HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

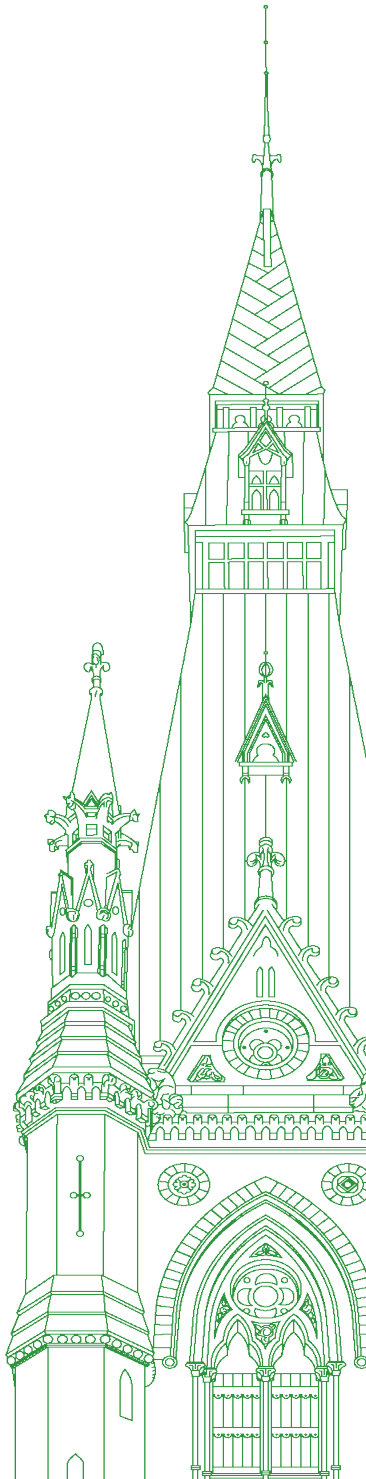
44th PARLIAMENT, 1st SESSION

Standing Committee on Science and Research

EVIDENCE

NUMBER 071

Tuesday, February 6, 2024



Chair: Mr. Lloyd Longfield

Standing Committee on Science and Research

Tuesday, February 6, 2024

● (1100)

[*English*]

The Chair (Mr. Lloyd Longfield (Guelph, Lib.)): Welcome to meeting number 71 of the Standing Committee on Science and Research.

Today's meeting is taking place in a hybrid format pursuant to the Standing Orders. Members are therefore attending in person in the room and also remotely using the Zoom application. We also have witnesses here virtually.

For those participating virtually, we have a few rules.

You may speak in the official language of your choice. Interpretation services are available for this meeting. You have the choice at the bottom of your screen of floor, English or French. If interpretation is lost, please inform me immediately, and we'll ensure that interpretation is properly restored before we resume proceedings.

For members in person, proceed as you normally would when the whole committee is here. I'll recognize you by name before you speak. Also, keep your earpiece away from your microphone so that we don't have feedback events for the interpreters. We want to keep our interpreters safe throughout the meeting.

All comments come through the chair, please.

Pursuant to Standing Order 108(3)(i) and the motion adopted by the committee on Monday, September 18, 2023, the committee is resuming its study on the integration of indigenous traditional knowledge and science in government policy development.

It's my pleasure to welcome Dr. Erika Dyck, professor of history and tier 1 Canada research chair in the history of health and social justice; Lindsay Heller, indigenous fellow from Simon Fraser University, Morris J. Wosk Centre for Dialogue, by video conference; and Dr. Monnica Williams, Canada research chair and professor at the University of Ottawa.

Each individual has five minutes for opening comments, after which we will go to our rounds of questioning. I'll signal you when we're getting close to time.

To start us off, we'll have Dr. Erika Dyck for five minutes.

Dr. Dyck, you have the floor.

Dr. Erika Dyck (Professor of History and Tier 1 Canada Research Chair in History of Health and Social Justice, As an Individual): Thank you very much.

Dear honourable members, my name, as mentioned, is Erika Dyck. I am a historian and a Canada research chair in the history of health and social justice at the University of Saskatchewan. I have been studying the history of psychedelics for over 20 years. My research has been published in a number of scholarly books, articles, documentaries and podcasts.

Initially, my research focused on medical experiments that were conducted in Canada in the 1950s and 1960s using substances like D-lysergic acid diethylamide, or LSD; mescaline, from the peyote cactus; and psilocybin, which is found in magic mushrooms. This research includes the studies conducted in Saskatchewan that coined the term “psychedelic” in 1957.

By the 1970s and 1980s, psychedelic drugs had earned a reputation as dangerous substances, with links to a history of mind control, violent behaviour and unwanted side effects like flashbacks. Canada, like most western nations, signed a UN convention in 1971 agreeing to ban the use of psychedelics in human research due to concerns about their capacity to cause addiction and stimulate unwanted behaviours. The only exception to this designation was indigenous uses for ceremonial or religious purposes.

The relationship between indigenous uses of psychedelics in Canadian history is particularly complicated. While there are a handful of registered religious exemptions stemming as far back as the 1950s, much of this history is not well understood and not well documented. For much of Canadian history, indigenous traditions were under threat, and some were expressly prohibited by the Indian Act.

While the word “psychedelic” was not coined until 1957, the concept of altering one’s state of consciousness, of course, is not unique to psychedelics. However, due to colonial pressures to adopt western medicine and laws prohibiting indigenous spiritual traditions, our documented understanding of indigenous customs with psychedelic practices or principles is severely limited.

The clearest evidence comes from the Native American Church, which has been a registered religious organization since the late 1950s. There has historically been one legal chapter in Canada and several legal chapters in the United States and Mexico. The Native American Church includes many sacred features, including the use of the peyote cactus, which contains a psychoactive alkaloid called mescaline. Mescaline was first identified by German chemists in 1896, but the practice of peyotism stretches back hundreds of years.

Most written accounts of peyotism, or the worship of peyote, came from the church as it sought legal recognition in the early part of the 20th century. That formal recognition represented a syncretic religion, with a blending of Christian and indigenous practices of worship, including the medicine or sacrament of the peyote cactus. The peyote cactus does not naturally grow in Canada. It grows in parts of Texas and northern Mexico. Anthropologists have tracked peyote pilgrimages and kinship ties to that region for centuries, further suggesting that practices long predate the formal documented recognition.

There are several historical reasons why we lack information about indigenous practices with psychedelics.

First, the practices were prohibited, stigmatized or explicitly illegal, meaning that without oral testimonies or direct information, we lack documented detail about these practices that sometimes occurred in secret.

Second, ethnobotanists and anthropologists working with indigenous communities across Canada have suggested that many ceremonies, practices and traditions do not single out a psychedelic feature. By that, I mean there are diverse practices or traditions that involve different components, which might include fasting, dancing, singing and praying. These are features that can produce alterations in consciousness. Fixating on the inclusion or exclusion of a psychedelic plant or fungi has distorted our western understanding of how these traditions use sacred plants in combination with other observances.

Finally, even academic researchers who studied these indigenous traditions in the 1940s through to the 1970s were subjected to the stigma associated with psychedelics. Some now suggest there has been a mycophobic bias in the literature, suggesting that these studies were not taken seriously or published at all.

Historically, Canadian medical researchers played a leading role in developing therapeutic applications for psychedelics. In my opinion, the best examples of effective treatments from the 1950s and 1960s came from researchers who genuinely engaged with indigenous leaders and who paid close attention to how ceremonies were structured. Collaboration between the Native American Church and psychedelic researchers in Saskatchewan, for example, led to the development of some of the first published protocols on the safe use of psychedelics in group therapy. Native American Church leaders were crucial in informing non-indigenous researchers how to prepare for an experience. In return, non-indigenous researchers testified at committees like this one about the cultural significance of the peyote ceremony.

● (1105)

Thank you very much for the time to speak on this important issue.

The Chair: Thank you very much for your testimony. It's right on time.

We'll now go to Lindsay Heller for five minutes.

Ms. Lindsay Heller (Indigenous Fellow, Simon Fraser University, Morris J. Wosk Centre for Dialogue, As an Individual): Thank you, Mr. Chair, for this opportunity to share some important observations I have made over the years through my experience weaving indigenous knowledge and science with western science.

My name is Lindsay Heller and my Cree name is Nikamowin Maskiki. I'm a member of the Michel First Nation in Treaty No. 6 territory. I spent 10 years as a pharmaceutical research scientist at the Centre for Drug Research and Development. I'm now in my fourth year as a fellow at SFU's Centre for Dialogue, where my focus is on weaving indigenous science and western science in both of these educational settings and informing policy for a variety of levels of government.

The many wise witnesses who have come before me have spoken about the importance of establishing respectful and reciprocal relationships with indigenous knowledge-keepers when collaborating on projects and policies that involve weaving indigenous knowledge with western science. I agree that this is a critical first step. Doing your homework is as well. Prior to reaching out to indigenous knowledge-keepers, learn what has already been done, where there have been errors and issues and what the community is facing, which may come into play when attempting to collaborate and weave indigenous knowledge and western science.

As somebody who worked for many years in a lab focused on a western science approach, I want to take the little time I have today to ensure you understand that the often-perceived hierarchy of western science over indigenous science is not correct. This assumption often leads to errors, risks, repeating of harms and the failures of projects and policies that attempt to weave indigenous science and western science together.

I have often heard western scientists and government officials justify their belief in the supremacy of western science based on the value of the scientific method. They infer that indigenous people do not utilize the scientific method, which they consider the pinnacle of western thought. The scientific method follows a fairly linear path: observation, formulating a question, hypothesis, experimentation, analysis, conclusion, peer review and results sharing. Western scientific experiments follow this formula and results are published in scientific journals. This publication of results establishes a hierarchy where published scientific data is best and anything else is inferior.

I always counter this argument by stating that indigenous people, too, follow a scientific method. The consequences of failure go far beyond a failed experiment or exclusion from a journal. Experimentation by indigenous people is built on observations and interpretations of the natural world, which allow us to predict how parts of the world work. These experiments are repeatable and reliable, have rigour, are accurate and follow a peer-review process. If indigenous people didn't have a sound and reliable scientific method, the results could be much more devastating than one typically imagines.

If our observations about the sea ice in the north or our predictions, experimentation, data collection, peer review and results sharing are incorrect, it can mean falling through the ice and perishing. If our observations and results are incorrect with regard to traditional plant medicines, it could mean poisoning our families and not passing on our genes to the next generation. If our observations and results sharing about the movement and distribution of a caribou herd are incorrect, it could mean our community has no meat for the winter. While this kind of experimentation may take more time than it would in a laboratory setting, the rigour, accuracy and replicability are sound. Is this not also the scientific method? When the consequence of not using this indigenous scientific method could be death, would you not rely on this data and view it as valuable, intelligent and reliable?

I share these observations so that when governments establish programs and policies to work with indigenous knowledge-keepers to weave indigenous knowledge and western science together, they do so from a place of respect and understand that our methods are sound and deserve careful consideration and inclusion. Whether you're looking at the Species at Risk Act or creating policies that involve curriculum development or any number of programs that would benefit from the inclusion of indigenous knowledge, it is critical to do so from a place of respect, without an assumption that the western scientific way is more important or trustworthy.

You must consider reciprocity. What is the community or individual gaining from collaborating with you? You need a deep knowledge of what that community is facing. Do they have clean drinking water and adequate housing? If they don't, perhaps their priority isn't the same as yours.

You must also understand that there may be an inherent distrust of government due to decades of theft, disenfranchisement, violence and broken promises. The process of healing and reconciliation must be at the forefront of these kinds of projects and policies. After all, it isn't an indigenous world view that has gotten our world into this mess of climate change, mass extinction, resource extraction disasters and food insecurity. It is a western world view that did this. By working together and weaving our indigenous knowledge systems, approaches and values together, I believe we stand a chance of getting ourselves out of this mess.

Thank you.

● (1110)

The Chair: That's terrific. Thank you very much for your comments and your presentation. I look forward to the questions on this.

Now we'll go to Dr. Monnica Williams from the University of Ottawa for five minutes.

Ms. Monnica Williams (Canada Research Chair, and professor at the University of Ottawa, As an Individual): Thank you for having me here.

My name is Dr. Monnica Williams. I am an African American and permanent resident of Canada. I'm a board-certified and licensed clinical psychologist and tenured professor at the University of Ottawa in the School of Psychology, where I serve as a tier 2 Canada research chair in mental health disparities. I graduated from MIT and received my doctorate at the University of Virginia.

My research focus is culture, racism and mental health. I have founded mental health clinics in Virginia, Pennsylvania, Connecticut and Ottawa and a refugee clinic in Kentucky. I provide supervision and training for mental health clinicians for culturally informed, empirically supported treatments. I also provide diversity training internationally for clinical psychology programs, scientific conferences and community organizations.

Prior to my move to Canada in 2019, I was on the faculty at the University of Pennsylvania medical school, the University of Louisville and then the University of Connecticut, where I had appointments in both psychological science and psychiatry. I've published over 200 scientific articles and am a member of the Royal Society of Canada. My current research includes addressing barriers to care, the assessment of racial trauma, improving cultural competence in the delivery of mental health care services and interventions to reduce racism.

Although I'm not an indigenous person, as a scholar of racism I can confirm that indigenous people experience striking social and societal discrimination that adversely effects their mental health and well-being. My work with indigenous people in Canada includes in-depth mental health assessments for several indigenous women, including some who were subjected to coerced or involuntary sterilization by the Saskatoon health authority.

I also conducted a nationwide study of the mental health needs of diverse Canadians that was published in the International Journal of Mental Health last year. The findings with respect to indigenous people were significant and dovetailed with other research indicating that indigenous people receive a poor quality of care. Sixty-nine per cent said they had experienced difficulties accessing mental health care, significantly more than white Canadians. Indigenous Canadians reported more financial barriers to care than other groups, and even more than other Canadians of colour. The most striking of the findings was that half reported negative experiences with mental health care providers, which we know creates a barrier to treatment adherence and follow-up care.

There are a few critical take-home messages here. For one, we need to incorporate indigenous approaches into how we deliver health care to make it more relevant and palatable for indigenous citizens. Second, we need more indigenous clinicians. There are not enough indigenous providers to provide culturally relevant care to this often highly traumatized population. In 2018, the Canadian Psychological Association drafted a response to the 2015 Truth and Reconciliation Commission report and stated that there are likely fewer than 12 indigenous practising or teaching psychologists in Canada. That would mean that only 0.0006% of the 19,000 psychologists in Canada identify as indigenous.

Notably, psychologists function not only as mental health care providers but also as researchers and scientists. Those best suited to integrate indigenous traditional knowledge and science into government policy are indigenous people themselves. Not only do we need to ensure the active involvement of indigenous people from various regions within Canada, but these efforts need to be led by indigenous scholars and approved by indigenous leaders.

We need to first ask ourselves why there are so precious few indigenous scientists and scholars in Canada in the first place. Less than two years ago, I admitted the first indigenous student into the University of Ottawa's doctoral program in clinical psychology. I've had a front-row seat to the institutional barriers she faces to get the education she needs to become a scholar who can conduct the very research needed to benefit her community.

Earlier last year, I conducted for the Office of the Auditor General a study of the experiences of racialized employees in the federal government. This included the Canada Border Services Agency, Correctional Service Canada, the Department of Justice, the Public Prosecution Service of Canada, Public Safety Canada and the RCMP. The employees shared with us over and over again that rules and policies were ignored as employees of colour experienced unchecked racism that prevented career advancement, and they were subject to retaliation if they reported it.

We can come up with all the good policies we like, but you must understand that if you don't address the systemic racism that infects our institutions at every level, none of it will make a difference. Adopting indigenous knowledge requires us to understand and address the discrimination and systemic barriers that make these changes so challenging in the first place.

Thank you.

● (1115)

The Chair: That's terrific. What a great panel of witnesses. Thank you all for your testimony this morning.

We're now going to move over to questions.

First, I'll welcome Dr. Brendan Hanley as a substitute. We also have Darrell Samson online as a substitute. It's great to have you join our committee this morning.

Our first round of questions goes to Corey Tochor, from the Conservatives, for six minutes.

Mr. Corey Tochor (Saskatoon—University, CPC): Thank you, Chair, and thank you to our witnesses.

My first question is for Professor Dyck.

Regarding the potential therapeutic benefits of medicines like psilocybin, can you speak to the contemporary research on the medical benefits of these therapies?

Dr. Erika Dyck: To be honest, I feel that Monnica Williams is better positioned to answer this question. However, briefly, over the last 12 years, the evidence on psilocybin applications for therapeutic use has really blossomed. There is a growing number of papers and an enormous amount of evidence now suggesting that psilocybin is performing well in clinic trials. The American FDA has identified psilocybin as a breakthrough therapy for the treatment of major depression disorders and for post-traumatic stress disorders.

● (1120)

Mr. Corey Tochor: Let's switch to you, Monnica, for a really brief synopsis of your answer to that question, and then I have a follow-up question for Professor Dyck.

Ms. Monnica Williams: There is so much research being done right now in the U.S. and Canada. In fact, Canada has been a leader in some of this work, showing the benefits of substances like psilocybin for end-of-life distress and for other indications, such as anxiety, PTSD and depression. Substances like MDMA, ketamine and many others are emerging.

Mr. Corey Tochor: Thank you very much.

I have a follow-up question for Professor Dyck.

We keep hearing that there are some failures with the special access program. In your mind, is it working?

That may be a group question, with Monnica following up as well.

Dr. Erika Dyck: I am a historian looking at this from 10,000 feet, so Monnica will have a more close-up impression.

As I understand, the special access program has been increasingly used under the subsection 56(1) exemptions in the last couple of years. This puts more pressure on psychiatrists to act as the gatekeepers in order to access psychedelics. I think there are still challenges with respect to access to good and safe supplies.

Certainly, that was a problem even three years ago, when the subsection 56(1) exemptions came through. I think it is moving in the right direction now, but there still seems to be a backlog.

Mr. Corey Tochor: Monnica, just to focus on the psilocybin aspect of things, what needs to be improved for the special access program to work?

Ms. Monnica Williams: First of all, we need more clinicians who have the right training and skills to conduct psychedelic-assisted therapies and prescribe those medicines. I think the nature of the program does pose barriers to people who may be marginalized, who may have fewer resources and who may not have access to psychiatrists. If they do, they may not have the type of relationship they need in order to feel they can trust those providers.

We really need to do a deep dive and look at the demographics of the people who are accessing this program, including racial and ethnic demographics, to ensure that it's being rolled out equitably. To my knowledge, this information isn't really being collected in a systemic way, so that would make it really hard to say conclusively who this program is benefiting and who it isn't.

Mr. Corey Tochor: Thank you so much, Monnica.

I have another question. You're probably aware that last fall there was a subcommittee in the Senate that produced a report entitled “The Time is Now” regarding the federal government failing veterans on psilocybin. Can you speak briefly about the benefits of these therapies for veterans?

Ms. Monnica Williams: We know that many of the empirically supported treatments for PTSD, although they are effective, are not effective for everyone. So many people who have served our country are suffering from PTSD and are not able to have a good quality of life because they've done all the treatments, they've tried all the medicines and they're still suffering. We see many veterans going on trips to places like Jamaica and South America, where they can get psychedelic substances to relieve their PTSD. Believe me, they wouldn't keep going and being sent if it wasn't working.

We really owe our veterans the best we have to offer, and that means if other things haven't worked, why not psychedelics? We have the research that shows it can help so many people, and I think it would really be a vital option for veterans.

Mr. Corey Tochor: Thank you, both of you. I believe my time is up.

The Chair: You have a minute.

Mr. Corey Tochor: Then I'll go back to Professor Dyck to talk about the indigenous aspect.

Do you know of any indigenous individuals who have harmed themselves or others on psilocybin? I cannot find any. Throughout your study of the history of indigenous people, are there any you know of?

● (1125)

Dr. Erika Dyck: I don't know of any offhand. I have been working closely with current and past leaders of the Native American Church. Mostly, they work with peyote and not psilocybin, but there have been no reported abuses in that specific transaction.

Of course, as our other witness Lindsay mentioned, there are all sorts of other issues going on. Access to drinking water is a huge issue that overwhelms the conversations about particular drug abuses, if you will. I think that can't be taken out.

The Chair: That's great. Thank you.

Before we go to the next questioner, Dr. Williams, could you raise your mic a bit so that it's level between your mouth and your nose? That's perfect. Thank you. We'll see how that works for our interpreters.

We'll go now to Ryan Turnbull from the Liberals for six minutes, please.

Mr. Ryan Turnbull (Whitby, Lib.): Thank you, Mr. Chair.

Thank you to all the witnesses for being here today. Those were fascinating opening remarks. I really value the perspectives you're bringing to this important study.

Ms. Heller, I really enjoyed your opening remarks. I found that they challenged the dominant paradigm or the supremacy of western science, which is something that many of us, as settlers, probably take for granted.

I really appreciated your comment that indigenous traditional knowledge follows a rigorous scientific method and has rigour and soundness, and that there would certainly be dire consequences if some of your observations and results turned out to be false. I think it is a really good way of pointing to accuracy and the imperative that this knowledge is really accurate and applicable. I take all of that as great opening remarks. You almost made me start to think about how we as western settlers need to decolonize our understanding in a sense. I think the systemic barriers are really entrenched in our ways of knowing.

I wanted to ask you what we're up against. I'm sure that if we are allies in the quest to remove those systemic barriers and really give indigenous traditional knowledge the legitimacy it so rightly deserves.... I want to rephrase that because we shouldn't be giving anything to anybody. At the same time, I think it's probably many of us settlers who have to change our mindset.

Can you help us with that? What advice could you give us that would aid in that journey?

Ms. Lindsay Heller: That's a good question. Do we have an hour to talk about it?

Mr. Ryan Turnbull: Yes.

Ms. Lindsay Heller: I think Monnica brought up, importantly, that there are not enough indigenous scientists and people like me doing this work. I think it's about support through curriculum, through removing barriers in educational systems and through allowing indigenous people to see themselves at the front of the classroom and in the curriculum. It's about looking at assessment differently and to really decolonize education so that indigenous people can bring the gifts they receive through knowledge from our ancestors, through ceremony and through our language and weave that together with the really important things we learn in those institutions to become chemists and biologists.

Additionally, I think it's about having respect and collaboration at the forefront of all of these projects. That's why I decided to take my short amount of time to position indigenous knowledge as sound, intelligent and reliable, because that's often not done. I think it's about going into these partnerships and taking the time to listen—listening to hear instead of listening to respond—and getting to know the people you're working with. Get to understand what language and ceremony mean to us. Then, based on those respectful relationships, move on in a collaborative, relational way.

Mr. Ryan Turnbull: Thank you for that response building on the concept of respect and reciprocity, which I think you mentioned in your opening remarks as well and seems to be so foundational in this conversation.

One things that's interesting to me is that when I think about that, I think about it as standing on mountaintops. There's western science and individuals with that way of knowing standing on a mountaintop. Then there are indigenous knowledge-keepers standing on a mountaintop. We both need to be looking across and looking up to each other, in a way. To me, it is a sign of respect and reciprocity when we can each recognize the unique value in each other's way of knowing.

Sometimes in our conversations I feel like we're still treating western science as having primacy and thinking about how indigenous traditional knowledge can add on to western science or complement it. What if we flipped it the other way around? I think it would look very different.

I wonder if any of the panellists today could talk about this. If we were to give indigenous traditional knowledge primacy, which I think it deserves, how would western science complement it?

● (1130)

The Chair: We have about 45 seconds.

Ms. Heller, if you can, move your microphone up a bit for the interpreters.

Who is going to start on this one?

Ms. Lindsay Heller: I can take 30 seconds.

In my very last statement, I talked about how indigenous world views aren't what got us into this in the first place. I think it's about taking the time to really understand what an indigenous world view is and what it means to be relational with all living things.

We're not standing on top of the mountain. We're standing beside the mountain. We're standing with the mountain. We're standing with all the living things. We're going into ceremony to remember who we are and to remember the responsibility that we have to all living things. If government officials and western scientists can take a bit of a pause and reorient their axis to understand that we are all part of a complex web of connections, then I think we can move forward in a good way.

The Chair: Thank you. That was a great question and a great answer.

Now we'll have Maxime Blanchette-Joncas for six minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas (Rimouski-Neigette—Témiscouata—Les Basques, BQ): Thank you very much, Mr. Chair.

My first questions are for Dr. Dyck.

Dr. Dyck, you are a history professor and hold a tier 1 Canada research chair in the history of health and social justice. According to my limited readings and various discussions with a number of professors, science ought to be universal, and free of ethnic or national considerations.

What I've seen today is a discussion about western knowledge and indigenous knowledge. Could you tell us how, throughout history, science may have been classified on the basis of its ethnic or national nature? For example, we don't currently refer to algebra as Arabic science, even though it was invented by Arabs.

I'd like you to explain to me how a branch of science can be described today as being ethnic or national.

[*English*]

Dr. Erika Dyck: That's a very difficult question.

I think there are two things. One is the funding bodies that give priority to and sometimes create particular kinds of steps in the definitions of how we identify science and how it's funded and, therefore, some of the projects that can go forward. Those, of course, give a kind of national presence to it, and they create a different set of priorities. That undergirds some of the ideas about the national containers that science exists in.

If we think about this in the context of indigenous knowledge, though, to Lindsay's point, I think reordering and imagining different priorities and different aspects of science that we don't necessarily consider within the western frame of science, such as spirituality, for example.... If we come back to those veterans, some of what is being treated here is a spiritual set of disorders that has not, for the last 75 years, fit neatly into our western biomedical ideas. I'm saying western, not national.

By rearranging that and reimagining those priorities, I think we can imagine a different way of integrating indigenous knowledge or other ways of seeing and prioritizing into health needs, and the relationship to the earth is part of that.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Dr. Dyck.

So what you're saying is that indigenous knowledge ought to be incorporated into western science.

How can that be done? For example, for something to be considered knowledge, it must have been verified. That means that it can't be an opinion, a hypothesis or a belief.

How then do we go about incorporating this knowledge into science and separating what's true from what's false?

● (1135)

[*English*]

Dr. Erika Dyck: My work with indigenous communities—albeit limited, as I am a settler myself—suggests to me that we have to ask different questions. We have to let other people lead. We have to take cues in other ways.

The question about psychedelics, for example, is an instructive one. Asking about psychedelics doesn't actually get to priority questions within the indigenous communities that I've worked in. The questions are about safe access to housing, to water and food systems, and to education systems for their children. Psychedelics are not really the priority, yet psychedelics are part of the world we live in and sometimes part of the ceremonies that indigenous people are participating in.

It's really a reimagining of the health priorities that sometimes don't necessarily fit into a neat category that we think of as science per se.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Okay.

Dr. Dyck, I just want to understand your comments.

You're saying that a different way of asking questions and of understanding things is needed. Do you mean that the scientific method has to be reviewed when we're talking about indigenous knowledge?

[*English*]

Dr. Erika Dyck: I don't know that we need to re-examine the entire scientific process, but I think there are aspects that warrant a revisiting.

Take, for example, randomized controlled trials. When we think about that in the context of psychedelics, they are measuring a very specific pharmacological action. What they don't measure are all of the kinds of interactions with the environment and all of the kinds of personal and emotional interactions that occur when someone consumes psychedelics.

Indigenous ceremonies don't treat psychedelics like a randomized controlled trial. That completely reorients the interaction and the experience. I think listening and learning about why those ceremonies exist and what functions they serve could be very instructive for imagining what meaning we are trying to extract from that pharmacological reaction.

[*Translation*]

Mr. Maxime Blanchette-Joncas: To conclude, given that time is short, I'm going to ask you a question that I've previously asked other witnesses: How do you distinguish a belief or a tradition from knowledge?

That's what I'd like to know.

[*English*]

The Chair: You have 30 seconds.

Dr. Erika Dyck: I think this is also very difficult. Right now, knowledge for me as a professor counts when I publish things in peer-reviewed literature. Beliefs don't necessarily get me points on my CV.

I think sometimes the systematic ways of giving credit or cultural value to knowledge and belief.... Sorry, belief doesn't get that same kind of cultural credit, and I think that's something our funding systems reinforce.

The Chair: That was a great discussion. Thank you.

We'll move on to Mr. Cannings for six minutes, please.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thanks to all the witnesses for being here today.

I'm going to start with Dr. Heller.

We're in a study about somehow bringing together science—as we normally think of it in western settler societies—and indigenous knowledge. We've heard a number of witnesses use words like “to weave”, “to braid”. I think you mentioned the word “weave”.

Could you expand on how you see these two ways of seeing the world and how we can use both of them in informing government policy?

Ms. Lindsay Heller: I think it's important that you raised this. I'm uncomfortable with the word “integration”; it can often be seen as consuming one into the other. Weaving or braiding is taking the strengths of each knowledge system and putting them together to create something even stronger.

Coming back to what I have talked about in a couple of my comments, it is about an indigenous world view. We see the forest as a “them” as opposed to an “it”. You're much less likely to raze that forest to the ground when you see it as a relative as opposed to seeing it as something there for you to consume and benefit from.

I'm going to leave it at that.

● (1140)

Mr. Richard Cannings: I'm going to dive down into a more detailed example.

Dr. Heller, you mentioned the Species at Risk Act as one example where this process happens. In my previous life, I was on the Committee on the Status of Endangered Wildlife in Canada. It was, I think, one of the first government agencies, or government-adjacent agencies, that brought indigenous knowledge and indigenous knowledge-keepers into its membership. Certainly in those early days it was a bit of a struggle even finding who should sit on there to represent indigenous knowledge. Considering all the things the government needed to be careful about was a difficult matter.

Using that example, I'm wondering how indigenous knowledge has been used in the Species at Risk Act, if you're familiar with it, and perhaps how you think it should be used if you think there are better ways.

Ms. Lindsay Heller: I think when you're talking about particular species and the land protections that are going to come along with SARA, the Species at Risk Act, it's about understanding the populations of the animal before contact. It's about taking into consideration the cultural uses for that animal, thinking about the different land uses that come into play for that particular animal and having somebody, a community, that has a deep knowledge of that land. A land-based perspective is critical, as opposed to officials or scientists who may parachute in and use sound data. Weave together those two approaches to data collection to make decisions about this animal.

I think it's also critical to consider what that community will be facing in the aftermath of coming in and putting in land protections, because oftentimes an indigenous community can be blamed for land use restrictions. The harms they can face when that comes into play are often not considered and must be considered.

Mr. Richard Cannings: I'll continue with talking about some of the issues I've encountered in this space.

For some indigenous knowledge-keepers—perhaps you mentioned this—there's a consideration that in some cases, or many cases, knowledge is considered proprietary to a person or family, and they're unwilling to share it with government policy-makers. Can you perhaps comment on that and on how we can move forward in situations like that?

Ms. Lindsay Heller: I did mention this. There is an inherent distrust because of theft of knowledge. That's why taking the time to establish a relationship with these individuals so you can build that trust.... Why would they want to share that knowledge with you if they feel that it might not be used in a good way that's going to benefit not only them, but their community and all the living beings around there?

Take the time to get to know these individuals, to get to know the historical aspects of what that community has faced and is facing, and go into that relationship to build trust and really establish a basis for doing this work together. If there's a willingness to learn, a willingness to hear the answer “no, that is not our priority”, I think that positions this kind of work in a different way. Indigenous communities and knowledge-keepers are much more likely to want to participate when things are done a bit differently.

● (1145)

The Chair: Thank you. I apologize for having to be the timekeeper on this discussion.

In the next round, we'll have to do some trimming to get us to the top of the hour. We're going to do rounds of three and a half, three and a half, one and a half and one and a half minutes for our questions.

Starting with three and a half minutes, we have Michelle Rempel Garner.

Hon. Michelle Rempel Garner (Calgary Nose Hill, CPC): Thank you, Chair.

I'll direct my questions to Dr. Dyck and Dr. Heller.

Michael Pollan is an American author and journalist and a professor in the practice of non-fiction at Harvard University. In 2020, he co-founded the UC Berkeley Center for the Science of Psychedelics.

If you look at some of the book reviews for his very famous book, *How to Change your Mind*, which talked about the use of psychedelics, they were glowing. “Gripping and surprising.... Makes losing your mind sound like the sanest thing a person could do”, said New York Times Book Review. “Astounding”, said New York Magazine.

It's been amusing to me.... Perhaps that's not the right word. It's been amusing and disappointing to watch the world all of a sudden say that psychedelics could be used for mental health work after Michael Pollan's book. I think this is a perfect example of some of the things you were speaking about, Dr. Williams.

Was there anything fundamentally transformational in Michael Pollan's book or is it just basically a collection of indigenous knowledge? Why does it still take a Michael Pollan to get indigenous traditional knowledge accepted as mainstream practice?

Ms. Monnica Williams: This is true and unfortunate. Almost everything we know about psychedelic-assisted therapy has come from indigenous practices that have been westernized and appropriated with little credit, recognition, glory or money going back to the original sources of this knowledge and these techniques.

If you read the book, which I have read, it reads like a pantheon of white men getting the credit for all of the psychedelic research that's been done in the last century. Unfortunately, this is often how we determine what's important: Did white men discover it and are they talking about it and publicizing it? That's exactly what we see with Michael Pollan's book.

To your point, he is not an expert in psychedelics. He's not a clinician. He doesn't have an MD or a Ph.D., but he gets a lot of attention because he wrote a best-selling book.

Hon. Michelle Rempel Garner: Go ahead, Dr. Dyck.

Dr. Erika Dyck: I think Michael Pollan has synthesized a lot of what people have been saying for a number of years and has put a mainstream gloss on it, which has further damaged or muted the contributions of indigenous people for centuries. He's put a veneer on it that has made it splash into the mainstream, but he does a disservice to the many people who have been working in this field for a long time across a variety of different cultures and backgrounds around the globe.

Hon. Michelle Rempel Garner: I'll just close with this, Chair. In my time pre-politics and during politics, I've always found that the most expeditious way to get something done is to figure out how to get a man to think that it was his idea. I hope this committee can come up with a better recommendation on how to get indigenous knowledge into the mainstream.

The Chair: Thank you for the great insights.

Now we'll go over to Dr. Jaczek for three and a half minutes, please.

Hon. Helena Jaczek (Markham—Stouffville, Lib.): Thank you so much, Chair.

We have a fascinating panel of witnesses today.

Like my colleague Mr. Turnbull, I would really like to commend Ms. Heller for her very clear articulation that a very artificial division seems to be made between what we call western science and indigenous knowledge, which, of course, is based on observational scientific methods as well.

Sometimes it is helpful to counter the discrimination that is clearly there in what is currently considered indigenous knowledge by telling stories. We've heard a bit about psychedelics today, but are there other examples?

Perhaps, Ms. Heller, you could give us some other examples where the weaving of indigenous observational science has been incorporated into research that has had a lasting effect with some sort of positive outcome that everyone can acknowledge. Is there any concrete example of that kind of research that has been published and is widely acknowledged to have advanced science in its full sense?

● (1150)

Ms. Lindsay Heller: Oh, my goodness. There are a number of actively used therapeutics and anti-cancer medicines that were “discovered” by western scientists but were directed to those researchers by indigenous people in the form of plants—Pacific yew, for example—that had been used since time immemorial to treat a number of ailments. Some of these anti-cancer drugs are the largest money-making drugs that big pharma is using, so just in drug discovery alone there are a number of examples.

The anti-cancer medicines are some that I would point to.

Hon. Helena Jaczek: I think that's very helpful.

Ms. Lindsay Heller: Quite frankly, the people—the indigenous communities—that offered that medicine were arguably not compensated for that sharing of knowledge. That's what has led to distrust and the hesitancy to share some of that knowledge now.

Hon. Helena Jaczek: Dr. Williams, as we are moving forward with weaving indigenous knowledge with western science, what about health outcomes? In terms of integration, have you observed or documented any positive results in the usual measures of successful outcome, such as decreased perinatal mortality in indigenous populations and increased longevity, life expectancy and quality of life? Can anything be pointed to as a successful outcome where integration or weaving has occurred?

The Chair: I'm sorry, but we're at the end of your time. Maybe we can get a response in writing. If that that's available to us, that would help our study.

Now we'll go over to Maxime Blanchette-Joncas for one and a half minutes, please.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Chair.

My question is for Dr. Williams.

Dr. Williams, you hold a Canada research chair in mental health disparities. The purpose of this chair is to provide enhanced and more equitable mental health care to indigenous peoples. I'd like you to help us determine how to go about making a distinction between scientific and traditional medicine.

Your research chair's position is that it's not simply a matter of applying science, but also to use inclusive and patient-centred practices that are sensitive to culture. One example is traditional knowledge. I'm going to give you a concrete but tragic example of something that actually happened. In November 2014, an indigenous judge from the Ontario Court of Justice recognized the right of parents in the New Credit indigenous community to refuse chemotherapy treatment for their 11-year-old daughter's leukemia. She underwent treatment based on traditional knowledge in keeping with ancestral rights. It's not hard to guess the outcome. The young girl who, if she had received chemotherapy treatment, would have had a 75% chance of being cured, died two months after the decision.

Based on your experience, how can one decide between the use of traditional and scientific knowledge?

[*English*]

Ms. Monnica Williams: Thank you for your question.

Ultimately, I am a scientist and I use the scientific method, so I would approach this by looking at outcomes and offering to patients what we know about this approach and what we know about the indigenous approach. We may not know anything about an indigenous approach and we would explain it using our own scientific methods, but that doesn't mean it's without value.

Ultimately, it has to be the patient choosing what approach to use so that it's in line with their belief system, whether or not we can back it up with our western version of science.

● (1155)

The Chair: Thank you.

To wind this up, we'll have Mr. Cannings for one and a half minutes, please.

Mr. Richard Cannings: Thank you.

I'm going to stick with Dr. Heller.

Dr. Heller, you're listed as an indigenous fellow at Simon Fraser University. I'm wondering if you could quickly comment on how you think the education system in Canada, especially the post-secondary education system, is adapting to this in creating new positions, such as chairs in indigenous knowledge. We've heard from my friend and colleague Dr. Jeannette Armstrong at UBC. I'm wondering if you could comment on how that trend is going and whether it could be going faster.

Ms. Lindsay Heller: I think, first of all, offering opportunities and scholarships for students is important for trying to eliminate some of the financial barriers they face.

It's about more than simply doing mass hires of indigenous teaching faculty. It's about hiring indigenous leaders for leadership positions and compensating them adequately, and having elders in residence, giving them the same value as tenured faculty and compensating them appropriately.

I think it's difficult for indigenous people to come into an institution when that institution isn't ready to receive the gifts they have, isn't ready to see the value in the community work that indigenous scholars have to put in simply because of the way we are and isn't ready to see the value we put into giving back to our community and making the path a bit easier for our children coming through.

I think it's about hiring more people but also establishing policy changes, changes in governance and changes in curriculum so that all levels of the institution go through a process of decolonization and we can bring our values to the institution.

The Chair: Great. Thank you.

I wish this discussion could go on longer. We've had some terrific meetings, and this one certainly ranks among the top on this study.

Thank you, witnesses, for your insights, your input and your thoughtful answers.

If you have anything else you'd like to share, please do that in writing so we can include it in our study.

Thank you, Lindsay Heller, Dr. Erika Dyck and Dr. Monnica Williams, for everything you've done for our study to get a better knowledge on indigenous traditional knowledge and science in government policy development.

We're now going to suspend for a few minutes while we get our next witness dialed in. We only have one witness via Zoom in the next session. We'll be back in a couple of minutes, as soon as we've done our sound checks. I look forward to the next part of our meeting.

● (1155)

_____(Pause)_____

● (1200)

The Chair: Welcome back.

We'll get going on the second part of our meeting. We've finished the sound checks. Thank you to our tech support for all of that.

Pursuant to Standing Order 108(3)(i) and the motion adopted by the committee on Monday, September 18, 2023, the committee is resuming its study on the integration of indigenous traditional knowledge and science in government policy development.

It's now my pleasure to welcome, via video conference, Dr. Kori Czuy, who is an indigenous science consultant. In person, we have Yves Gingras, professor of history and the sociology of science at the Université du Québec à Montréal.

You'll each have five minutes for your remarks, and then we will proceed to our rounds of questions.

If you're on video conference, you can choose the language of your choice at the bottom. There's English, French or floor.

We'll get started with Dr. Czuy for five minutes, please.

Dr. Kori Czuy (Indigenous Science Consultant, As an Individual): *Tansi*. *Mihkopihêsiw nitisiyihkâson*.

I'm Métis from the Jobin family. As mentioned, I have a Ph.D. in indigenous mathematics and science.

I want to get right to it. I'd like to start with what science is.

Really, it's how we understand, learn from and connect with the ever-changing world around us so that we can survive, thrive and interpret ancestral, land-based teachings and pass them on to the next generation to survive.

The relational definitions that make up science have been disconnected from the land, trees, willows and beavers. They have been disconnected from the human, from ourselves—our body, senses, memory and spirit—and from community. This is all because of the doctrine of discovery.

There has been a disconnect between the mind and the body through Descartes, the Indian Act, capitalism and the clout of the scientific method. This has led to a reductionist, objective, universal and standardized definition of science. Many people today are using it, which is great, but it's understood, passed on and used for scientific research. If these knowledges are the only way of knowing science and the world around us today, what are we missing?

What I like to do with my students is use a framework: How do we open minds and hearts to relational, ancestral or indigenous science? There are three ways I do this: through origins, methods and language.

For origins, what is the origin of scientific “discovery” or knowledge? If we look beyond what we are taught in school through the global or scientific lens, we see that these knowledges are connected in depth with indigenous people. If we look through a scientific lens, we can say that Niels Bohr was the founding father of quantum theory, or a French scientist discovered Aspirin. Really, this is knowledge of the spiritual and energetic connections to the land. Everyone for thousands of years has understood these causes and effects of frequencies of energy called “the spirit”. Now, many call this “quantum”. Women on Turtle Island have had ceremonial and spiritual connections with the healing medicines of willow. Many now know this as Aspirin.

The second thing I'd like to talk about is method. This is how we know science. I want to chat about quantum a bit. They've had difficulty understanding quantum through this western scientific method because it's too universal, standardized and objective. Through an indigenous scientific lens, it is subjective and relational and includes observation, experience and spirit. It's understanding that we learn not just through objective knowledge or the written word but also through apprenticeship, story, ceremony and spirit.

For example, celestial knowledge passed on for thousands of years has been connected to specific locations and star phenomena, such as wolf eyes or thunderbird eggs. Only recently have western scientists claimed to have discovered this knowledge, such as Sagittarius A* or the supermassive black hole in the middle of the universe. This knowledge has been known and gifted through relationality and the ceremony of indigenous peoples for thousands of years.

The third thing I'd like to mention is language. How do we talk about science? It's by using indigenous languages that are relational, connected with the spirit and speaker and verb-based. They're alive. They have a past, present and future. This allows relationality to come to the forefront.

There's a depth of science within indigenous languages. I'd like to give you an example. *Naamóó* is the word for “bee”. The Blackfoot word for “bee” was taught to me by Reg Crowshoe from the Piikani Nation. It means the changes in frequency of the sounds of the bee coming towards you and moving away from you. This is the relational Doppler effect. It denotes a deep understanding of scientific knowledge of movement, relationality, frequencies and quantum, all within this one little Blackfoot word.

I'm not saying that one or the other way of knowing, being or doing science is right or wrong, but there's harm when significant scientific knowledge is discredited and only western, global or scientific methods, methodologies and policies are understood, validated and passed on.

I have three recommendations I'd like to give you.

One, do your work first. Help us and work on this parallel path with us. Reconciliation is the work of non-indigenous people. This was told to me by Casey Eaglespeaker from Kainai. Read the TRC. Read the missing and murdered indigenous women report. Read UNDRIP. Understand those testimonies. Understand what free, prior and informed consent is. Read books by Cajete, Kimmerer, Yellow Bird and Vine Deloria. Listen to podcasts like *Ancestral Science* and *Native Stories*. Most importantly, get some tobacco, offer it to an elder and just listen.

● (1205)

My second recommendation is that the sovereignty of this process must start with and stay with indigenous communities. We have to hand over the decision-making power to communities. It will allow for this to be done in a good way through protocols, with this parallel path and with respect, and will mitigate cultural appropriation, which has been brought up a few times before.

Lastly, we really need to—

The Chair: I'm sorry. Unfortunately, we're at time.

Maybe we can get the third one in an answer or you can provide it in writing.

Dr. Kori Czuy: That was my last one: Take time for this.

Some hon. members: Oh, oh!

The Chair: Very good. It's my bad on that. Thank you very much.

Time is the one thing that we always run out of in this committee.

We'll move on to Yves Gingras for five minutes, please.

[*Translation*]

Mr. Yves Gingras (Professor of History and Sociology of Science, Université du Québec à Montréal, As an Individual): Thank you for your invitation.

This is probably the first time a committee like yours has addressed science and research. The impact of incorporating traditional knowledge into science-based government policies rests on a proper understanding of what ultimately amounts to the philosophy of science and epistemology. One must not, as is all too often the case, think that epistemology is philosophy disconnected from politics.

I am going to try to demonstrate that the problem before you is poorly designed and incorrectly named. As the writer Albert Camus said, incorrectly naming something adds to the world's adversity. The goal is for all government science-based policies to be built on as much openness and consultation as possible. However, "consulting", is not the same thing as "accepting".

What we are hearing at the moment is confused because we are jumping from one word to the next without defining terms and without making distinctions between them. If we are talking about a chair, it should not be called "a table". It's important to use the right words.

In my brief address, I am therefore going to remind you of the key words that run through our entire discussion.

To begin with, there is the word "belief". People can have beliefs, but a belief is something held by someone who believes in something. Someone can have an opinion, which amounts to a hypothesis, but actual knowledge is also possible.

So what is knowledge? It's a statement about the world that has been theoretically validated by generally accepted methods that are accessible to any reasonable person with appropriate training. So if I suggest that there are bears in a given location, I need to verify it for it to become knowledge. Once it has been determined that there really are bears in a specific location, it becomes universal knowledge.

Then there is the word "science". Knowledge is not the same thing as science. I can know that $2 + 2 = 4$, or that $a^2 + b^2 = c^2$. That's knowledge, but it doesn't mean that I can demonstrate what it is. In epistemology, science is defined solely by the fact of explaining phenomena in terms of natural causes. That's what science has been since the 17th century.

We have a lot of knowledge, and others are also aware of the science underpinning this knowledge. We can know, for example, that the *Thuja occidentalis*, which the Iroquois call *annedda*, is a tree whose leaves can cure scurvy. This discovery was made by the local Iroquois in the 16th century, and later attributed in the 17th century to Jacques Cartier. However, it is just knowledge. It was only in the 19th century or later that it became science. It was discovered that it cured scurvy because it contains vitamin C. We no longer need to gather leaves from *Thuja occidentalis* trees because we can produce vitamin C. That's the science that explains why this tree has these properties that we already knew about.

So it's important to distinguish between "belief", "knowledge" and "science". I'm not about to give a history lecture here, but you all know that science is potentially universal. There is no western science, eastern science or indigenous science. These do not exist. There are individuals who made discoveries. The Iroquois knew how to cure scurvy. It's not because of yin and yang that the Chinese have been able to land on the moon, but rather because of their universal knowledge of Newton's laws. Even though Newton was British, it's not British science. The electromagnetic waves that were discovered as a result of the work of James Clerk Maxwell, a Scotsman, doesn't make it Scottish science. A German by the name of Hertz used Maxwell's equations and discovered electromagnetic waves.

Knowledge is therefore potentially universal. Otherwise, it's belief. If I were to tell you that I know God exists, you will no doubt tell me that what I have is a belief, because no accepted approach or methodology available to everyone can demonstrate the existence of God. But people can personally believe that God exists.

In short, I'm telling you right off the bat that there is confusion. If you mix up all kinds of words, you will not achieve anything.

● (1210)

Before describing something as "knowledge", you have to be able to say that it has indeed been verified independently just about everywhere.

In the Middle Ages, the Arab world contributed to science. That doesn't make it Arabic science, but rather algebra, which everyone uses. And yet, *algebra* is an Arabic word.

Potentially universal science is what scientists in every country work at. Terms should not be mixed up.

Thank you.

[*English*]

The Chair: Thank you. I'm sorry to cut you short.

It's a really good start to the discussion. I look forward to the questions on both presentations.

We'll start with Mr. Soroka for six minutes, please.

Mr. Gerald Soroka (Yellowhead, CPC): Thank you, Mr. Chair, for that.

Thank you to the witnesses for coming today.

I'll start with Dr. Czuy.

You've already alluded to how indigenous stories have helped understanding. Can you deepen our understanding of these stories within mathematical and scientific concepts, especially in the context of your work on children and treaties?

Dr. Kori Czuy: Stories are knowledge. When we tell a story, we're teaching—whatever that may be.

For me and for my research, I never connected with math when I was in school. It didn't connect with my body, my culture, my spirit or the land until I realized, when I was doing my master's degree, that there is a way of doing, being and knowing in mathematics that's very standardized. There's nothing wrong with that. It creates a disconnect between humans and cultures and how people have done math for many years.

Think about the significance of trigonometry and how much communities that have navigated the ocean did it in their heads to navigate through the zenith, the horizon and whatnot. It's significant. That is connected to the body and senses. When those ways of understanding, knowing, being and doing mathematics are removed through a way of understanding it that is about memorization, is very standardized and is done in a classroom on a piece of paper, there isn't that connection.

Once I realized there are ways of understanding math that have relationality, I began to connect with it more. That's how I work with children. How do you see the math around you? How do you understand how different angles create different seasons? How do you measure using your body and not necessarily using a standardized ruler? We are our own standardized measurement.

When I was doing my master's degree, I did some work in Papua New Guinea with different number systems. There are different base systems between different communities, from base 32 to base 27. They are all significant and different. I realized how much they would help in understanding mathematics, because these communities, as they're trading between these different number systems, have to interpret and change different systems. That's what we are doing every day. That helps us every day, from telling the time to coding a computer. These are all connected and based in our bodies and in our methods of understanding the world around us. When we learn mathematics in school that is very standardized and disconnected from our body, our culture and our experiences, we don't have that same connection.

Does that answer your question?

● (1215)

Mr. Gerald Soroka: Yes. That's great. Thank you, Dr. Czuy, for that.

My next question is for you as well.

In your role at the Spark Science Centre, how do you facilitate the integration of multiple ways of knowing science?

Dr. Kori Czuy: It's in multiple ways. There are ways that we do it through, first of all, community connections, really starting with elders, knowledge-keepers and indigenous scientists and listening to their knowledges and what they would like to bring in. Secondly, it's through education. How do we create events that are connected to indigenous science so that everybody can understand, so there's a connection that people can get? It's understanding the frequencies of the drums and the healing of those frequencies to different star maps.

We also do a lot of work with schools and communities to bring experiences out to community. That is both in schools and on the land—in communities on the rez. It allows them to see the depth of science within their knowledge. We do this with an experiential workshop that explores the depth of knowledge with Blackfoot stories of the *Makoiyohsokoyi*, or the Milky Way. That is connected to many scientific teachings within this story, and it goes back to that original question about story: Story is knowledge.

The Wolf Trail story has significant scientific knowledge within it—predator-prey relationships and living in balance—and tells specifically about a point in the sky from only a few years ago, if you remember the supermassive black hole that was photographed. We were like, “We've known that for thousands of years. That's the wolf eye or the thunderbird egg.” There are many stories.

There's a lot of science within these knowledges. At the science centre, we try to bring those together and make them relatable for everyone—not just for indigenous communities and children and people—to see themselves in science. I never saw myself in science or mathematics when I was growing up, so to have these experiences would have been significant for me. We're trying to do that but for everyone so that everyone can experience and understand the depth of the scientific knowledges that are within these stories. By “stories” I mean science's connection with the land.

Mr. Gerald Soroka: Thank you for that, Dr. Czuy.

I have just one more question. I know I'm getting close to my time, so you might have to put this in writing and send back to us.

Based on your research and professional experience, what are some of the challenges and opportunities in integrating indigenous traditional knowledge with scientific research and policy-making?

● (1220)

The Chair: Thank you, and that does look like a homework question. That's a very good question indeed.

Dr. Kori Czuy: That's a very big one.

The Chair: We'll have to move on to our next questioner, Valerie Bradford, for six minutes, please.

Ms. Valerie Bradford (Kitchener South—Hespeler, Lib.): Thank you very much.

I'll give you the opportunity to address MP Soroka's question.

Dr. Kori Czuy: Can you repeat the question? It was a big one.

Ms. Valerie Bradford: Yes.

MP Soroka, please go ahead.

Mr. Gerald Soroka: Yes, that's not a problem.

Based on your research and professional experience, what are some challenges and opportunities in integrating indigenous traditional knowledge with scientific research and policy-making?

The Chair: That is basically what this report is all about, so if you could write a report for us....

Some hon. members: Oh, oh!

Dr. Kori Czuy: Yes, I'll just give you that report—that's great.

I think there are so many challenges because, as I mentioned, from an indigenous perspective, there is such a seemingly narrow definition of “science” and how we do, be and know science and math. To me, science and math are under the same umbrella of thriving and understanding the world around us. Unless we can expand the understanding, then I don't know how to move forward.

If we continuously say that we can only do this more objective standardized method of being, doing and knowing science, not just understanding that but implementing it through the written word or a couple of consultations and not through ceremony, then it's not going to be done in a good way. The challenge is, how do we bring together, as mentioned many times before, this idea of breathing and weaving, of braiding? It's bringing these ways of knowing together. All of them have strengths, but often we've only been taught that a western or global scientific way of knowing, being and doing science is the only way to do it. How do we open that up and braid these knowledges together?

The challenge is in really, truly understanding what that means, and the opportunity, I think, is understanding. What are we missing when we're not understanding science in this way? There are so many examples that I can give. There's the example of that one simple Blackfoot word, "*naamóó*", and the amount of science within it, and how indigenous languages are being lost and not passed on to the next generation for how long—

Ms. Valerie Bradford: I want to ask my questions. Thank you for that very fulsome answer, though. That was great.

Thank you to both of our witnesses for the passion and enthusiasm of your opening statements. They were quite remarkable.

Dr. Czuy, I want to get back you. You gave us three things, even though the chair was trying to cut you off with timing. The first one said we should do our work first, and reconciliation is the work of non-indigenous people.

Can you tell the committee more about the importance of building partnerships with the federal, provincial and municipal governments, post-secondary institutions and industry to support indigenous governance and reconciliation? What are your suggestions for how we make that happen?

Dr. Kori Czuy: There are many suggestions. There's the TRC. There's UNDRIP. They're all there. You just have to do them. It's about doing the work to understand what those mean.

We've done our work. I mentioned that there are a ton of resources. A lot of work has been done on how to do this in a good way and how to do this with us and the community.

I have to walk that parallel path everyday. I have to do double the amount of work to do the work I do, and I'm fine with that. Other people have to do that too to understand. They have to do that work—to read and to explore the more subjective way of knowing science. Once you experience that, there is no question what belief is, what knowledge is, and then we're on the same path.

Ms. Valerie Bradford: I wonder if you could expand a bit more on your role as manager of indigenous engagement at the Telus Spark Science Centre. Those of us from Ontario are not even familiar with the Telus Spark Science Centre. We know about the two here in Ontario.

Can you elaborate on your role there and how you employ traditional knowledge in current policies and incorporate it into your daily work?

● (1225)

Dr. Kori Czuy: Number one, it's about community, knowledge-keepers and the elders. That will always be the centre of the work I do. It's about building that trust in myself and building that trust in them to bring forth their ideas on what they think should happen.

Nothing happens without the community. Nothing happens without working with them and creating those relationships. That's the bottom line. That's not necessarily just at the science centre. Any work that is done with indigenous anything should be done alongside communities and should start with listening.

Ms. Valerie Bradford: I think it's wonderful that the Telus Spark Science Centre has a manager of indigenous engagement. I'm not sure that happens at other science centres, so that is wonderful.

Dr. Kori Czuy: Science North is doing some amazing things.

Ms. Valerie Bradford: That's great. That would make sense given that it's in the heart of an indigenous community. Thank you for that. I'm glad to hear it.

The Chair: Thank you.

[*Translation*]

Mr. Blanchette-Joncas, you have the floor for six minutes.

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Chair.

My questions are for Dr. Gingras.

You clearly explained in your address how to disentangle belief, science and knowledge.

I'd like to hear what you have to say about something that is both simple and yet highly complex, and that is whether there is a universal definition of indigenous knowledge?

Mr. Yves Gingras: No, there isn't.

To talk about knowledge, you have to begin by establishing that's what it really is. For example, one hears the expression "traditional knowledge". It's important to clearly understand, epistemologically speaking, that just because something is traditional does not mean it's necessarily true. I'll give a straightforward example: For over 1,500 years in Europe, traditional medicine practised bloodletting. All doctors considered bloodletting to be a panacea. At that time, it was traditional knowledge. When doctors began to wonder whether it really worked, they found that it did not, except in very specific cases of hematology. Doctors therefore stopped practising bloodletting, because knowledge had evolved over time. Calling it traditional knowledge doesn't cut it.

Scientific testing of homeopathy proved that it didn't work. Taking homeopathic medicine may do some good, but it's not science. All that we can really say is that science is evolving. We are no longer in the 17th century, but rather the 21st. Everything around us, like television, is the outcome of new scientific knowledge that enables us to understand the world. Science looks forward, not back.

The previous discussion mentioned education, but that's not the same thing as training researchers. There are many ways to learn mathematics, but if Canada wants to send an astronaut to the moon, it's going to be with differential and integral calculus. It can't be done with traditional knowledge.

The word "traditional" is in vogue, but if the intent is to find ways of including traditional knowledge, I would humbly say that if you go in that direction, you'll get nowhere. People need to be consulted about their environment, and what they say needs to be verified. If what they say is true, then it becomes knowledge.

There is always talk about tradition. I don't have anything against traditions, but the entire history of science shows that traditions evolve. Einstein discovered the theory of relativity. Does that make it Jewish science? No, it doesn't. Einstein was Jewish, but there is no such thing as Jewish science. The Nazis wanted Jewish science and the communists wanted proletarian science, but they don't exist. There is universal science, whether by Russians, Germans, Chinese or Israelis. That mustn't be forgotten, because if it is, we'll be heading in a dangerous direction, as history has shown. Individuals ought not to be affiliated with a community by referring to things like Quebec science. There is no Quebec science. There is no Canadian science, but there are Canadians who are practising science.

It's not just playing with words. If you believe that there is such a thing as Canadian science, you might as well be saying that there is Jewish science and Russian science. It's not true. But there are Russian scientists and there are Quebec scientists and there are Chinese scientists.

If you want to meet your objective, then it's essential to incorporate knowledge. The knowledge that you need to build into scientific policies is not traditional knowledge, but rather knowledge "simplicity", as philosophers put it. It means knowledge that has been validated. How can it be tested? By using known methods. It requires corroboration and calculations. Computers can be used. Methods have been available to do this since Galileo's time, and they are used around the world.

● (1230)

Mr. Maxime Blanchette-Joncas: I'd like to hear what you have to say about the scientific verification process. Some researchers have said that there is a hierarchy of knowledge and that traditional knowledge ought not to be compared to today's scientific data.

Mr. Yves Gingras: My view is that this too is based on confusion. There is no hierarchy of knowledge. Knowledge is true or false. In the 18th century, British and French physicists argued over whether the earth was perfectly spherical or flattened at the poles or the equator. There were two theories, and hence a conflict. What was done? They didn't just say that according to British knowledge it was oblate and according to French knowledge it was prolate. They sent a team of researchers to the poles to measure the meridians. The conclusion was that the English were right, and that the Earth bulges somewhat at the equator because its rotation generates centrifugal force.

When I taught physics at the CEGEP level, I explained to my students that the Earth's rotation generated centrifugal force. This is universal knowledge. It was discovered by Newton, but the fact that he was British is not important. It could have been discovered by a Chinese person. We have to stop messing with the hierarchy. Knowledge is true or false, but not Chinese. Thinking otherwise can lead to serious issues.

Mr. Maxime Blanchette-Joncas: Mr. Gingras, if traditions and beliefs are incorporated into public policies without a validation or verification process, what impact might this have on government policy?

[*English*]

The Chair: Answer very briefly, please.

[*Translation*]

Mr. Yves Gingras: The term "probative data" is widely used these days. It's cutting edge. Probative data is essential. What these words mean is that the accuracy of the information has to be checked. If that is not done, money will be wasted and it won't work. If it happens to work—so much the better if it does—verification will come afterwards.

For example, people shouldn't believe what I might say about Montmorency Falls simply because I happen to live in Montmorency. If you want to check the information, you have to go there. I shouldn't be considered an authority or more knowledgeable about these falls than anybody else. Definitely not. The scientific community needs to verify the facts.

[*English*]

The Chair: I wish we had a blackboard.

Thank you very much. I'm sorry that I have to cut you off.

Mr. Cannings, go ahead for six minutes, please.

Mr. Richard Cannings: Thank you to both witnesses for being here today.

I'm going to start with Dr. Czuy.

You talked quite a bit about stories. It made me think of a Thomas King quote: “The truth about stories is that that's all we are.” I come from a science background. I remember that in my university days, the times when I was really learning things were when I heard stories from professors that put me in a place where I could see patterns and those types of things.

I remember that the only way I learned anything about calculus was studying astronomy first. I always objected to the teaching of biology where.... In university you start with cell chemistry, which is the most abstract way of trying to engage any young person in studying something. If you stuck around for four years, you might actually get out in the woods and see the real world.

Could you maybe expand on that in your work with indigenous science?

Dr. Kori Czuy: Absolutely.

As I mentioned, when working with children—or anyone—the first thing I do is take them outside. One assignment right now for my university class is to go out on the land and learn something. The land will tell you. It will teach you something. Those are the truly relational methods. That starts a story.

When you are out on the land and listening to the leaves and then a few months later the sound of those leaves changes because the water is leaving them and preparing for the cycle of winter, those frequencies can teach you something. There is learning from a squirrel about how they can preserve food. They use specific plants to preserve certain foods. Those chemical and biological methods are something we learn from the squirrel.

Those are stories. How cool would it be to start your chemistry lesson by hanging out with a squirrel and learning how it preserves stuff? We can connect with those stories. We can see this, which is very cool. We can experience it and it creates an emotion in ourselves. It creates a relationship, a relationality and, as you mentioned, a story.

Those ways—not the written word—and those stories are how this knowledge has been passed down. As I mentioned, these scientific stories are not written down in books. There are no clay tablets from thousands of years ago that indigenous people have written on in these lands. It is through stories that are passed on.

Yes, these change as the generations pass them on, but the essence of them is the same. These are, if we want to say it, the "peer reviews". I always mention that the person or community that passed on a story and knowledge to me is the peer review. You can go back to those elders and community members and can validate the knowledge that I said. I may say it in a way that is more relational, which allows us to connect. That's the story method. That's how the connection and knowledge are passed on. That is different than just reading something.

It can be very similar knowledge, but it's about the way it creates connection and relationality that is really brought about in story.

● (1235)

Mr. Richard Cannings: Thank you.

You also mentioned a parallel path. I wonder if you could expand on that. I'm wondering whether you meant that indigenous knowledge and "scientific knowledge" are on parallel paths, because parallel paths tend not to meet. I wonder if there is a way of bringing those two things together when we are formulating government policy, for instance. That's what we're talking about here today.

Dr. Kori Czuy: Absolutely. In that case, a parallel path is more about walking alongside one another and supporting one another. That goes back to wampum belt teachings, which I don't have the rights to pass on or feel comfortable passing on, but look that up. You can offer some tobacco and ask about wampum belt teachings. However, it is about how we walk together on this path, side by side. Weaving things together is how we, similarly, support the path so that it retains its integrity. They're similar, but a little different.

Absolutely, we have to support one another, and the parallel path of.... I've walked in both worlds. I understand how I can do science and how I can speak in both worlds. Asking if we can walk on this parallel path is also about asking other people who are involved to do the same—to do that work and help us come to the same page, to walk together on this path together, so that we can best understand and support one another.

Mr. Richard Cannings: Apparently I'm done. Thank you very much.

The Chair: Thank you. I'm really enjoying this conversation.

We'll go over to Ben Lobb for five minutes, please.

Mr. Ben Lobb (Huron—Bruce, CPC): Thanks very much.

Maybe, in our last committee meeting before Mr. Cannings retires, he can tell us all his stories. We might find those pretty interesting.

The Chair: I liked his quoting Thomas King, who is a Guelphite.

Anyway, we'll go back over to you, Mr. Lobb.

Mr. Ben Lobb: Ms. Czuy, you mentioned, at the end your presentation, free, prior and informed consent. As you are so proficient in mathematics and have worked extensively within many communities, I'm curious if there is a finite period of time, or a calculation and solution, when a business wants to, let's say, build a mine—or whatever it might be—in a community or communities that might be impacted by that mine, which may or may not be for the good.... Is there a way for the community to say that they can check all the boxes and have been consulted and informed? Is there a calculation for that? Is there a way, or is it still a process that every community is working through?

● (1240)

Dr. Kori Czuy: The answer is probably no. Every community is different, and every community has a different level of trust in these processes with whatever organization they may be involved with.

It has to start from the beginning. Any of this work being done, whether it is a mine or whatever else it might be, has to start, from the very first conversation, with "We're thinking of doing this so let's talk to the community." That is the parallel path. That is working together side by side. It's not saying, "We are going to do all this planning, we've invested all this money and the blueprints are out" and then seeing if it's okay, because then it's already done; there's no "prior". Then there's free—they don't have to pay and don't have to work with prior.... There's also informed—they are informed of all of the information available and possible. Even with consent, that relationship has to start from the beginning.

On the timelines, time is a colonial construct, and the community's time is not going to align with business timelines, because their priority is community and seasonal change. When they say they can't make a meeting because it's the same day as a ceremony, that is the priority. It is a respect of those priorities. Again, it's that parallel path.

That's probably not the answer you want to hear, and I apologize for that, but it is the reality. I understand that isn't—

Mr. Ben Lobb: No, I wasn't looking for any particular answer—just your answer.

If you turn on the news every night and look at the strife among what are called the western democracies, you could say, or just the issues in Canada in our cities and in our small communities, there are a lot of issues. What are some takeaways from indigenous communities that might provide some benefit to community or benefit to society? Do you have any comments or thoughts on that?

Dr. Kori Czuy: I do. I'll reference Robin Wall Kimmerer, a member of the Potawatomi community, who wrote *Braiding Sweetgrass*. Read it. She said something beautiful: When is Mother Earth going to be thanked by humans for being here, because she gives so much? Everything we have is from the earth. We take all of that, but when do we give back?

Thinking about that—everything is an ancestor, everything gives us something, everything is alive—how do we give back for the food we bought from the grocery store instead of just taking it and paying for it, and really understand those relationships, those cycles, those relationalities? It's about having that moment of appreciation and respect, and the responsibility we have, really, to the earth and everything around us to give back and have gratitude.

We have a responsibility, being on this land, and we're not really being accountable to that responsibility. Thinking about that will maybe shift some mindsets a bit.

The Chair: Terrific. Thank you. I wrote down *Braiding Sweetgrass*. Indigenous reads month is coming up, and that needs to be on my list.

Thank you for the great questions, Mr. Lobb.

Now we'll go over to Dr. Jaczek for the next five minutes.

Hon. Helena Jaczek: Thank you, Mr. Chair.

Over the break, I did read *Braiding Sweetgrass* by Robin Kimmerer. I found it helpful for the work of this committee.

To bring us back to the work of this committee, our study charges us to make recommendations on "how best to integrate Indigenous Traditional Knowledge and science into government policy development" and "how to resolve conflicts between the two knowledge systems". We've clearly differentiated in this request that there are two knowledge systems.

On a practical basis, Dr. Czuy, could you give us some suggestions on how we can do this? What can the Government of Canada do?

● (1245)

Dr. Kori Czuy: I believe I've already said that. We have to walk alongside one another. How many indigenous people are in that room right now? What is your plan to work alongside communities throughout this process and not just today or through these meetings? I suggest that it's something that communities have to be a part of at every step, not just in these conversations. They're a great starting point, but I think it really is about ongoing work and about, again, doing the work.

I love that you've read *Braiding Sweetgrass*. I think there's a lot there about going to the community and really seeing and experiencing what indigenous science is. Maybe the question of the conflict between indigenous and western science will be removed. How do we bring it together so that there's not a conflict but an understanding?

We understand what the western school of science is. Everybody understands what that is. However, understanding the value of indigenous science, understanding how those methods are different and understanding how we connect with those are a great move for everyone to try to understand.

Hon. Helena Jaczek: Can you give some examples of academic institutions that are operating in this way? Have any provincial governments given us some examples? Are there perhaps even international examples of where this has been effective?

Dr. Kori Czuy: There are many examples. Maybe I can send them in later.

I think examples of the ways this has been done well are when indigenous people are at the forefront. If you look at any of the Maori universities in New Zealand, they are at the forefront of everything. They are at the decision-making level of this work. That's just how it is.

I will say it: Yes, I have a Ph.D. and I work for universities, but the most significant knowledge I've ever been gifted has been from my elders. I say that they have a Ph.D. We can understand the western system, but it is the elders with a “Ph.D. of the land” who really have the knowledge that can help us bring this together. They should be the ones at the decision-making level as well.

Hon. Helena Jaczek: Dr. Gingras, I would invite you to address the purpose of our study with any comments you may have.

Mr. Yves Gingras: I think we need a concrete mechanism, not vague metaphors about collaborating. I'll give you a very simple example.

Peer review is done in science double-blind. Why is it double-blind? When you send in a paper, you want it to be evaluated as if it's good, and you don't want cognitive bias to move it in a bad direction. When you send in a paper, you don't have the name of the individual and you don't have the name of the institution, because if it's written at Harvard University, you may think it's a good paper, so double-blind works. It means that when you are consulting on a policy, you are consulting everyone who has an expertise, and then you make a decision in the end. There are no two ways or no five ways.

Since the 17th century, the Chinese don't say yin and yang to go on the moon. They say that they learned from Newton, learned from Einstein, learned from everyone. I don't want to know the colour of your skin. I don't want to know your community. Do I speak for the Quebeckers? That does not exist. I am a Quebecker, and I make my decision.

For your committee to integrate, I'm sorry, but I think it's simpler than we think. If you are addressing an environment policy in a given place, you have a committee talking to everyone who wants to talk. We already do that in environmental studies. Some people come and say they don't think you should do that for this or that reason, but that reason must be consensual. That's what the Supreme Court decided also. Judge Binnie said that if you want expertise at the Supreme Court, this expertise must be subjected to the usual methods of the scientific community. Why? That's the only way to be sure it's true and can be verified.

The Chair: Thank you.

● (1250)

Mr. Yves Gingras: There are mechanisms and they are not complicated, I think.

The Chair: We've got the thought down. Thank you very much.

Mr. Blanchette-Joncas, you have two and a half minutes, please.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Chair.

Mr. Gingras, I'll continue with you. You gave some examples, even from a historical standpoint, of geocentrism, heliocentrism and Galileo. There is nothing new about humans being faced with two beliefs, no matter what their own religious beliefs or their ethnic community might be. The scientific method was developed to deal with such matters.

I'd like to hear what you have to say about attempts to oppose indigenous people and non-indigenous people, as if they were two homogeneous groups, when they are really two separate heterogeneous groups with internal differences. It means that there may be different forms of knowledge within each of these groups.

Mr. Yves Gingras: Yes, that's true of every community. Everybody knows that, sociologically speaking, there are no homogeneous communities. They don't exist. Let's take Canadians as an example. Some Canadians vote for the Liberals, others for the Conservatives, and some don't vote at all. There are all kinds of people. We have to avoid falling into a form of "neo-racism". It's important to call it what it is, even though it's a scary word. It's sociologically dangerous. In attempting to be kind, forms of neo-racism can develop. The development of democratic societies was based on the premise that individuals are equal and have access to education; that at least was the sometimes false expectation. But if we want to help people who are oppressed, they need grants for education. What they will learn, however, is arithmetic, meaning algebra, as developed by the Arabs. And yet Arabs don't claim that it's their algebra and that Canadians ought not to have access to it. Trying to be specific about everything can lead to the emergence of potentially dangerous attitudes, as history has demonstrated.

It's important to remember that science is universal and that everyone can contribute if they are given the required resources. Schools, clean water, colleges, universities and bursaries are needed. That would make it possible to train people in how to apply modern techniques for improving life and the environment. Prayers alone will not help to combat climate change. It needs to be done with the best available technologies, and everyone can contribute. At the moment, some are contributing less because they are poor and live in places that do not have enough schools. We live in a concrete world, not a world of abstract thought that is often crypto-religious. Though religion is important and personal, science has transcended it since the 18th century. As I previously said, we live in a techno-scientific world, meaning that we can't go back to the past on communitarian grounds.

[*English*]

The Chair: Thank you.

Next is Mr. Cannings for two and a half minutes to bring us home.

Mr. Richard Cannings: Thanks, Mr. Chair.

I'd like to turn back to Dr. Czuy.

Out of my own curiosity, you mentioned some of the different numerical-based systems used by indigenous communities. I remember studying Central American indigenous astronomy systems when I was in university, the Mayans using base 20.

Could you give a few examples of that kind of indigenous knowledge around the world that deals with how they are seeing and making sense of the universe?

Dr. Kori Czuy: Absolutely.

Indigenous languages and indigenous knowledge are not universal, but there is a universality of connection to a specific land. Indigenous people have a spiritual, relational connection to the land, and the land teaches them. From that connection have arisen mathematics, science and chemistry from around the world, and with that, number systems. We use base 10 from our 10 fingers, but many indigenous people use different.... You mentioned base 20 for your 10 fingers and 10 toes. All of these have cultural connections.

A really cool example was taught to me when I was doing some work in Hawaii, if you want some more diverse examples. There's a base four in Hawaii. Four is very significant because fish and fish farms are very significant. It was their food source, so people would go down to the fish farms and the fish traps that are thousands of years old and would catch fish, and they would bring them back to their community. They could hold a fish between each of their fingers, so there were four fish in one hand and four fish in the other.

Because that was so significant, everything revolved around four and base four. When we say that base four is not significant, that it's not valid or that this way of knowing, which is very significant to this community and has deep scientific, mathematical and biological connections, is less valid, it is harmful. I think it's very interesting to embrace the diversities within this knowledge and what we can learn from them for ourselves as well.

● (1255)

The Chair: Terrific. That's a great note to end on—getting into base four and base 20. I have an English degree and a math minor, and the stories between the two of them about how you construct a theorem, whether it's in English or mathematics, are a whole other thing that my head has been going around as we talk.

Thank you to our witnesses, Kori Czuy and Yves Gingras, for your testimonies and your participation, and for making us think in new ways so that we can do our study on the integration of indigenous traditional knowledge and science in government policy development.

Again, if you have any additional information you'd like to share with the committee, it would be helpful for us.

We will be adjourning, but before we do, I will just remind you that we will be getting together on Thursday, February 8, with regard to this study for some more testimony, and then we'll be winding it up next Tuesday with testimony.

Is it the will of the committee to adjourn?

Some hon. members: Agreed.

The Chair: Okay, thank you.

Thank you again to our witnesses.