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Chair

Mr. Bob Mills

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● (1540)

[*English*]

The Chair (Mr. Bob Mills (Red Deer, CPC)): I call this meeting to order.

First of all, to our witnesses, welcome, and we look forward to your interventions.

We do have a bit of committee business first, and I apologize if it takes a bit longer than what we had hoped. But because several members are going to have to leave shortly, near the end of the session, we have agreed that we would deal with this committee item first. So if you can relax, we will be with you very shortly.

Committee members, I think you all have the motion put by Mr. Cullen on the back of the agenda. We would intend to deal with that motion at this point.

Mr. Warawa.

Mr. Mark Warawa (Langley, CPC): A point of order, Mr. Chair.

Thank you, Mr. Chair.

I'll be moving that this motion is out of order. With your permission, I would like to present my reasons why.

The Chair: Mr. Warawa, the clerk advises me that the motion has to be on the floor, and then you can make your motion.

Mr. Mark Warawa: Sorry, I thought the item on the floor at this point was the motion. Did I misunderstand?

The Chair: If you could formally move it, Mr. Cullen, then we could enter into debate.

Mr. Nathan Cullen (Skeena—Bulkley Valley, NDP): I'd like to move this motion, Chair, and I appreciate the time of the committee.

I think it's important for those present today, without the motion in front of them, to hear the details of the motion. It's with considerable regret, frustration, and due process that this motion has come before us today.

I'll read it in detail, and then we can get into the debate as quickly as possible. It reads:

> That because the Minister of the Environment has: 1) indicated in Bonn that Canada would not live up to its international obligations under the Kyoto Protocol; 2) refused to address the municipal mayors and councillors of the Federation of Canadian Municipalities assembled in Montreal in June, 2006; 3) been the first Federal Minister of the Environment to refuse to attend the annual Smog Summit in Toronto; 4) refused to appear before this committee in spite of a standing and open invitation; 5) tabled no plan for Canada to reduce Greenhouse Gas Emissions or to address Canada's pollution problems; 6) done nothing to stop the regressive cuts to beneficial environmental programs such as EnerGuide for Houses Retrofit Incentive Program and for Low-Income Households; 7) implemented no single measure to conserve or protect Canada's environment to date

The final motion reads:

> That the Standing Committee of the Environment and Sustainable Development call on the Government of Canada to dismiss the Minister of the Environment from her current cabinet position and that this decision be reported to the House.

For those committee members who have worked with me in the past, I'm not one to deal with serious issues lightly. It's been an incredibly frustrating experience, both through question period and our inability to receive answers to questions that are significant to Canadians from coast to coast to coast, with respect to climate change in particular, but other issues in general.

At the base of this argument is a basic accountability that we as parliamentarians must demand of the government. In previous administrations and in the current one, other ministers have made themselves available to committee, particularly when the request has been forthcoming. Quite frankly, with such a critical issue facing Canadians today—and that is, of climate change and increasing pollution—there simply must be a minister who is willing to answer questions of their colleagues, answer questions of Canadians, and put forward a reliable climate change plan.

Clearly we've waited far too long for this.

Thank you.

● (1545)

The Chair: Mr. Warawa.

Mr. Mark Warawa: Thank you, Mr. Chair.

At this point, I would like to move that the motion on the floor is out of order at this time. With your permission, I'll give the reasons why.

Thank you.

Mr. Chair, this government has the mandate to deal with CEPA, the Canadian Environmental Protection Act of 1999. It is the cornerstone legislation on the environment, which as a committee we have agreed to deal with.

Mr. Chair, if we think back to the Speech from the Throne, this government committed to achieving tangible improvements in our environment, including reductions in pollution.

In the speech, the Governor General of Canada stated:

> Recognizing the important role of parliamentarians, members of Parliament will be asked to conduct comprehensive reviews of key federal legislation, including the Canadian Environmental Protection Act.

Mr. Chair, this committee did agree that this would be our number one priority, as we would then start to do the review of CEPA 1999. Mr. Chair, this is what the committee should be focusing on.

This motion from the NDP wastes committee time and is distracting the committee from the CEPA review. The motion also seeks to waste parliamentary time in the House.

The Chair: I'd ask that rather than going on to debate, you conclude. Then we'll open it for debate.

Mr. Mark Warawa: The salient point is that the Government of Canada does not have the authority to dismiss ministers; the Prime Minister has that authority. That's the fundamental reason why this is out of order and also why I believe it's political mischief.

The member did say that climate change and pollution are critical issues. We believe they are. I believe that what we see today is political mischief, not a genuine intent to deal with the issues.

The Chair: Thank you, Mr. Warawa.

Mr. Bigras.

[*Translation*]

Mr. Bernard Bigras (Rosemont—La Petite-Patrie, BQ): Thank you, Mr. Chairman.

What are we debating, Mr. Cullen's motion or the question raised by Mr. Warawa? Are we discussing Mr. Cullen's motion?

[*English*]

The Chair: Yes, we're on the debate of Mr. Cullen's motion.

[*Translation*]

Mr. Bernard Bigras: All right.

[*English*]

Mr. Nathan Cullen: On a point of order, then, if there's been a challenge to the motion, as to whether it's in order or not, is it not procedure to rule on it?

[*Translation*]

Mr. Bernard Bigras: Mr. Chairman, before starting the debate, I would like to clerk to tell us whether the motion is in order or not.

The Clerk of the Committee: The motion is in order.

Mr. Bernard Bigras: The motion is in order. Thank you,that solves the issue raised by Mr. Warawa, the parliamentary secretary.

On the substance of the issue, I would like to say that the Bloc Québecois will vote in favour of this motion put forward by the New Democratic Party. On a number of occasions, in this committee, we indicated to the government that we wanted the minister to come here and explain her vision for the future with regard to environmental protection and particularly the Kyoto Protocol.

Mr. Chairman, I would like to remind you that the House of Commons has recently adopted a motion requesting the federal government to table a plan to achieve the green house gas emission objectives provided for under the Kyoto Protocol. Moreover, the opposition has often asked the Minister of Environment whether she intends to incorporate the Kyoto objectives into her future plan.

We can only conclude today that the government has declined to satisfy the wishes of the House. Moreover, the Minister has refused to appear before the committee although she was free and had ample time to do so.

I believe that the motion presented by my NDP colleague is justified and should be supported by this committee. That is my wish and that is the position we will state in today's vote.

● (1550)

[*English*]

The Chair: Thank you, Mr. Bigras.

Mr. Godfrey.

Hon. John Godfrey (Don Valley West, Lib.): I'm a little confused by what you just said to Mr. Bigras; you said that Mr. Warawa's motion is out of order.

The Chair: No, I said that Mr. Cullen's motion is in order.

Hon. John Godfrey: Does it take precedence? It would be moot for Mr. Warawa's motion to be debated after we'd voted on the main motion. I'm just a little puzzled as to which thing we vote on first and whether Mr. Warawa's takes precedence over the debate on the main motion.

If we don't resolve the question that Mr. Warawa's putting to us, then it won't matter if we've already debated the issue, because it will have gone past.

The Chair: Mr. Godfrey, basically I think what we're trying to do is to clarify the position on this.

Mr. Cullen's motion is in order. Mr. Warawa's motion is basically part of the debate. Each person then has the ability to enter into this debate and give their point of view, as has been done by Mr. Bigras and will be done by other members. At the end of the day, we will take a vote on that.

Mr. Mark Warawa: I have a point of order, Mr. Chair. Procedurally, I have a motion on the floor questioning whether or not this motion is in order. Mr. Chair, you have ruled that it is in order, but the motion then is challenging the position of whether or not it is in order. I could go on at length.

In my opinion, the way I read procedure is that it is not in order, and I gave my reasons, Mr. Chair, but the motion on the table at this time is my motion, and whether or not it's in order. That needs to be voted on before we can proceed and debate the orginal motion.

The Chair: I would like to explain the ruling that I have in terms of Mr. Cullen's motion. I have checked with the clerk; I have checked with the Speaker of the House. The Speaker of the House advises me that this motion is in order; the clerk advises me that it is in order. However, obviously we can now debate the issue as to whether your part of the debate....

Mr. Nathan Cullen: I have a point of order. You can't table a motion without notice. We can't debate this motion. If this has been deemed in order, then it's been deemed in order. We simply cannot....

The Chair: This is part of debate, I believe, Mr. Cullen, and that's exactly what we're doing. We're listening to the views of members regarding your motion.

Mr. Nathan Cullen: True, Mr. Chair, but with all due respect to the chair, committee members cannot, without unanimous consent, introduce a motion at committee. It must be done within 48 hours.

The Chair: What Mr. Warawa is doing is challenging that this is in fact a legitimate motion. He's challenging that.

Mr. Vellacott.

Mr. Maurice Vellacott (Saskatoon—Wanuskewin, CPC): Mr. Chair, at this point, procedurally, I believe I'm in order to do this. With due respect to our clerk here—and to many years in that role—and to you as well, you have ruled in view of the advice you had from the Speaker and the clerk of the committee that the motion is in order. I want to challenge your ruling now, which has to be put to a vote. I would differ with your ruling, and we need to go to a vote in terms of overturning your ruling. I appeal your ruling, and that requires a vote by the members of committee.

● (1555)

[*Translation*]

Mr. Bernard Bigras: On a point of order, Mr. Chairman.

[*English*]

Mr. Maurice Vellacott: Mr. Chair, I think what I have proposed is in order. I have challenged the ruling of the Speaker, who said the motion was in order. I have challenged that, and now we have to go to a vote in respect of this.

The Chair: I accepted the advice of the clerk and the advice of the Speaker of the House, and I stand by that advice.

Mr. Maurice Vellacott: I challenge your ruling, and we have to vote on that.

The Chair: Correct. So we have to vote on that.

Yes?

Mr. Nathan Cullen: Point of order. That's absolutely exceptional, coming from members who claim not to wish to waste time. As a procedural piece of this, by the directive of your own members of the party, you can't occupy the chair during such a vote. If the chair is being challenged.... Read the book. If the chair is being challenged, you cannot occupy the chair during that vote. This is not obviously a directive at you; it's just an incredible waste of time that we're going through here.

The Chair: I can call one of the vice-chairs; we have two here.

Mr. Maurice Vellacott: No, stay in the chair. The chair stays in the chair during the time of the challenge. When you've been challenged the chair stays in the chair.

The Chair: The clerk says I stay here. I'm here. Let's vote on the challenge.

Those who agree with the challenge to the chair's decision that the motion is in order....

What we're challenging is the decision that this motion is in order.

[*Translation*]

Mr. Bernard Bigras: Could we have a debate before voting? No debate! This is setting a dangerous precedent.

[*English*]

Mr. Maurice Vellacott: So we vote against upholding your ruling, and I guess they would vote for. Right?

The Chair: Those who are in favour of my ruling that Mr. Cullen's motion is in fact in order, and those who are opposed to my ruling—that's what we're voting on.

(Chair's ruling not sustained)

The Chair: Mr. Bigras.

[*Translation*]

Mr. Bernard Bigras: Mr. Chairman, there may be precedents, but I think the committee has just made a crucial decision.

In my opinion, the committee has just withdrawn its trust in the Chairman, and I think there must be consequences. This decision is challenging the Chair over a fundamental issue. I wonder even if we can continue to sit today, given the circumstances.

Personally, would not take the chair under such circumstances. I don't know who can enlighten us, but it is highly likely that we will have to elect a new Chair before proceeding further. A decision by the Chair has just been challenged, it seems clear to me. I think that when a motion is moved and that motion has been checked by the Speaker of the House, by the clerk...

[*English*]

The Chair: Mr. Bigras, the vote was on the decision, not on the chair; that's how I interpreted it.

[*Translation*]

Mr. Bernard Bigras: It concerns, in fact, the Chair's decision.

[*English*]

The Chair: It was on the decision that I accepted the Speaker's and the clerk's advice. Obviously, I think we move on to the witnesses who are here. Mr. Bigras, I'd be glad to talk to you after.

[*Translation*]

Mr. Bernard Bigras: We will talk about it later, but by challenging your decision, we have, no more no less, challenge the committee chair's decision, a decision made in accordance with the advice provided to you by the Speaker of the House.

[*English*]

The Chair: Order.

Mr. Bigras, I think you've stated your opinion; it is an opinion and we've all heard it. As I say, you and I can discuss that later.

I'd now like to officially come back to our witnesses and welcome you. I think you've witnessed an interesting part of democracy that does occur—that's Ottawa. Anyway, I would like to call on our witnesses. I believe we can start with Mr. Schwarcz.

● (1600)

Dr. Joe Schwarcz (Director, Office for Science and Society, McGill University): Thank you.

I think I was asked to come and speak to you here today because of an article I wrote in the *National Post* where I expressed some opinions on Environmental Defence's activities.

I direct an office at McGill called the Office for Science and Society, and our role is to educate. We don't tend to try to influence policy. We don't advocate, we educate. Let me give you a glimpse into what it is that we do and why I was asked to come here.

If you'd come with me just for a moment to the forest of South America and take a look around, you might see a monkey hanging from a tree and all of a sudden an arrow flies through the air and the animal is hit, but he jumps from one tree to the next tree and to the third tree before he collapses to the ground. He has been hit by what we call a three-tree poison. The substance was a chemical called tubocurarine. It's a substance that is isolated from a naturally occurring vine that grows on a tree. This same substance in 1942 was introduced into medicine by Dr. Harold Griffith, in Montreal actually, at the Queen Elizabeth Hospital, and it's made a tremendous impact on anesthesiology, because it reduces the force of contractions of the abdomen when a surgeon slices into it.

This makes several points: one is that the dosage is extremely important; two, that naturally occurring substances can be extremely toxic; and third, that a substance can be either used as a poison or as a drug, it all depends on how we go about it.

The same thing goes for synthetic substances. Consider an aspirin tablet. Many of us take a small dose every day to prevent heart disease, but if you swallow a whole bottle of aspirin, of course it is possibly lethal. So we ask the question whether or not aspirin is a toxic chemical, and to have an answer to that question we turn to the science of toxicology, which really is the study of the effects of chemicals on living organisms. It is a tremendously complicated area of study. The anthem of this area of study goes all the way back to Paracelsus in the 15th century, who gave us the term *sola dosis facit venenum*. For those of you who have forgotten your Latin, I'll translate that. It means “only the dose makes the poison”, and that indeed is the anthem of toxicology.

The main principle is that there's always a dose response curve, as you see here, in toxicology. With increasing dose, we see increasing effects. The question comes of what happens way down here at the bottom of the curve. Do the effects go to zero in a linear fashion, or is there some sort of a threshold below which we see no observable effects? I think most toxicologists would agree that there is a threshold.

We have a further nuance here, and that is a concept known as hormesis, which is getting a lot of attention in toxicological circles these days. It is that not only is there a threshold at very low levels, but in fact chemicals may behave dramatically different at low levels, and ndeed even have potentially a beneficial effect at trace levels, which of course goes on to be a detrimental effect as the dosage increases. Risk is basically a measure of toxicity and exposure. Every chemical has an inherent toxicity based on its molecular structure, and what we're interested in is the degree of exposure.

Of course, most of our concern these days is centred around the so-called synthetic chemicals. We hear of how we live in a chemically toxic soup, how we are surrounded by the 85,000 synthetic chemicals that permeate our life, which is, of course, true. That is roughly the number we are exposed to. It is also true that we do live in a chemical soup, but this chemical soup encompasses much more than the synthetic chemicals. It encompasses all of the substances in nature. If we had to have labels on an orange, for example, this is what it might look like, because there would be hundreds of different compounds naturally occurring in an orange.

There are about 20 million naturally occurring compounds that already have been investigated, and that is in contrast to the 85,000 synthetic ones that have been investigated. Indeed, the synthetic ones have been investigated far more thoroughly than the 20 million natural compounds.

● (1605)

If you were to look at this apple—or better yet, take a bite out of it—you might ask yourself what it is you are really sensing. You are really sensing this collage of chemicals, over 300 different compounds that have been isolated from an apple, things such as acetone, which you may recognize as nail polish remover, or furfural.

Furfural is a chemical that is known to be a carcinogen. When given to animals in a high dose, it triggers cancer, and that is the definition of a carcinogen. Not only is it found in apples, it is also found in grains and in sweet potatoes. And if you've had your cup of coffee today, you've ingested furfural along with benzene and styrene and other known carcinogens.

Obviously apples are not toxic. “An apple a day keeps the doctor away,” it has been said. Well, only if you throw it at him or her, actually, because there are no magical foods. But we don't worry about the furfural in an apple, because the dose really is so small.

We also, based upon our cooking process, expose ourselves to a large variety of potential carcinogens—benzopyrenes—in food that is cooked at a high temperature. These are known carcinogens.

Then, of course, we have all the environmental pollutants, the dioxin we hear so much about. Dioxin is spewed into our environment by various industries—not on purpose, but this so-called “most toxic man-made chemical” is a byproduct of industry. And indeed it is toxic; there is no question about it. But its toxicity depends on its structure.

Dioxin is not one compound. There are numerous compounds that fall into this category. When you have four chlorines on that molecule, it is extremely toxic, but when you only have two chlorines, it is far less toxic. So we have to pay attention to the structure of the molecule.

We also have to pay attention to the species we're investigating. The lethal dose of dioxin, based on milligrams per kilogram of body weight, depends on the species. It is indeed extremely lethal to guinea pigs, but far less lethal to hamsters. Where do humans come in? We don't know, because obviously it is not possible to do a controlled trial. It would not be ethical to do that.

We're also hearing this being described as the most potent carcinogen ever tested on animals. We don't contest that; that indeed is correct. If you take the case of a rat, you can provoke a liver tumour with a daily intake of 10 nanograms per kilogram of body weight. That's a very small number. We also know that at one nanogram there is no effect. But of course what we're really interested in is what the human exposure is, and the human exposure is about 0.002 nanograms, which is 1/500 of the no-effect dose in animals.

So numbers matter. In science we're always talking quantitatively as well as qualitatively. We also look at epidemiology, and we have a lot of this for dioxin, which was a contaminant in Agent Orange. In Operation Ranch Hand, air force personnel were exposed to fantastic amounts of Agent Orange. Numerous papers have been written on its effects, and researchers still debate whether or not there has been any consequence of dioxin to people who were essentially immersed in it.

We also had a terrible accident in 1976 in Seveso, Italy, when a herbicide manufacturer released a huge amount of dioxin. We've been following the consequences of that in the population of the area, and the only thing that has come to light is that there has been, interestingly enough, a disproportionate number of girls being born to men who were exposed.

This is something we have some indication is happening in North America as well; the area around Sarnia apparently has given rise to the same kind of problem. So there is a possible hormonal connection to dioxin, which is quite distinct from its carcinogenic potential.

Of course, what we're really interested in, and the reason I've been asked to come here, is what we do about the chemicals that are present in our blood, as Environmental Defence has found.

For example, polybrominated diphenyl ethers, which are flame retardants and certainly save lives because of that activity, are present. In the Environmental Defence study, one subject had 0.5 micrograms per litre in the blood. That is a large amount of polybrominated diphenyl ether, but let's put it into context. It means, because we have roughly 5 litres of blood, 2.5 micrograms in the body. The no-effect dose in rodents is about 2,500 micrograms. That's quite a bit larger.

● (1610)

So what do we really do with this number? Does it mean that it has an effect on humans? The fact is that we don't know, but we do have to keep in mind that all of these carcinogens fall into a relatively small percentage in terms of premature cancer risks. An unbalanced diet is responsible for about 35%, and all of the industrial products, depending on opinion, may be 1% to 5%, but they're in the bottom range. So where are we going to put our emphasis and where will we put our money to try to improve people's diets with a chance of reducing cancer rates very significantly?

Tobacco, infections, sexual behaviour, we can do a lot there. We can do a great deal on occupational exposure as well. So whether or not all the attention being paid to the 1% is warranted has to be regarded in light of everything else.

I'd like to leave you with a couple of points that I try to get across to our students, and to the public as well, when we talk about chemicals and potential toxicity.

There are no good or bad chemicals; there are only safe or dangerous ways to use chemicals, and in fact there are safe ways to use dangerous chemicals.

Effects depend on molecular structure. We have to be very specific. People talk about phthalates—let's ban phthalates—which are plasticizing agents used in shower curtains, for example, to make them soft and pliable. Well, they're also used in children's toys, but there are many different kinds of phthalates and they have a huge range of toxicities. It makes no sense to lump them all into the same category, the same way that it makes no sense to lump all the dioxins into one category. In all probability in toxicity there are thresholds below which there is no observable effect.

High-dose animal studies may not reflect human risk properly, because the dosage itself imparts negative effects on top of what the chemical is. I think it would be far better to take a look at what the maximum human exposure is, put in a safety factor perhaps of 100, and test that dose in animals, rather than test the maximum tolerated dose in animals.

Our bodies don't handle natural or synthetic chemicals differently. We have various protective mechanisms. We have enzyme systems that handle small doses of chemicals, and only when these are overburdened do we run into problems. Small doses are not necessarily a problem, and the presence of a chemical does not equate the presence of a risk. Indeed, if we do a proper analysis of our blood, we would find thousands of different chemicals, most of them coming from natural sources but some of those would have toxicities comparable to the synthetics.

Science can never prove that there's no risk associated with a chemical. We hear a great deal about the precautionary principle. We're asked, as scientists, to show that there is no possible risk before we unleash a chemical upon the unsuspecting public. This is a criterion that scientists can never meet. You can never prove that a negative effect is possible.

I could not prove to you that reindeer cannot fly. I suspect we would all agree that they cannot, but I couldn't prove it. I could take one reindeer up to the top of the Peace Tower and nudge it off, and if there ever was a moment that the reindeer would want to fly, that would be it. I don't think it would. We'd have a mess, but all I would have proven is that the reindeer or its confrères, on that given day, could not or did not wish to fly. You cannot prove a negative.

Risk cannot be eliminated. It has to be evaluated with respect to benefits. We talk about eliminating bisphenol A, for example, which is a potential estrogenic compound but is also used to fix our teeth. We hear a great deal that people who have poor dental care are more prone to heart disease. Well, bisphenol A is found in the composites that are used there. It is used by policemen, to shield them from bullets. It is used to make unbreakable bottles. We have to make decisions.

It is always a question of risk and benefit, and that's where judgments come in, but that's where toxicological knowledge also has to come in.

I leave you with one final thought, and that is that not taking any risk is also a risk, in and of itself. So I thank you for listening to me, and if there are any questions that come up after, obviously I would be very happy to try to answer those.

The Chair: Thank you, Mr. Schwarcz.

Are you both planning to speak? We took about 13 minutes there. We should to try to keep it to about 10 minutes so that our members have an opportunity to question you fully. Certainly you may share the time, however you plan to do it.

● (1615)

Dr. Gail Krantzberg (Professor and Director, Dofasco Centre for Engineering an Public Policy, McMaster University): Thank you, Mr. Chairman and committee members, for the opportunity to speak to you today.

I would like to begin my remarks with some of the impartial findings of the International Joint Commission, the IJC. Many of you know the IJC was created under the Boundary Waters Treaty and they hold the Great Lakes Water Quality Agreement as a standing reference.

The binational treaty organization is responsible for oversight of government progress in restoring and maintaining the integrity of the waters of the Great Lakes basin ecosystem. To address toxic threats, they articulated a new approach that the governments of Canada and the United States committed to when they signed the revised agreement.

The IJC's position is that given the inherent complexities and limitations of evaluating chemicals in isolation from each other, in addition to the scientific uncertainties proving causal relationships between specific chemicals and corresponding health effects, society should eliminate the production and release of chemicals that can not be safely regulated.

The IJC identified a class of chemicals, called "persistent toxic substances", that cannot be safely regulated. These chemicals include those that cause death, disease, behavioural abnormalities, cancer, genetic mutation, physiological or reproductive malfunctions, or physical deformities in an organism or its offspring. Please note that cancer is not the only end point that the commission was discussing; there are many other end points. It's also worth remembering that cancer is an end point that can take decades to emerge, and its etiology—its cause—can be even much longer to determine.

Article II, to which Canada committed with the United States, says in part that it is the policy of the parties that

> the discharge of toxic substances in toxic amounts be prohibited, and the discharge of any or all persistent toxic substances be virtually eliminated.

In fact, in this entire annex that Canada committed to signing when they signed the Great Lakes Water Quality Agreement—annex 12, on persistent toxic substances—the general principle, the intent, of the program specific to this annex is to virtually eliminate the inputs of persistent toxic substances in order to protect human health and the continued health and productivity of aquatic living resources.

The list of chemicals also includes those that bioaccumulate—that become more concentrated as they work up the food chain—and chemicals that are persistent. "Persistent" is defined as a half-life greater than eight weeks in water, soil, or living things. If a chemical falls within these classifications, the IJC says it should be eliminated. The approach does not require exhaustive causal proof of harm; rather, decisions are based on a weight of evidence. When there is reasonable documentation that certain chemicals are linked to certain effects, this evidence is sufficient to trigger preventative measures to eliminate the toxic sources. For example, since many chlorinated chemicals studied to date exhibit one or many of these characteristics, the IJC recommended, in its 1992 biennial report, that these chemicals be eliminated from the Great Lakes ecosystem.

Let's turn to government, then. Governments typically regulate chemical releases in order to reduce the occupational, environmental, and public health threats of toxic chemicals. They do this assuming that there are acceptable levels of emissions. End-of-pipe control technology is now at odds with the more sustainable green chemistry that invests in innovative, clean production technologies that eliminate the use of toxic or unnecessary chemicals in the first place.

Further, typical government standard-setting and regulatory approaches to date have been based on risk assessment that evaluates chemicals in isolation from each other to determine the relative risk they pose to environment and health. This approach has allowed the continued production and use of thousands of chemicals, despite their potentially destructive impacts. We've heard approximately 70,000 to 85,000 different chemicals are now in commercial use; most have not been screened to learn whether they cause cancer or have any other effects on the nervous system, immune system, endocrine system, or reproductive system.

Based on quantitative structure activity relationships, which is the relationship between the structure of a chemical and its pharmacological action, one could predict that one chemical will act like another class of chemicals if they look similar in structure. For example, one would predict that the polybrominated diphenyl ethers would have properties very similar to those of PCBs. In fact, they're both highly stable at high temperatures. We understand the toxicity threats posed by PCBs and take measures to stop PCB production, so when the use of QSAR principles shows the likelihood they will behave like PCBs is high, why would we have to prove PBDE toxicity?

● (1620)

In my submission, which is more detailed, I actually present to you the structures of PCBs and PBDEs, and you'll see that they look very much alike.

So what's the European Union doing? Let's look elsewhere for some guidance.

The proposal on the new EU regulatory framework for the registration, evaluation, and authorization of chemicals, REACH, which some of you have heard of, was adopted in 2003. And I'll quote:

> REACH aims to improve the protection of human health and the environment while maintaining the competitiveness and enhancing the innovative capability of the EU chemicals industry. A preventive and precautionary approach seeks to shift the burden of proof onto the chemical manufacturers to prove that a chemical is not hazardous to human health or the environment before it is introduced to commercial use, rather than wait for massive injury before any protective action is taken.

I want to come down to some terminology.

There's a lot of research and debate about the ability of certain chemical compounds to cause endocrine disruption at critical stages of fetal and childhood development. This kind of disruption fundamentally challenges the current policy assumptions that there is a safe threshold for exposure to toxic chemicals. It also challenges the regulatory paradigm of the last quarter of a century, which has evaluated chemicals on their ability to cause cancer. I frankly think we've learned a bit more since the sixteenth century about chemicals—the dose causes the disease.

Here's the precautionary principle, as defined right within CEPA, an internationally recognized principle for action that states:

> where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation;

Let's contrast this with sound science. Wikipedia offers the following definition of “sound science”, and I quote:

> Sound science is a phrase often used by corporate business and industry public relations and by government agencies to describe the scientific research that is used to justify their political claims or positions, or to vilify research threatening their interests hence safeguarding their revenue. Sound science, however, has no specific scientific definition itself, so the phrase is used subjectively.

Wikipedia offers the following definition of “junk science”, which I rather like: “Junk science is a term used to derogate purportedly scientific data, research, analyses or claims which are driven by political, financial or other questionable motives.”

And then there's the really interesting phrase “scientific certainty”. I'm a scientist and I've never, ever encountered scientific certainty. So scientists could define “scientific certainty” as “being 95% sure that cause and effect have been correctly identified.” It is exceedingly rare for a large group of scientists to be 95% certain about anything, especially about anything as complex as environmental problems. When you're talking about living systems, great scientific uncertainty is the norm.

How is scientific uncertainty currently treated in environmental protection? Well, let's look at the classic case.

The classic case is the introduction of tetraethyl lead into gasoline. When chemical and automobile corporations announced that they were starting to put highly toxic tetraethyl lead into gas in 1922, numerous public health officials thought it was a bad idea and they urged delay and careful studies. The corporations argued that there was no scientific agreement about the threat, and in the absence of convincing evidence of widespread harm, which was impossible because they hadn't even taken the action yet, they insisted that they had the right to proceed. The consequences of that decision are now a matter of record: tens of millions of Canadians and Americans suffered brain damage, their IQs permanently diminished by exposure to lead dust.

Finally, I'd like to conclude with the Canada-Ontario agreement and come back to the Great Lakes Water Quality Agreement. The Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem, COA, is a federal-provincial agreement aimed at enhancing and protecting Great Lakes basin ecosystems. The agreement outlines how the two governments will cooperate and coordinate their efforts. The most recent COA was signed in 2002. It expires in 2007. The agreement fundamentally has been helping Canada meet some of its commitments under the Great Lakes Water Quality Agreement.

● (1625)

The COA has an annex called harmful pollutants. Under the goals of the harmful pollutants annex are to virtually eliminate or reduce harmful pollutants in the Great Lakes. Of the ten expected results under the annex, six are focused on reductions of prioritized chemicals.

Let me note some of the principles in the 2002 COA—and these are included in more detail in my submission—I'll just name a few: adaptive management, openness, continuous learning, progress, improvement, pollution reduction, the precautionary principle, prevention, stakeholder engagement, and sustainability.

As we examine and currently witness the government's review of the Great Lakes Water Quality Agreement that's under way right now, it will become increasingly important to examine the current science policy and the emerging concepts in ecosystem protection and the protection of human health. The CEPA review is highly relevant to this review. It could set Canada's tone for addressing chemical insults for which the Great Lakes Water Quality Agreement contains many federal commitments.

Finally, most risk assessment and risk management methodologies consider that the greater the persistence of the chemical, the greater the potential risk to the ecosystem. I'd like for CEPA to consider that some pollutants arise from substances that are in use on a continual basis, high-production chemicals, chemicals that are in personal care products, pharmaceuticals that have value to society but are constantly introduced into the environment, and of which, for all intents and purposes, the supply is continuously replenished. Therefore, even substances that don't have long half-lives in the environment should be subject to scrutiny through CEPA.

To conclude, I recommend the precautionary principle of CEPA be not only upheld but applied vigorously to protect the most sensitive use; that debates that centre around sound science be excused as immaterial; and that scientific certainty is recognized to be a myth—as no such thing exists. I'm not arguing that toxic substances can derive from natural or man-made sources, there are toxic substances that are in use that the precautionary principle of CEPA needs to look at extremely carefully.

Thank you.

The Chair: Thank you.

Mr. Weinberg, I would ask you as much as possible to address Mr. Schwarcz's comments. Rick Smith did give us some very definite studies that had been done on the families he looked at, and then Mr. Schwarcz did an interview where he questioned some of those findings. The intent of the committee was to look at both sides of the issue to try to balance that off, to really understand the studies better. The more you can address that, the better it would be for us, if you can, please.

Mr. Jack Weinberg (Senior Policy Advisor, International POPs Elimination Network): Thank you. I'm honoured to be invited to testify before this committee.

My name is Jack Weinberg. I'm a senior policy adviser to the International POPs Elimination Network, which is a network of non-governmental organizations in 70 countries. It started around the negotiation of the Stockholm Convention and now works more generally on chemical policy.

I got a call from colleagues on Monday—I live in Chicago—to come in on this, so I will try to shed as much light as I can. Although I've not been following your debates, I did prepare some notes.

Without talking about the study per se, although we can go into what I can share on it, my heart sank when I heard Dr. Schwarcz's comments, since I thought we had gone beyond some of those debates some time back. Let me give some examples, and then maybe I can go into more detail on how they might relate.

First of all, while the precautionary principle is embraced in most of the world, there is nowhere that it's embraced as a no-risk policy. The precautionary principle balances three important components. The first is that there is substantial reason to believe there's a cause-and-effect relationship—not necessarily definite proof, because that's almost impossible, but some substantial reason. The second is that the potential for harm is large-scale and irreversible. The third is a socio-economic consideration: what are the relative social implications and cost implications, and are alternatives available, and so forth.

A policy that's based on the precautionary principle, which CEPA has been and which it needs to continue to be, is a policy that balances in a proper way those three considerations and doesn't get stampeded by efforts to create scientific doubt and the whole manufacture of scientific uncertainty, which was begun with the public relations organizations supporting the tobacco industry, where the term “sound science” was first initiated.

The whole manufacture of doubt has become a large-scale industry. We've seen it with climate change. The cause and effect relationships in toxicology are much more complicated and the issues are much more individual, and therefore the manufacture of doubt is a much more lucrative industry and much easier to pursue.

I want to give an example of the kinds of things we heard that sound good on the surface but then fall apart. We talked about PBDEs. The study said there were 0.5 micrograms per litre in the blood, and since there are five litres of blood in a human body, we're talking about 2.5 micrograms in the human body. Well, that would make sense if blood were the main place where these pollutants are stored. But we know these pollutants are lipophilic; they're primarily stored in the fat. They only appear in the blood because there is some fat in the blood. So the kind of “sound science” that takes the only thing we know, which is what was found in somebody's blood, and therefore generalizes to a full-body burden of 2.5 micrograms in the body, is not sound science at all. It is public relations.

Let me give another example. We were told—and it's correct—that there are many forms of dioxin. The four-chlorine—the tetras, with a chlorine on the four corners—are the most toxic. That's well known. It's also well known that the octas, which are the common dioxin form—not the bichlorine, but the octas—are the really not highly.... But we've all known that for many years, and no place in the world that I know of regulates dioxin by individual congeners.

Scientists and policy people have come up with a notion of “toxic equivalency factors”, taking the tetras as one and then assigning all the other congeners a fraction; then, whenever you analyze for dioxin you come up with a toxic equivalency, the TEQ. All regulation on dioxin is based on TEQ, because there's recognition.

So again that was throwing smoke. That was not based on any real debate that's going on.

● (1630)

Also, as to this stuff about the apples and oranges, CEPA, I presume, like other chemical policy legislation, addresses anthropogenic toxic substances. It doesn't represent all chemicals; we're all made of chemicals. It's anthropogenic.

By anthropogenic, it's either things that are synthetic, things that are man-made, or since a lot of things that are man-made also exist in nature and because there are other ways of getting toxic materials into nature other than their manufacture, there are also toxic substances that are mobilized in nature, in the environment, by human activity in unnatural quantities. So it's anthropogenic toxic substances that we are talking about, not all chemicals.

The reason this is an important matter is that we started out, as you recall, when there was a hole in the ozone layer, and there was the question of the science, tying ozone-depleting substances to the stratospheric ozone depletion. That was debated for a while. It was opposed and the science was debated, but it was finally resolved.

Then we went through a much more bitter debate about greenhouse gases in the atmosphere. Again, the actual basic mechanism is extremely simple, so the manufacture of doubt was on all the actual climate science and the mechanisms and sinks, and all that sort of thing. So we lost a good decade, and maybe we'll lose more, in dealing with an extremely difficult problem that, once we recognize it, we'll find that the things we have in place are not sufficient to deal with it. It's a very serious problem to the world.

But the question before us today, anthropogenic toxic substances, is much more complicated. The stratosphere is a rather simple mechanism. For the atmosphere, the mechanism was simple but the climate models were difficult. Now we're talking about the biosphere—that is, humans and all living things evolved in a particular chemical environment, and everything about us is chemical.

Biochemistry is the miracle under which the fetus develops. We develop into full human beings. All our bodily functions are managed by a biochemical process.

We are now introducing a large number of anthropogenic toxic substances into this biosphere, and some of the impacts are known, and some are less known, but we cannot accept any longer....

We thought this was resolved with science that originated in the Great Lakes of U.S. and Canada in the 1980s and early 1990s. LD 500, where you see how much it takes to kill a fish, is not the be-all and end-all of toxicology. That's one aspect. That's for acute poison; that's what kills.

What we learn is in regard to what has been called endocrine disruption, but I think sometimes that gets confusing. So even though this is not the normal word, I prefer to call it signal disruption, because that's a more general term.

Most biological processes are managed through receptors on cells. Chemicals, then, are attached to that receptor, and they trigger some kind of activity. That's how development occurs. That's how bodies function. So that's receptors. It's very complicated. So you have a chemical information exchange system that goes on in the human body. It's also through smelling. Some animals exchange information that's necessary through hormones, but you have very complicated chemical information exchange systems.

Signal disruption comes when chemicals that are synthetic or anthropogenic, either in their existence or in their quantities in the environment, which are different from the conditions under which these organisms evolved, are suddenly in the environment in quantities that are putting noise into a very complicated signaling system. That noise can take the form of a chemical that attaches to a receptor and triggers an action that's not supposed to be triggered. It can take the form of a chemical that attaches to a receptor and prevents it from reacting when it should react. Or in other ways it can interfere with the chemical before it reaches the reactor.

So a large number of health effects that began to be understood only in the 1980s and early 1990s, largely initiated by research in the Great Lakes, are mediated by these signal disruption mechanisms. Endocrine disruption is the mostly commonly discussed, but it's broad, and the dose equals the poison.

● (1635)

While it might have been adequate for the 16th century, science no longer addresses this. I think most scientists believe that for dioxin in the vicinity of zero, the dose response curve is linear to zero. I think that's been disproved, although there are many efforts to fudge it.

I think the dioxin dose response curve in the vicinity of zero.... But in large quantities of dioxin, as we saw, the prime minister to be of the Ukraine was poisoned with a large quantity of pure dioxin, and he didn't die. A lot of the signal-disrupting chemicals have very strange dose response curves. Some scientists have even been finding U-shaped dose response curves. Where it's close to zero, it's going up quite rapidly. Then not only does it taper off, but in larger doses it starts going down. This is because biological systems will respond to small doses as a signal of some kind, but when the dose gets large, that whole system shuts down, so as not to overreact the system.

We're not dealing with LD500s, and we're not dealing with how much will kill you and not much under that. We're dealing with a large number of effects that affect intelligence, learning ability, behaviour disorders, and a developing fetus. We're dealing with reproductive effects, such as the one that was mentioned from Servaso, and many other reproductive effects. We're dealing with immunological system dysfunctions that we still don't fully understand. Very likely, we're dealing with the prevalence of prostate cancer and other prostate problems in males of my age, caused by events that occurred when I was a fetus. It took all that time to develop.

These things were all discussed when I was following Great Lakes environmental issues ten years ago, and more. These are the problems that we have to address.

More was said in that presentation and in question and answer, but I'm sorry to say I'm not a trained toxicologist. I'm just a well-read layperson. I do admit to being an advocate.

I think those are very important questions, and I want to say a little, if I can conclude, about this committee.

● (1640)

The Chair: Mr. Weinberg, our members have full opportunity to ask questions.

Mr. Jack Weinberg: I wanted to say something about CEPA, but maybe you've been talking about CEPA enough and want to discuss this issue. Maybe we can come back to some thoughts on CEPA in the question and answer.

Thank you.

The Chair: As our members ask questions, I encourage our witnesses to interact. When you hear something you want to respond to, please do so.

Mr. Godfrey.

Hon. John Godfrey: That's exactly what I'd like to happen. I'd like to turn my ten minutes over to an interchange between Mr. Weinberg and Dr. Schwarcz.

It seems to me you have more things to say, but I think Dr. Schwarcz would like a comeback.

Go to it, gentlemen. You have ten minutes.

Dr. Joe Schwarcz: I don't think we're at odds in terms of trying to protect the public. I mean, this is motherhood and apple pie. Of course we want to eliminate dangerous substances from our environment. The question is how we go about doing this. We can both spew data, but it comes down to a question of judgment and making educated guesses.

I would dispute the dioxin curve. I think there certainly is evidence for dioxin having a hormesitic effect. I would direct you to a number of papers by Ed Calabrese, who has looked at this issue extensively with his colleagues. There's a lot of information on this, that it's not a linear curve.

The reason I looked at the blood chemistry when we were talking about the ethers is that this is exactly what Environmental Defence did. They took subjects from across the country and measured blood levels. They did not relate it to fatty deposits and how much was in the fat. They looked exclusively.

Incidentally, the polybrominated diphenyl ethers have been extensively looked at both in terms of total body burden and in terms of what is present in the blood. I've searched the literature on this really thoroughly, and I don't find any animal data that would suggest the doses we are exposed to represent a risk.

I keep coming back to the fact that, as you well pointed out, there is no certainty in science. We make decisions. We have come to be accustomed to a certain mode of living wherein we make use of a large variety of substances. The number of chemicals to which we are exposed is immense. If you just think back to what you may have done in the last 24 hours, you've probably drunk out of plastic cups, eaten out of plastic dishes, or used cosmetics.

These are chemically extremely complex things. Each of these has to be manufactured. It's impossible to manufacture them without releasing some substances. Just the fact that substances are there and are measurable really doesn't say anything more than that we have tremendous analytical capabilities, in that we can now measure things down to parts per trillion or even less.

And just one more thing: you were talking about changes in molecular structure and how subtle that concept is. That, of course, is true. But you can't always predict. If you look at methanol and ethanol, what could be more similar than those? You're looking at the two fundamental alcohols, with one carbon difference, and yet methanol is far more toxic than ethanol. I think if you didn't know that and only looked at the toxicity of ethanol, you would not predict the methanol toxicity, or vice versa.

Hon. John Godfrey: I didn't mean to exclude, by the way, Dr. Krantzberg from this or—

● (1645)

Dr. Gail Krantzberg: I'd like to make one point, if I can.

The Chair: I think Mr. Weinberg was next. Then, Ms. Krantzberg, we will come to you right after.

Please try to keep it—and I think you'd agree, Mr. Godfrey—as brief as you can so that we get the maximum.

Mr. Jack Weinberg: I really hope that the debate over chemicals can become a good-faith debate and not a spin debate. To find one-sided sets of arguments from all kinds of places always tracing back to the same sources is discouraging.

Yes, they looked at blood, because you can't take a human body and cook out all the fat. Blood is the best. You can take a fat incision; you can do all kinds of medical procedures. That's why they looked at blood, but we know these are fat-loving content and we know the body burden exists in fat. I consider that to be just the manufacture of confusion to people who don't know this.

On the question of the dose response on dioxin, I remember that in the early 1990s there was a big conference. The industry then put out big press releases saying that this conference concluded the dose response was near zero, that it was not toxic; then, in *Scientific American*, all the scientific associations said those were not the conclusions, that was just a public relations spin on the conclusions.

Originally the U.S. EPA was going to reassess its dioxin based on those findings. Now it's been 15 years, and because they couldn't make that case, they haven't ever concluded that reassessment and have reached no conclusions, because either you'll reach the right conclusion or there's enough money and enough influence to keep you from reaching any conclusion.

Hormesis, though, is different. There's a dioxin curve. I only said "linear" in the vicinity of zero. The dioxin curve is not linear. In very small quantities it has profound impacts, but as those quantities go up—that's what Seveso and other things say, and this poisoning in Ukraine—when populations, whether people or animals, are exposed to small amounts, it disrupts a lot of the basic biochemistry, and particularly affects development.

We have studies on PCBs in the Great Lakes of children whose mothers ate Great Lakes fish. These are old studies now. Their children had substantial learning deficits relative to mothers who didn't eat Great Lakes fish. We knew this a long time ago, but the scientists who found that in studies eventually were intimidated, and all kinds of other things happened.

I think the discussion should be a discussion in good faith, in that we are really trying to not just look for all of the partial scientific factoids that support one particular case.

Chemical regulation is a complicated matter. I think it's very fortunate that CEPA is reviewed every five years; that allows a possibility of updating maybe every eight or nine or ten years. New things are found out. I think that CEPA is finally—and in your last review—starting to take up these chemicals for which there are very little data. I forget the name of the list, but you have a list of 23,000 chemicals that were originally grandfathered in, and you've now characterized them. I think that's a very important step. The question now is what's going to come next.

We think the European Union is moving in a good direction. They're actually starting to require the development of data on all these chemicals in more detail. Then they can move into regulatory decisions on them. If I understand, I believe your inherent toxicity criteria are still based on how many fish will die—the lethal dose 50—and do not take into account many of the other toxicological approaches.

Chemicals policy in a world where the environment of life is full of anthropogenic substances that are different from the chemical composition of life when things evolved is a very important responsibility on all of you. I believe that you need very sensitive legislation that goes for increased data and applies the precautionary principle—that is, a no-risk principle—but that also includes another principle that's different from the precautionary principle and that is also discussed and included in law in some places, a principle called the substitution principle. That is, if you have a substance, and it has hazardous properties that are well known but there are alternatives that do not have those hazardous properties or have less hazardous properties, if the economics and the utility are sufficiently compelling, there is sufficient reason to require substitution. You don't need to ban a chemical.

● (1650)

The final thing is, it's not the case that all chemicals can be safely managed. There are some chemicals that, if you produce them and they use them, end in the environment, particularly if they go into products, and so forth.

I very much hope you take a very close look at CEPA and continue to update it as the global debate on chemicals policy moves forward.

The Chair: Ms. Krantzberg.

Dr. Gail Krantzberg: Thank you.

To keep the dialogue open and balanced, I want to draw attention to statements such as that there's no evidence that PBDEs at current levels are a risk. That's a true statement, but we also know that PBDEs are increasing in the environment and in animal tissues on a logarithmic scale.

The question we might want to ask is what the projected future is, and maybe we ought to take action before we're at a point where we're approaching concentrations that cause risk, because we know certain of these substances are toxic to invertebrates. Why are we waiting?

That's one point. Another point is that very often the effects we see with certain substances and that *Toxic Nation* was describing are subclinical. We're talking about loss of several IQ points in children who are exposed to mercury in utero. We know about this, and we think, "What's a few IQ points?" But in fact if you talk to people in the field, what you end up doing is moving the population's bell curve sufficiently that you have a fairly substantial increase in the number of people who are handicapped and a substantial reduction in people who are gifted. So there's a societal cost for some effects that are still subclinical.

I think the most important point of *Toxic Nation* is not to claim that the concentrations they're observing in the blood of these people across Canada are causing damage now. I think it's a call for biomonitoring, for the evaluation of the potential effects of these substances on humans and on other members of the ecosystem. It's not just humans: we are responsible for protecting—we're stewards for—everything else without voices.

It's a call for action. We're finding it in our systems. As Mr. Weinberg was saying, we didn't evolve with those in our environment. We're not accustomed to many of those chemicals being in our system. So what effect might they be having in our systems? It's a call for caution, and it's a call for research; it's a call for biomonitoring. And it's not a call for *Toxic Nation* to do the biomonitoring; it's a call on governments to understand what the possible outcomes or consequences of these substances being present in people across nations are. What's the consequence?

The Chair: Mr. Schwarcz.

Dr. Joe Schwarcz: There's always a “but” in science. No matter what you look at, there always will be a “but”.

Science doesn't progress by giant leaps. It progresses by a series of very small steps. Of course, we're always trying to correct past errors. We hope that if we substitute a substance, it will be safer than the one before it. Obviously that's what the intent is, but it's not always easy to know that. You can't predict. And truly one of the main points I try to make is that one should never suggest that they have knowledge that actually doesn't exist. There's just way too much that we don't know about what the consequences are of regulating and substituting.

I'll give you an analogy, perhaps. Right now we're talking about PFOAs. It's been in the paper for the last couple of days because of the ban on certain perfluorinated compounds, especially the telomers that are used as stain removers. I think that this is a good thing. I think that we do have accumulating evidence of problems there, but there are going to be consequences. We use these products in order to resist stain. If that's not going to work, people will have more stains. They will go to the dry cleaner more often. Then we worry about the tricholoethylene that is used by dry cleaners. That's a very legitimate worry. Tricholoethylene is one of these persistent chemicals that I think we need to do something about.

Then we talk about replacing that maybe with liquid carbon dioxide. The manufacturing of liquid carbon dioxide is not a totally benign procedure either. There are other ways to make stain-resistant compounds. There are some very new technologies, including carbon nanotubes that you've probably heard about. This is all based on the buckyball technology, which is really quite fascinating, because it's essentially a discovery of a new form of carbon. Everyone knows about graphite and diamond as a form of carbon. Well, we have another form—these so-called buckyballs, after Buckminster Fuller, who was the architect who designed geodesic domes. These substances can be incorporated into fabrics in order to ward off stains.

We've already seen a demonstration in Chicago in which the demonstrators dropped their pants that they had purchased at Eddie Bauer, because Eddie Bauer was, according to them, using Teflon to keep off the stains. They weren't even using Teflon. What they were using was the buckyball technology, so they even got that part of it wrong. But in the next demonstration they had, they at least corrected that and they were demonstrating against the use of these nanoparticles in stain-resistant materials. Why? Because the suggestion is that we don't know what is going to happen if we expose the public to these nanotubes. The public, of course, has been sensitized to this because they read Michael Crichton's book, *Prey*, which suggests that these nanoparticles can somehow multiply or self-assemble and turn the world into toxic goo, as he calls it.

So there is always a “but”. Yes, we try to replace things with the new, and it doesn't always work better. We have to make some educated guesses on these things. We have to look at each class of chemicals very specifically. We have to look at the molecular structures. We have to look at the amounts. I think that there are thresholds, but obviously not everyone agrees with that.

● (1655)

The Chair: We've obviously gone over our time for this question. We're rewarding Mr. Godfrey for a good approach to asking the question.

Also, I would suggest, Mr. Glover and Ms. Taylor, if you have comments at the end, after we have heard this cross-examination, if you would like, we'll give you the opportunity to make comments.

Mr. Paul Glover (Director General, Safe Environments Programme, Department of Health): We would very much welcome that opportunity.

The Chair: We've had the clerk's office here doing some research and we do have some precedents that we will mention later, but I think in the rules of the House the overturning of a ruling is not necessarily considered a matter of confidence in the chair. That probably summarizes that fairly clearly for members. We'll see that everybody gets a copy of that along with a number of examples of where that's happened.

Mr. Lussier.

[*Translation*]

Mr. Marcel Lussier (Brossard—La Prairie, BQ): Mr. Chair, I am no doubt tempted, like Mr. Godfrey, to let the witnesses have my full 10 minutes and even to also invite Mr. Glover and Ms. Taylor to take part in the discussion.

I was also tempted, after reading Mr. Schwarcz's biography, to ask him to talk to us about the chemistry of love. His biography says that he is a specialist in the science of aging.

I think that we could let the three partners speak or exchange ideas, but, first, I want to ask Ms. Krantzberg a question.

When you work in consultation with the United States, pursuant to the Boundary Waters Treaty signed in 1909 between Canada and the United States, how do you agree on the list of dangerous chemicals included in the Great Lakes sampling programs? Is this list established in consultation with Environment Canada and the Environmental Protection Agency? Does this list also apply to the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem?

[*English*]

Dr. Gail Krantzberg: Just as a small correction, I'm now a professor at McMaster University. I've just moved away from the IJC. But I can talk to you about the IJC and the list of chemicals.

The Boundary Waters Treaty of 1909 stated that no activity on one side of the border will cause injury to health or property on the other side of the border. It set the stage for the Great Lakes Water Quality Agreement, which the IJC recommended happen and which the two governments, of Canada and of the United States, through the Department of Foreign Affairs and the Department of State, agreed to.

There is an annex, called Annex 1, that has all of the specific chemical objectives for organics, persistent toxic substances, nutrients, microbiology radiation, and so on. That list was first compiled with advice from the Science Advisory Board, which is a binational board that reports to the IJC, composed of scientists from academia, industry, and to some extent government on both sides of the border, equally populated by Canadians and Americans. Their recommendations went up to the IJC, and the IJC recommended to governments that they implement this list.

The list is now, in some cases, 34 years out of date. A lot of the discussion in development of those lists was based on the inputs of EPA and Environment Canada scientists.

The Canada-Ontario Agreement adopted the top 12 substances the IJC identified as the “dirty dozen”, the ones for virtual elimination. They included those substances in the Canada-Ontario Agreement to work towards their elimination in the environment.

That agreement was in 2002. It's also related to the commitments Canada has made with the United States on something called the Great Lakes Binational Toxics Strategy, which is also a strategy to use voluntary practices to move towards the elimination of those same 12 substances.

So it's a very popular 12-substance list. It doesn't include many of the compounds Dr. Schwarcz was just talking about and we've been talking about; those weren't known at the time. There are many substances that are on the DSL list right now that don't appear on any of these lists.

● (1700)

[*Translation*]

Mr. Marcel Lussier: Will new products be added to this list?

[*English*]

Dr. Gail Krantzberg: The agreement is being reviewed right now, and an approach to specific objectives in this annex is being discussed. A lot of interest is focused, instead of on creating a list with numbers that will be out of date as science advances, on trying to build upon, for example, a process like CEPA, so that the governments will be able to explore these new substances through a regularly reviewed process binationally, and on trying to coordinate the binational review of these substances between the EPA and Environment Canada using a mechanism like CEPA.

[*Translation*]

Mr. Marcel Lussier: Once again I am addressing my comments to Dr. Schwarcz.

Sir, your comments are extremely interesting, particularly when you talk about the connection and interaction among all these cancer-causing products.

Let's talk about products that attack the ozone layer, which leads to cancer. Given how these products interact, what should we be doing in order to try to find a solution to this international problem?

[*English*]

Dr. Joe Schwarcz: Thank you.

Let me just address the first comment you made because of an interesting statement the interpreter made. You asked...when looking at my biography and the things that I do, because I give a lecture on the chemistry of love, and the interpreter said, “I thought I heard 'love', but it couldn't be that.” Well, it could, because I do do that.

The idea is that the world, of course, functions on chemicals, both natural and synthetic, and I try to emphasize that and explain it, including the fact that there are certain substances that are responsible for our falling in love. One that has been looked at is a chemical called phenylethylamine, which has been found in chocolates.

The press has made a big deal about that—chocolates being the classic gift of lovers on Valentine's Day—because you're saying, here, have some phenylethylamine and fall in love, hopefully, with the donor. It's a charming story but it's really chemical nonsense, because the phenylethylamine never goes through the blood-brain barrier, never goes to the brain. As we know, chocolates go directly to the hips without getting into the brain.

Those kinds of chemical subtleties are important, which addresses your next question about the mixture of chemicals. I don't have any answer to that and I don't think anyone has any answer to that because it's such an unbelievably complex mixture.

We can't possibly measure all the interactions. There certainly are some interactions that we know. We know, for example, that if you have iron and vitamin C together in your diet, the vitamin C enhances the absorption of iron. I mean, these kinds of things have been done. We know, for example, that if you take certain medications, you can't take them with grapefruit juice because it changes the blood chemistry, changes the level.

But these are unique interactions that have been measured. It just isn't possible to globally measure every possible interaction. What we do is we take a look at total exposure, doses, and the underlying chemistry, and based upon the knowledge that we have accumulated, we try to come to some sort of decision. It cannot be certain.

You also asked the question about the ozone layer. Just to give you a little bit of a history to that, the reason that the chlorofluorocarbons were introduced in the 1930s was because in those days refrigeration systems worked on ammonia or hydrogen sulphide. These are terribly toxic substances—terribly. There were all kinds of ammonia leaks. You may remember just a couple of years ago there was still some old ammonia system used in a hockey rink somewhere in Alberta and the ammonia leaked out and a number of people were very severely hurt.

There was a need to find a new chemical to replace the ammonia. The chlorofluorocarbons were great because they were chemically very unreactive. You could put them into a refrigerator and compress them, and when they expanded, they sucked the heat out of the fridge. Everyone thought that this was great.

Nobody at that time could ever have imagined that these chemicals could eventually have an impact on the ozone layer in the stratosphere. And how could they? Why would anyone have ever thought of that? There wasn't any knowledge about ozone destruction. It just wouldn't have come up. You had a problem that you wanted to solve, which was the problem of refrigeration. It was a tremendous breakthrough. It saved thousands of lives by introducing the freons instead of ammonia.

Then eventually we found that there was a problem with the ozone layer. Now we address that problem because we find that not all freons fall into the same category. It depends on exactly how many chlorines, how many fluorines we have in the molecule, and exactly how they are arranged.

Well, now we have freons that don't have an impact on the ozone layer. Will they have an impact on something else that we find out 30 years from now? Nobody really knows, but we have a pretty good base on which to make judgments, because since the 1930s we've accumulated a lot of toxicological information and I would say that the chance is that the freons we're introducing now have a minimal chance of having any type of untoward effect. But it always comes down to making the decision.

I'm not a proponent for industry. I don't care if industry does well or not. I'm an academic—all I'm interested in is the scientific method and good science—but I don't think that industry is bent on unleashing dangerous substances into the environment, because in the end it doesn't do them good either. What does them good is producing good products that the public will appreciate and benefit from with minimal hazard. But you can't always predict that a hazard will be minimal.

● (1705)

It comes down to making decisions, but the decisions should be made by people who have expertise in chemistry, toxicology, and physiology.

The Chair: Okay.

Mr. Warawa, go ahead, please.

Mr. Mark Warawa: Thank you, Mr. Chair. I found this very interesting.

I am going to be keeping my comments short to give opportunity for further dialogue between the witnesses.

The focus of today's dialogue is measuring success. At the beginning we put together a number of ideas, the topics that we'd like, and a list of witnesses to speak with. Today's measuring of success dealt with three specific issues: the goals of CEPA and how they can be measured, how Canadians can be best informed about the state of the environment, and how monitoring of exposure to toxic substances can be improved.

I do have a question. As you're making your presentation, if you could be dealing with it, I'd find it quite helpful.

There were two issues, private members' bills that were dealing with phthallates and PFOS. I think it was you, Mr. Schwarcz, who made a comment about phthalates.

Is CEPA working? This is the review. We want to make sure that we have an effective environmental act that works. We've heard from other witnesses of frustration regarding the length of time it takes to deal with substances and assess them.

We also heard in the House recently that assessments that were done, for example, on phthalates were completed in 2000 and are therefore six years out of date. Are assessments made in 2000 still relevant, or do they need to be redone?

Doctor, you commented on that. As science progresses, do we need to redo some of these assessments? There are concerns about the PFOS and phthalates. Could you comment on that, where we go, and how we make CEPA effective, better? I'd appreciate hearing from each of you.

● (1710)

Dr. Joe Schwarcz: I'm not an expert on CEPA or the speed at which Parliament moves, although I gather it moves pretty slowly, whether it's on a CEPA issue or something else. From what I've read about CEPA, I think it is working as well as any such thing can work.

Yes, science progresses and things get out of date; what may be true today may not be true tomorrow. I encounter this regularly because I do a lot of public talks and I teach a lot of courses; the issue of today, yesterday, and tomorrow comes up all the time. I'll give you one example.

I had a former student at one of my public lectures ask me a question. I was talking about antioxidants and dietary supplements. She said, “You know, I remember having you as a prof at McGill 25 years ago”, which already is a bit unnerving. She said to me, “You know, at that time you were saying that there's really no need to take any kind of vitamin pill, but now you're suggesting that maybe a one-a-day vitamin is good. You see, you scientists—one day you say this, and the next day you say that. How can we trust you?”

Well, I would suggest that 25 years is not exactly one day this, next day that, and if I were saying the same thing today that I said 25 years ago, then I'd be really worried, because it would mean science hasn't progressed.

Certainly the story on phthalates has progressed dramatically. The original phthalate problem came up with something called diethylhexyl phthalate. That turned out to have environmental estrogenic consequences and various toxicity issues. Then they started to look at different molecules, because these phthalates were found in baby toys; that was a real concern because babies put their toys into their mouths.

It then turned out that when you rearranged the molecules somewhat so that you got something we call diisononyl phthalate, this doesn't have the estrogenic effects the same way.

Diisononyl phthalate was not used commonly until three or four years ago, so when you're talking about 2000, that probably was not part of the equation. Yes, I think the regulations tend to have a lag time there, but I don't know if there's any answer to that, because science keeps progressing. Maybe tomorrow we'll find another phthalate that is better, or maybe we'll find there's some problem with the diisononyl phthalate.

I think, especially as far as the public is concerned, it's very tough to get these issues across. I had a lady who called me up; she was really worried about her shower curtain. Why? It was because she had read the label on it, and the label said PVC, polyvinyl chloride. She had read somewhere that polyvinyl chloride is plasticized with phthalates, which is true; this is what makes it soft and pliable.

We used to have records—remember records? We used to put them on this machine; it turned around, and then you put an arm on it and music would play. Anyway, those black things were made of PVC, but they were very hard. The shower curtain is very soft because we add a plasticizer to it.

She was worried because she had heard about plasticizers and the phthalates. I don't know if she thought these were going to jump out of the shower curtain and attack, but she had toxicity concerns. I tried to explain to her that this was not a big issue, but she was going to change to a nylon shower curtain, not recognizing that there's an environmental concern there as well, because nylon production actually releases nitrous oxide into the environment, and nitrous oxide is a pretty potent greenhouse gas.

It's tough to get this kind of information across, but it is always evolving. In the case of nylon, there are new green chemical processes being implemented now that will not release nitrous oxide into the environment, so if I were asked this question in six months, I might have an answer different from the one I'm giving you now. Science is an evolving discipline.

● (1715)

Mr. Mark Warawa: Mr. Glover, I can tell you really want to say something.

Mr. Paul Glover: Yes, thank you.

Notwithstanding, I'd like to respond very briefly to some of the other things that we've heard today in a CEPA context with respect to the member's question.

With CEPA today, independent of the time, it is important to understand that CEPA does allow for a process to publish an assessment, receive comments from the public and industry, and then respond back. Again, not defending times one way or the other and the length of time it takes, there are two important points to note. As you're hearing today from the debate—and this is what makes our job so simple—we see this every day. It would not be uncommon for somebody unhappy with an assessment we would do, on either side of the fence, to say, well, here, consider this—here's new evidence, here's a new formulation. There are a lot of times when people are not happy with our decisions, an indication that we should go back and do it again.

Quite frankly, we don't. We take a weight-of-evidence approach. We take a look at the new evidence that's brought forward and we don't redo it. We ask: does this in a material way change the conclusions? That's the method we use. We've heard that with the speakers today. That QSAR, that weight of evidence, published data, that's what we take a look at. We're constantly being bombarded with new information—please consider this, please consider that, reassess. We take a look at that, but we don't always reassess. We consider that from a weight-of-evidence approach and then make a decision about whether it's important to revisit a decision.

The other thing to note is that CEPA, through the existing substances, does allow us, as the science changes, as it evolves, to revisit any substance we've assessed, if we feel scientific information has changed or exposure or uses might have changed that would lead us to come to a different conclusion. We can choose to reassess and we are constantly presented with new information and consider a weight-of-evidence approach.

The Chair: Thank you.

Mr. Weinberg.

Mr. Jack Weinberg: Thank you.

Let me say something briefly about PFOS and phthalates and then draw a more general conclusion from it.

I think the important thing to watch on PFOS and PFOA, and this is certainly now being discussed in the Stockholm Convention, a group that is looking at new chemicals, is the science of what else breaks down to those. There's quite a belief in some evidence that virtually all the perfluorinated compounds will transform in the environment to PFOS and PFOA, but there's a lot of scrambling now to make that connection. The question in the Stockholm Convention is whether just to list PFOS or whether to list the other substances that break down to PFOS in the environment.

With regard to phthalates, this I think is more illustrative of one of the problems that I didn't mention that are important for your consideration in CEPA. The IJC in the early 1990s talked about sunsetting chemicals. This raises what's sometimes called the “sunrise issue”. If you're sunsetting chemicals, then what are you bringing in as alternatives? There are two ways, I believe, of looking at the sunrise issue.

With phthalates, initially there was absolute denial there was any problem with any phthalate, ever, and it took an enormous amount of activity by scientists and public interest against an extremely powerful lobby to demonstrate particularly the neonatal effects and other serious effects. Eventually, certain phthalates were banned for children's toys and other such uses. Although phthalates are not persistent, they are so widely used that people and the environment have large burdens of these, not because they persist, but because they're re-exposed so frequently. You have the same body burdens that you would have with something that's persistent.

The way it works with this and other chemicals is a lot of times many very similar chemicals can achieve the same function. You defend one as long as you can defend it and then you bring out a new one and then it will take 15 years to build a case on that one. On the one hand, the sunrise problem is a difficulty in the way new chemicals are often promoted. You take one that's structurally and chemically very similar to the one you're phasing out and you put it in because you know you've got 15 to 20 years before the case on that one can be made.

Generally, and I think this is something reflected in CEPA and that should be changed, the sunrise problem comes up in a different way, and in a way that's often misused. We heard about dry cleaning—and it's not trichlorethelene, it's perchloroethylene, the four carbon—

● (1720)

Dr. Joe Schwarcz: No, it's trichlorethelene. The tetrachloro can be used as well, but perchloroethylene is cheaper.

Mr. Jack Weinberg: Well, anyway, we can debate. I believe in Canada most dry cleaning is perchloroethylene. It's actually an issue I once worked on quite extensively. I know that in just the last two weeks California came up with a phase-out of perchloroethylene in dry cleaning. There are a number of alternatives. The most interesting are various water-based systems, but the example that was given here was carbon dioxide, which maybe is too expensive for certain uses.

The important thing about carbon dioxide is that in fact Coca-Cola would be very surprised to find out that the manufacture of carbon dioxide is a very dangerous method. A lot of the carbon dioxide that's used commercially is captured as carbon dioxide by-product in distillation and so forth, which delays its release to the environment. It's not actually new manufacture.

In general, there are often burdens placed in the sunrise. That is part of the difficulty in coming up with alternatives. It is often the case that if it's not just like the one that caused the problem—which the industry then likes—and it's a really different solution, then the sunrise problem is raised, with all kinds of reasons suggesting you don't know enough about that one to follow it.

That's reflected in CEPA. Any chemical introduced after 1986, as CEPA now stands, requires a very rigorous process to be approved; for any chemical grandfathered in before 1986, you don't even need any information on it; you can delay it. The effect of that is to inhibit innovation. There is a trend toward green chemistry, but the current situation is that the burden of coming up with a substantially new alternative approach is subject to enormous regulatory hurdles for the purpose of buying more time for what exists.

One correction I would strongly urge is that you put old chemicals and new chemicals on a par. New chemicals should not be given a higher hurdle than old chemicals; in that way, we can encourage green chemistry. We can encourage the development of alternatives that are safer and less hazardous without its becoming something that is unintentionally discouraged.

It would mean you'd need to have good data on all of them. I don't want to lower the burden on the new chemicals, but unless you bring the same burden up for all chemicals, you are discouraging innovation.

Thank you.

The Chair: I would remind members and our guests that we're now going to the second round. We have five minutes for the second round, so I would again ask you to keep it as brief as possible. We still have a number of questioners ahead of us.

Mr. Rodriguez is next.

[*Translation*]

Mr. Pablo Rodriguez (Honoré-Mercier, Lib.): Thank you, Mr. Chair.

All this is extremely interesting, but sometimes a bit difficult to follow for someone without a background in science or who only joined this committee a short time ago.

I want to come back more specifically to the Canadian Environmental Protection Act. In your opinion what should be the two or three main recommendations that result from this review process?

[*English*]

Dr. Gail Krantzberg: Mr. Chairman, I do have five minutes and then unfortunately I have a flight.

The CEPA process is very good in principle. I think the fundamental guts of the documents, in my opinion, are sound. The problem comes with its implementation. It's heavily based on risk assessment and risk communication, risk management, not on risk reduction, and very little evidence of the application of the precautionary principle, on which it's based. So there's a lot of risk communication, and a previous member asked again whether the public is adequately informed.

It's very frustrating to speak to some of the individuals associated with trying to implement actions under CEPA when one hears that a predominant strategy for risk reduction is risk communication. It's not actually reducing exposure. It's not actually implementing a precaution. It's just communicating to people that there are dangers associated with exposure to certain substances.

"Relative risk" is a term that's extremely confusing. One must remember what risk is voluntary and what risk is involuntary. So when we hear about relative risk, we hear, well, what's the risk of exposure to this substance in a product compared to the risk of flying or crossing the street, which are voluntary actions.

The risk of exposure to a chemical in a product is a problematic area for CEPA. Some of the substances we've been talking about today are in products. Mercury is in thermometers. Mercury is highly neuro-toxic. But under CEPA, you can't regulate the mercury in thermometers because it's a product.

Synthetic musks that are in all the stuff that you used today when you got up and took your shower, such as the soaps that have no purpose except cosmetic—some of which are endocrine disrupters, and others may be carcinogens—have no function. Yet we can't regulate them under CEPA because it's in products. So regulation of chemicals in products is something CEPA needs to grapple with.

And there are actual pollution prevention actions and initiatives that demonstrate adherence to the precautionary principle.

Those would be three major areas.

Finally, on the monitoring piece, which the previous member had asked about, monitoring does need to be improved. I know that the health ministry would probably welcome the appropriate level of investment in monitoring and toxicological studies to understand what the threats to human health are and what the trends in body burns are over time.

● (1725)

The Chair: Thank you very much. We understand that you do have to leave to catch a flight.

I know, Mr. Glover, you'll be wanting to respond. I saw you nodding there.

Are there other members?

Yes, Mr. Weinberg.

Mr. Jack Weinberg: I'll be very quick.

One is timelines. The characterization process worked because there were mandatory timelines and resources. These processes go on forever unless there are clear timelines.

The second is building on the precautionary approach—what I think you've been calling "reverse onus"—but I think what's important is that for chemicals that are on the market you need data, and there must be a requirement that the data are provided.

A third is that you need to balance so that new chemicals and old chemicals have the same regulatory burden. It's good to require data for new chemicals, but if you're not also requiring data for old chemicals, that creates a barrier.

Fourth, the failure of CEPA to include chemicals in products has been a severe limitation. There are a lot of examples I could go into if we want to go into discussion, but much of the chemical exposure—certainly in health exposure but also environmental exposure—stems from chemicals in products, and CEPA has very weak powers with regard to chemicals in products.

Finally, on the special recognition of vulnerable populations and vulnerable ecosystems, and with regard to those, the two that should be singled out for special mention are the Great Lakes ecosystem and the far north. Again, on the reasoning for that, I can go into more detail. In the far north, people are being highly exposed to chemicals they get no benefit from whatsoever, just by long-range transport, and the same process is going on in the Great Lakes. Those are having, in both regions, profound health effects.

Thank you.

The Chair: Thank you.

We could go to Mr. Harvey.

Mr. Schwarcz, if you could get your answer in possibly on Mr. Harvey's question, please do.

[*Translation*]

Mr. Luc Harvey (Louis-Hébert, CPC): Mr. Schwarcz, I would like first to talk about the study on dioxine emissions in Italy. I have four children, all girls. Should I be concerned?

[*English*]

Dr. Joe Schwarcz: Actually, the Seveso experiment—or the accident that turns out to be an experiment—is interesting in the sense that there was a very large single exposure. It was not a continuous exposure. There's a big difference between chronic toxicity and acute toxicity.

We really didn't see very much acute toxicity in Seveso. There were animals that died. People suffered chloracne; this is the basic symptom of acute dioxin toxicity.

The ongoing study has monitored the health status of these people, and there is certainly no obvious increase of any kind of cancer. We would have seen that. There are debates back and forth about whether or not there's a subtle increase, but there certainly was no major increase.

Again, that was a single exposure. What we worry about is exposure over a long time to small amounts. If you were living near Seveso at that time, the chances are that there are no consequences.

● (1730)

Mr. Luc Harvey: It was not really a question.

[*Translation*]

There is one thing I would like to know. You have to be able to make a real assessment. When you spoke earlier, you sounded like politicians, because both viewpoints were valid. Some might feel that it is based on a belief rather than on reality. You said more than once that this was a possibility.

Is it possible to undertake DNA or human cell studies with the use of a simulator, particularly to determine the reaction to various chemicals? You spoke about a test to see if moose could fly. I suppose you could drop them from the top of the Peace Tower, but that is probably not the best way to go.

Will simulators be soon developed to determine the effects on the human body? At the moment, speculation is really only hit or miss.

[*English*]

Dr. Joe Schwarcz: Today there are numerous in vitro tests, as they're called—laboratory studies quite aside from animal studies based on cell cultures. A lot of the time carcinogens and of course drugs used against cancer are tested on cell lines in the petri dish or on cells implanted into animals.

Our techniques here are really quite sophisticated, but there are also numerous examples showing that when a substance you found to be cytotoxic and showing some form of danger in cell culture has been tested on an animal, it just hasn't done anything—or it does something worse than you found. The animal is far more complex that just single cells.

To answer your question, there are certainly tests available today that are being implemented; many decisions are based upon that. Whether to go ahead with researching a new drug, for example, will depend on what you find initially in cell culture; based on that, you may decide to go ahead or not go ahead, but it's still not 100% indicative of what can happen in a living system.

[*Translation*]

Mr. Luc Harvey: That is not what I was asking. In medical research, it often takes up to 10 years to observe the side effects of a drug or to see if the medication is truly effective.

What I have in mind is a device similar to the computer-generated models that can be used to determine the resistance of construction materials, for example. Are there any electronic or computer-based simulators that could reproduce cell behaviour, etc.?

[*English*]

Dr. Joe Schwarcz: Yes. In fact, this is happening. In chemical research today we very often use a technique known as molecular modeling. You use a computer program. You introduce into it the structure of a molecule and the structure of so-called receptors on cells. These are protein molecules into which chemicals fit in a way that is essentially very much like a key fitting into a lock: it turns the device on or off.

You can manipulate a molecule on the computer screen to see how it would fit into a receptor. You can change the structure of it and analyze how it fits and then do the study on an animal, and you will find that it works.

You are absolutely right; there are molecular modeling techniques today that are going to be used. The cosmetics industry, obviously, is very interested in this because—-

[*Translation*]

Mr. Luc Harvey: How reliable are they?

[*English*]

Dr. Joe Schwarcz: I would say that right now these kinds of models are not as good as testing it in a life system, but it's coming. I would suspect that in the next decade we're going to find computer simulations that are going to give a very good analysis of the potential of a specific chemical to do harm or not, especially in the area of environmental hormone connections.

I can't predict the future. I know that it sounds to you like one side says this and one side says that, but that is unfortunately how it is in this business. There's the old story where an arbitrator was listening to two people discuss things, and he listens to one side and he listens to the other side. A third person asks how they can both be right. The answer to that is, “You know what? You're right too.”

That's the way it works. Science rarely gives absolutely conclusive answers. But I think we're going in the right direction, and based on the science available to us today, we're going to be able to make better predictions on what substances to worry about and what ones to worry less about.

I know that you'd like a more concrete answer. Unfortunately, I don't think that a more concrete answer is possible at this point.

The chemical complexity of life is so immense that to try to model it in the laboratory or on a computer is a tremendous challenge. The human body is the most complex machine that exists on the face of the earth. It is far more complicated than any computer, and we're not going to be able to model it on a one-to-one predictive basis.

● (1735)

The Chair: Mr. Harvey, we have to move on. Thank you.

I can't resist. I thought Mr. Rodriguez would be wearing his soccer jersey. I saw it, but he failed to wear it..

But Mr. D'Amours and love, I mean, this has got to fit.

Mr. D'Amours.

[*Translation*]

Mr. Jean-Claude D'Amours (Madawaska—Restigouche): Thank you, Mr. Chairman.

We are discussing a review of Canada's Environmental Protection Act, which calls to mind something that is happening in my province of New Brunswick. It involves an incinerator.

I would like to know what you think about this. I feel that it will impact the quality of life for the people and the environment. At the outset, there were plans for either New Brunswick or Quebec to burn hydrocarbon products coming from the United States. We are now told that they might also add PCBs. What do you think about that?

This is not happening in my own area, but in a neighbouring riding. Of course, incinerators do pose a risk for the environment, particularly because the material has to be transported. We say that we want to improve the quality of life for our citizens. Therefore, we want to protect the quality of the environment and of our ecosystems.

I would like to know what you think about the impact of incinerators on the environment.

[*English*]

Mr. Jack Weinberg: Thank you.

First of all, let me say that PCBs were originally identified for phase-out in the 1970s, and I think that it's quite amazing that in the U.S. and Canada large stockpiles still remain untreated. And part of the reason that they remain untreated is the debate over incineration and the fact that communities don't want them incinerated, for very good reasons. At the same time, when they are stored perpetually, they continue to leak to the environment many of the same pollutants that people are worried about from incinerators, such as what we called earlier the toxic equivalency of dioxin. PCBs also express the same toxic equivalency, so you can get the same effect by not incinerating them.

It turns out that quite a while ago Canadian scientists and entrepreneurs developed some very excellent technologies for destroying PCBs. The one I'm most familiar with is gas-phase chemical reduction. It was a former Environment Canada scientist who developed the GPCR technology. The company went out of business, not because it didn't work—every time it was tried it worked brilliantly, it's the one technology that NGOs all over the world really liked—but because the incinerator industry was so strong that they were always able to basically monkey-wrench any effort to move away from incineration.

So GPCR is a very good alternative. There are others. I'm less confident in some of the others. There's something that sometimes is called base-catalyzed dechlorination and sometimes is called base-catalyzed decomposition. They changed their name somewhere along the way. In some of the early applications there were problems, and I'm told that some of the more recent applications have had fewer problems. There may be some others, but those are the two.

If you have purely liquid PCBs and that's all you're dealing with, the BCD might be cheaper, although I don't know. I'm more partial to the GPCR technology, although the Canadian company that was vending it has gone out of business and we don't know if somebody is going to pick up the intellectual property and go forward.

So, yes, things like PCBs need to be addressed. Transportation is a big problem. Storage is a big problem because these are semi-volatile compounds. So if you transport it and then you move it around and you store it and then you put it into the incinerator, you can have as much toxic pollution of the environment coming from the transportation, storage, and handling as you would have come from the incinerator.

All these things have to be taken into account, but I believe incinerators are the wrong technology for this. I believe the right technology is there. But the fact that both Canada and the U.S. have sat on their PCB stockpiles, and therefore the people who develop new technologies could never make a profit out of them, not because they didn't work, but because they didn't get business, is a problem.

I don't know what it has to do with CEPA, but I think that's a very important issue and I believe there are good solutions. I believe they've just been monkey-wrenched over the years because there's a very mature industry that builds and operates incinerators, but also that operates and sells all the flue gas cleaning equipment that goes along with it. They've been very politically effective, and the start-up industries that had better ways of doing this just didn't have a chance.

Thank you.

● (1740)

[*Translation*]

Mr. Jean-Claude D'Amours: If I may, Mr. Chairman, I would like to ask one short question.

I think we have a problem when we import pollutants from another country in order to process them here. As you said, transportation is a concern, as it can represent as great a risk as any other aspect. It is often worse.

From an environmental point of view, do you think that, if we need to process certain substances, that we should process our own products, and not those of our neighbours? Processing our own toxic material already represents a risk for our environment. Taking in other peoples' toxic waste will certainly not help our own environment .

[*English*]

Mr. Jack Weinberg: I recall—I think it was in the eighties—there was a shipment of PCBs from the U.K. that came to Canada and I think when it arrived at the docks in Montreal there was so much protest they had to send it back. Certainly importing PCBs from the U.S. to Canada makes no sense, because they will just go to the place with the weakest regulatory environment and therefore the cheapest regulatory environment.

What they say in the U.S. is that while Canada can sometimes have very good laws, they're not really enforced, so it's still cheaper to do these things in Canada. I think that if they're being moved to Canada, there is a reason. If they're being moved to a poor community in Canada, then you know what the reason is—it's a cheap way to deal with the problem. They should deal with it at home.

I have a different attitude toward toxic pollutants from Africa, the poor parts of Asia, and the poor parts of Latin America, in that I am more sympathetic to them being returned to the countries that originally produced them, and in that the countries do not have the technical capability or the resources to deal with that. So that's a different question and it's more complicated.

But I would say that if there's a desire to move any type of waste from the U.S. to Canada, it's a money question and it's not the Canadian dollar and it's not the cost of labour. It's a money question, as there is expectation that the environmental controls will be weaker here.

My advice is to strengthen your environmental controls and your enforcement but keep out the wastes from other countries as well.

Thank you.

The Chair: We'll move on to Mr. Vellacott. This will be the last question, and then we'll give Mr. Glover and Ms. Taylor the opportunity to finish off.

Mr. Vellacott.

Mr. Maurice Vellacott: Thank you.

My understanding, if my information is correct, is that Health Canada is apparently planning a national study in which about 5,000 people will be monitored for toxic substances over a two-year period starting 2007 to 2009.

When I first became aware of that I was wondering—I've got three questions, and this first one would be along these lines—is that long enough? At first blush I would think it might take a longer-term period of time to gauge the effect, but there are maybe some things I don't understand about the study. Mr. Glover might have to comment in respect to that, but I'd appreciate if Dr. Schwarcz or also Mr. Weinberg would respond on that.

Secondly, if I understood correctly what Mr. Weinberg said regarding these many "fat-loving chemicals"—and I don't know what percentage of chemicals out there are "fat-loving chemicals"—where then does the dangerous reading come? The "total body burden" I think was the term used. It's the matter of how much there is in the fat of the body, if you will.

With that question, then, are we off the mark when we're doing testing—biomonitoring, if you will—by way of people's blood and urine, when in some of these cases it's more that the detrimental effect is picked up in terms of the fat of the human body? That's where the dangerous readings would be detected. So I have that question. I don't know if it was PBDE that was the one referenced there—possibly—but that is my second question.

And lastly is that it intrigued me a little bit—and it's nothing novel, it's been said by lots of people and it was remarked here a few times—Mr. Weinberg, when you commented about things like a "predisposition" to prostate cancer caused when you were a fetus or pre-born.

Are we really way, way too late in terms of a lot of our testing then, and should we be getting some sense earlier on? The gig is up, so to speak, if most of this effect and the predisposition is already caused by pre-birth, at the fetal time. Are we way behind the eight ball on that? And as I said, in effect the gig is up when most of the damage....

I have a son who is 12 years old and he has Asperger syndrome. This will be an interesting debate, I guess, over the years ahead. There seems to be a rapid increase of these childhood...autism and so on. Are these caused in the pre-birth period of time? Maybe we're way, way too late in terms of any of the biomonitoring and testing. Should we be doing it at the fetal stage?

Those are my three complicated questions that could take some long time in response, I'm sure.

● (1745)

The Chair: Who wants to start?

Mr. Schwarcz.

Dr. Joe Schwarcz: Biomonitoring is a long-term project because what we're really interested in is the direction in which things are going. To me, absolute numbers at this point don't mean very much because we really don't have any reference values.

The reason that blood is monitored is that's the easiest thing to do. Tissue sampling is of course much harder, and people would not line up to have fats taken out of them—some might, yes...large amounts of fat. There's the underlying hypothesis that when you're measuring blood levels it's also indicative of the fat-soluble compounds of what is stored in the fat. Also, you have to remember the same argument, at least, that I've used: just because something is present in the blood doesn't mean that it's doing harm; just because something is present in the fat doesn't mean it's doing harm either.

This business of bioaccumulation I think very often is quite misinterpreted, and it's very difficult to do justice to these issues in a few minutes. What everyone really should be doing is reading a book called *The Dose Makes the Poison*, by Alice Ottoboni. I would really suggest that, because it will give you a lot more insight than what we can give you here. It's just a superb book on toxicology. It gives you the timeframes that are really relevant and what bioaccumulation means, and whether or not you should worry about the build-up in fat, which is not necessarily the case. Just because it's there doesn't mean that it's doing any harm.

You have to start somewhere. We started the process of biomonitoring. The CDC in the U.S. does this extremely well, and we will see the direction in which things are going. The important thing is to see whether or not you can relate those blood levels to any observable phenomenon in humans, and so far, as far as I can tell, that just hasn't happened. That is really what we're looking at, but in order to see that you have to have the data. So we are in the data-accumulating stage.

The question that you posed about whether or not we're too late is a very good one. Well, you have to start somewhere. We may be too late now, but we may not be too late for the next generation. We have to gather the data and see what we can make of it.

● (1750)

Mr. Jack Weinberg: Thank you.

I think that whatever you do is good. I think longer term...but you may want to learn from your initial study and then update your methodology. So I don't know whether you're talking about one long study or multiple. But it's true that the body burdens only tell you what's present in the body. They don't tell you very much about what impact it's having. I'll come back to that.

On the question of blood in urine, there's a lipid content in blood; blood carries fat. And because there's a lipid content in blood.... I don't know the formulae. There's a pretty good formula that you can use—blood sampling as a surrogate for estimating the lipid content from the blood content. So yes, I think, for all practical purposes, blood sampling will give you what's available in the fat. You don't just multiply it by how many litres of blood you have in the body. You have to do a more complicated calculation on that.

Urine sampling will tell you things, but the chemicals that bioaccumulate are of special concern. They tend to be fat-soluble and not water-soluble. Most of the toxic purification processes of the body are water-based. The kidneys are very good at removing water-based toxicants from the body and they're very bad at releasing fat-based toxicants from the body. But there is some metabolism going on and I believe information can be gained from urine sampling, both with regard to the stuff that is water-soluble and also in terms of breakdown products as well from some of the other substances. In terms of the chemicals of the kind we're talking about, blood sampling gives you a better picture of what's going on in the body.

Are we too late? We were probably too late in 1930 when we went down some of these chemical pathways, but you're never too late, because there's always going to be another generation. On the information that I reported about the prostate, this was information I learned in the early nineties at a workshop that the IJC sponsored. What's too late is if the information is not acted upon. The hurdles of taking the information that's out there in the scientific community—getting through the noise, the manufacture of doubt, the delays—means what's too late is the action that's taken by legislators, regulators, and so on. So in a way we can refine our knowledge. It's absolutely true. When PCBs were introduced, they were introduced because they were considered to be very stable and very non-toxic. Now everybody in Canada and the U.S. agrees that PCBs are bad.

When the Stockholm Convention was negotiated, I heard the same story from I don't know how many countries: PCBs can't possibly do any harm, because the electrical people wash the grease off their hands with the PCBs after they're done. They take it home, and in some countries they use it as a surrogate for mustard oil in cooking. We haven't seen any problems. So the anecdotal information of no harm will continue to the day that legislative and regulatory action is taken.

The Chair: Mr. Weinberg, I'm sorry to interrupt, but we are rapidly running out of time. I want to give Mr. Glover and Ms. Taylor....

We're over nine minutes now into the five-minute session, Mr. Vellacott.

We will go to Mr. Glover.

Mr. Paul Glover: Thank you, Mr. Chair.

Very briefly, in response to the questions posed by the honourable member, this is the brief history of why we are doing this. As the head of this program in Health Canada, I felt that I was running or steering this ship without a rudder. I put a challenge to the staff to figure out how we could do this, how we could get some biomonitoring program up and running, so we would have a baseline that we could use as a starting point.

By no means, in no way, do we consider 5,000 to be sufficient. This is a one-time study. We've got to start somewhere. Let's figure out how we start. I'd like to congratulate Statistics Canada, which was here the last time with us and is partnering with us. Part of the reason it's 5,000 and part of the reason it's a limited number of things is that's what we could put together. We need to look at how we make this a more systemic program that is ongoing that will help us.

That, I think, is a very brief history as to how that came about and the limitations we see. We do recognize it's a needed start and I would just like to underscore that.

The other thing is that with respect to whether we are starting too late, one of the other things we're interested in is looking at maternal core blood samples, and we do have some work under way with a number of hospitals and universities so we can determine for pregnant mothers what's in their unborn child, etc. That will also be a very informative baseline. We are trying to work as early as possible into this.

I would like, Mr. Chair, to come back to some of the other issues raised, but in specific response to those questions, that's my answer.

● (1755)

The Chair: Basically, we are rapidly running out of time.

Shall we hear, as quickly as possible, from Mr. Glover and Ms. Taylor?

Go ahead.

Mr. Paul Glover: I appreciate the opportunity to participate here and to witness the debate today.

I would like to bring back to the committee members what CEPA does in terms of many of the issues you have heard, because I think that is fundamentally the task before you. So I will remind you of what CEPA does and doesn't do and where we, as departments, stand on that last question with respect to biomonitoring.

As I've reported in previous meetings with you, we do think biomonitoring is a tool to measure progress, to identify trends, to help us set priorities and to interpret the results of the actions we've taken. Are these actions doing enough? Do we need to do more? It is not a silver bullet, but it's an important piece of the equation to help us measure success.

I would also like to point out that not everything can be measured through biomonitoring. Yes, the persistent bioaccumulative substances matter. There are some things that are highly reactive and that change when they get into the body; those make us sick, and there are ways to look for them. Those also matter because of their impact on human health and the illnesses they create, so we need a system that deals with all of those.

In terms of the other question with respect to measuring success, CEPA has three basic goals: pollution prevention, environmental protection, and human health protection. If you summarize CEPA, that's what it does. The key is, what are the measures for measuring success against those three criteria? As administrators of the act, I think the greater the clarity there is on how we will be measured in the future, the easier it will be to make sure we're putting the tools in place to answer that question in the future. So CEPA has three basic goals, and the question is the criteria we use to measure those, and that, obviously, is very challenging.

We have heard about precaution, we have heard about risk-based.... Just to remind members, CEPA is both. As I reported in previous appearances, it is risk-based, which is how we do our work...hazard and exposure in order to understand risk. But it also is precaution, as is inherent in the act, allowing us to act in the absence of certainty. So CEPA does have both of those elements right in the act, which you've heard debated. They are tools within the act for us to use, and we try very hard to do that. You have heard comments about our ability to implement, but I would just point out that both of those elements are there in the act today—risk-based and precaution.

The other thing is that we've heard about the burden of reverse onus, and putting the burden of proof on industry. CEPA does allow us to do that. On the new substances side, that's required; companies have to come forward and provide us that data. It starts off with that burden of proof for new substances. For existing substances, we are allowed through section 71 to demand data from industry; we can put the onus on them. Those tools are also within the act.

Finally, to sum up, we heard about REACH. I'd just like to point out that REACH has not yet passed in Europe; it is and has been subject to significant debate, and has been amended. That's not to say we should not to look at it, but Canada does have, in my opinion, a solid piece of legislation, and the categorization piece that we are going to complete by this September is world-leading. No other jurisdiction has done what we're about to complete, to go through every one of our existing substances and ask, are they persistent, bioaccumulative, and inherently toxic; what is the potential for exposure to humans; and are they hazardous to humans? We will then be able to set priorities that are far ahead of any other jurisdiction's, as we move forward, in terms of what we assess, how we assess it, what we choose to risk-manage, how we choose to risk-manage, and what burdens we want to put on industry in terms of information or action.

With the number of substances that are in use in any country, it will always be important to prioritize, whether it's the Europeans with REACH, or the Americans with their stewardship programs in the high-production, high-volume challenges. CEPA does have within it that categorization, which will help us as a country to set priorities for where we go with the next round of things. I think that's an important element, as we measure success. We are ahead of most of the world in terms of our existing substances.

Thank you.

● (1800)

The Chair: Thank you.

Ms. Taylor.

Ms. Mary Taylor (Director, Legislative Governance, Department of the Environment): I think, rather than focusing on measuring success, I'd just like to add a couple of clarifications.

Mr. Mario Silva (Davenport, Lib.): Mr. Chair, I have a point of order.

The Chair: Yes.

Mr. Mario Silva: I have no problem with our continuing with this discussion, but we haven't moved a motion whether we want to extend the time or not.

The Chair: Would you make that motion?

Mr. Mario Silva: Yes.

I move that we extend in order to finish hearing Ms. Taylor.

(Motion agreed to)

Ms. Mary Taylor: I just want to clarify that CEPA does allow us to regulate products. We can regulate the sale, the manufacture, and the import of products.There are aspects of products we cannot regulate, such as the design of a product, but CEPA does provide some mechanisms for us to regulate products, and I think that's important to remember.

With respect to the import and export of hazardous waste, CEPA provides a framework for us to regulate. There's a process in place for regulating the import and export of products such as PCBs. That is something CEPA does provide for and we are very actively involved in.

Interestingly enough—and maybe this does pull us back to measuring success a little bit as well—we heard a lot about dry cleaning regulations, but that's actually one regulation that we have in place. We are regulating the release of dry cleaning fluids. As a matter of fact, that is one regulation where we used one of our new enforcement tools. In the last fiscal year, we issued more than 100 environmental protection compliance orders to effectively make dry cleaning operations stop until they got their products under control and brought them into compliance.

That is one the ways we've been using CEPA. I thought I would raise that with you today.

The Chair: Just to clarify, there was a discussion between two of our guests regarding dry cleaning and the chemical that was being used. There was disagreement over which one was right—

Dr. Joe Schwarcz: It wasn't really a disagreement. All of these chlorinated hydrocarbons can be used as dry cleaning agents. Whether it's perchloroethylene or trichlorethelyne just depends on whether we have one hydrogen instead of a chlorine. They're both feasible. Perchloroethylene is more economic, and that's the one more commonly used. Trichlorethelyne, or TCE, is the one that's been in the news a lot because it's more toxic.

Mr. Jack Weinberg: TCE is used for degreasing metal parts, primarily. It's rarely used for dry cleaning.

But I don't know if that's relevant to this—

Ms. Mary Taylor: We're actually regulating both of them. We're regulating the perchloroethylene used in dry cleaning and in degreasing. Both are being regulated.

The Chair: Thank you.

Any other questions, just briefly?

I'd like to thank our guests. Certainly we appreciate your being here. We appreciate the department people being here and clarifying. It's been extremely interesting. Thank you very much.

Dr. Schwarcz, perhaps we can have you back sometime, closer to Valentine's Day, to talk about love.

Thank you.

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