean? The gas reserves have already been discovered. Gas could help Nova Scotia become energy self-sufficient. They are still drilling test wells for the oil which will, in any case, be more expensive. Why then is oil sexier than gas?

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It dawns on our citizen scientist that "sexy," to the male consciousness, connotes high profits, glamorous jobs, and power. Conversely, the conserver/conservative position lacks sex appeal.

By now our citizen scientist realizes that the struggle she is engaged in is neither scientific nor simple nor brief. The scientific "experts" disagree, yet the company men and the politicians want to push on with their development plans regardless of the consequences. They even begin to hire PR women as the spokespersons to address these reluctant groups of citizen scientists, apparently on the theory that the real objection is to the male identity of the spokesperson and not to what he is saying. The other theory which surfaces from both government-controlled agencies and departments and from the transnational companies is that the whole problem, from their point of view, is due to bad PR and media coverage. They blame our citizen scientist for her manipulation of the media and her distortion of the facts.

There comes the time when our citizen scientist suffers from burnout and discouragement, if not disillusionment. She has run out of money, time, and energy; her personal life is probably a mess and her citizen group feels the same way.

What has she gained?

Knowledge of two kinds: scientific and political. And the important insight, often denied by conventional scientists, especially "experts," that one type of knowledge is inextricably mixed with the other. In the experiential realm where every citizen has her being, there is no such thing as pure Science, and objectivity becomes a relative matter.

She has gained skills and confidence in her ability to act and assert her right to participate in the decision-making processes of her community, her country, and the world. She has learned that she is not powerless and can be effective and that she is connected, in a most intimate manner, with the rest of the world.

In other words, she has gone through a radicalizing process, a raising of consciousness which has nothing to do with the fact that she almost failed first-year chemistry. As a citizen scientist she is now sceptical of authority, both political and scientific, and yet she values intellectual honesty and accurate information. She is no longer intimidated by the scientific and technical aspects of an issue and knows that she has a vital contribution to make to such discussions and debates.

The amazing thing is that this transformation has taken place almost entirely outside the traditional academic/institutional context which still seems to be producing Scientists rather than citizen scientists.

And our typical citizen scientist is not alone. There are thousands like her, women (and men) reclaiming scientific knowledge on our own territory to protect and preserve what we cherish. With this knowledge we can save the world – if we have the time.

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