

Demystifying Science: not an easy task

by John L. Roeder

There are healthful reasons to eat fish. But there are also concerns about the level of PCBs (PolyChlorinated Biphenyls) they contain. And, as Dr. Joe Schwarcz went through similar considerations about a long list of products we eat or use in our daily lives in his presentation to the Physics and Chemistry Teachers Clubs of New York at New York University on 1 December 2006, he was left with the conclusion that in order to have a long life, one would have to be hungry, dirty, and smelly.

But then came his rejoinder: none of the "scares" he had cited referred to any numbers. "Numbers are important," he emphasized, noting that in the case of most contaminants of products we eat or use, the level of their presence is usually below the threshold of concern. Informing the public about the significance of these numbers is one of Schwarcz's mission as Director of the Office for Science and Society at McGill University, Montreal, Canada <<http://oss.mcgill.ca>>.

The McGill Office for Science and Society seeks to demystify science for the public, Schwarcz said. One of the ways he has been doing this is to answer questions about science from the public on radio station CJAD at 3 p.m. Eastern Time on Sundays since 1980 (listen on line at www.cjad.com). People are most interested in science that relates to their own life, he added, recalling one listener who was concerned about the presence of sodium tripolyphosphate in a cleaning product and, once reconciled to the value of its use in cleaning products, was later disturbed to find it as an ingredient in bread.

Scientific illiteracy is rampant, Schwarcz went on, and chemicals are equated with toxins. "Natural" is preferred, in spite of an abundance of "natural" organisms that are poisonous. On this issue Schwarcz singled out Kevin Trudeau, whose book, *Natural Cures "They" Don't Want You to Know About*, seeks to convince the public that the corporate world has duped the public, while Trudeau himself is doing the same thing. Schwarcz pointed out that the Federal Trade Commission has banned Trudeau from selling "natural cure" scams, but that the first amendment to the U.S. Constitution precludes banning the books he writes.

Nor is Trudeau the only charlatan to be wary of. Schwarcz also cited Harvey and Marilyn Diamond and their book, *Fit for Life*. He also lamented that those pursuing cures proclaimed by charlatans were also avoiding efficacious treatment.

Some products promoted by charlatans can also be harmless and even humorous. One example was the Danish Water Revitalizer, a curved water pipe designed to restore "dead" water molecules whose bond angle had been reduced to 101° by L-shaped pipes. Another was an electrolysis device which claims to take toxins from feet soaked in it: the "removed toxins" are a rust-colored ferric hydroxide solution generated by the device.

Communicating about science to the public is a big and important task, Schwarcz concluded, and most practicing scientists are not good at it. Climbing on a higher soapbox than the charlatans is important, he said, but more important is educating people -- he said that students in his organic chemistry class know better than to ask whether natural vitamin C is better than synthetic. Schwarcz emphasized the importance of evaluating "authorities" in terms of the legitimacy of their academic background and whether they have a financial stake in what they advocate. He recommended *New Scientist*, newsletters published by Consumer's Union, Harvard, and Berkeley, and Steven Barrett's website <www.quackwatch.org>.

Schwarcz also had a serious message about transfat to present, and he called on Melody Ko, one of his assistants, to present it. Introduced as a better alternative to saturated fats, which create higher levels of LDLs (low density lipids, known commonly as "bad cholesterol"), transfats are unsaturated, in that they have adjacent carbon atoms connected by double bonds, but with the hydrogen atoms bonded to this pair of carbon atoms on opposite sides (as opposed to the same side) of the carbon chain rather than on the same side. But it turns out that transfats also raise the level of LDLs -- and also lower the levels of HDLs (high density lipids, known as "good cholesterol"). Thus transfats are "twice as bad" as saturated fats. All food labels must now list the amount of transfats, and most of the pastries we like (and should limit in our diet anyway) are rich in them. Unsaturated oils like olive and canola are the best for our health, but because they break down upon heating, they cannot be reused, and this presents a problem for restaurants.

The day after Schwarcz's talk I decided to do a little "research" at my local public library (Mercer County, NJ) to check on the availability of Schwarcz's books, also those by Trudeau and the Diamonds. I found three of the books listed on Schwarcz's website available -- *Dr. Joe and What You Didn't Know* (2003), *Radar, Hula Hoops, and Playful Pigs* (1999), and *The Way the Cookie Crumbles* (2002) -- but that they would have to be provided from the Mercer County Community College Library. On the other hand, Trudeau's book was available in several public library branches, and a copy of his just-leased *More Natural "Cures" Revealed: Previously censored Brand Name Products That Cure Disease* had recently been acquired. Likewise, *Fit for Life* (in both the original 1985 and updated 2000 versions) were available at several branches, along with a more recent *Fit for Life, not Fat for Life* (2003).