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# Standing Committee on Science and Research

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Chair: Mr. Lloyd Longfield





## Standing Committee on Science and Research

Wednesday, September 27, 2023

• (1630)

[English]

**The Chair (Mr. Lloyd Longfield (Guelph, Lib.)):** Welcome to meeting number 55 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 attending in person in the room, and we have a member remotely on Zoom.

I'd like to make a few comments for the benefit of witnesses and members, because we also have a witness on Zoom today.

Please wait until I recognize you by name before speaking. For those participating by video conference, click the microphone icon to activate your mike and speak slowly and clearly. When you're not speaking, keep your mike on mute, please. For interpretation, those on Zoom have a choice at the bottom of their screen of floor, English or French. For those in the room, you can use your earpiece as needed and select the desired channel.

Although this room has a powerful audio system, please make sure that your earpiece is kept away from the microphone. If you can, don't play around with your earpiece, because it can cause feedback, which can cause injuries for our translators. The most common cause of sound feedback is when it's too close to the microphone, so I invite participants to make sure that they keep the plugged-in earpiece away from their microphone.

In accordance with the committee's routine motion concerning connection tests for witnesses, I am informing the committee that all witnesses have completed the required connection tests in advance of the meeting.

This is a reminder that all comments should be directed through the chair.

Pursuant to Standing Order 108(3)(i) and the motion adopted by the committee on Tuesday, June 6, 2023, the committee is commencing its study on the use of federal government research and development grants, funds and contributions by Canadian universities and research institutions in partnerships with entities connected to the People's Republic of China.

It's now my pleasure to welcome our witnesses to our committee meeting today.

Virtually, we have Jeffrey Stoff, who's the president of the Center for Research Security and Integrity. From Universities Canada, we have Philip Landon, interim president and chief operating officer.

No stranger to this committee, from the U15 Group of Canadian Research Universities, we have Chad Gaffield back with us. He's the chief executive officer. It was tremendous meeting this summer with U15 Germany and U15 Canada. It was great to be part of those discussions. Thank you for that as well.

For our witnesses, we will have five minutes for your remarks, after which we will go to the rounds of questions.

We're starting off today with Jeffrey Stoff from the Center for Research Security and Integrity.

The floor is yours, Mr. Stoff.

**Mr. Jeffrey Stoff (President, Center for Research Security and Integrity):** Thank you, Mr. Chairman and honourable members of the committee. Thank you for the invitation to participate in today's hearing.

Some of my comments are based on my experience in the U.S. government working on China and research security issues, so much of this is U.S.-centric. However, after leaving federal service, I started an NGO that focuses on assisting allied democracies with safeguarding research. I have learned that many of the challenges and obstacles facing the U.S. are shared among key allies, particularly G7 nations.

European and Five Eyes nations have been putting forth recommendations and policies that call for more robust efforts by research institutions and universities to conduct due diligence or screening for national security risks, usually with respect to government-funded research. While this seems like a sensible approach, I question its effectiveness for several reasons.

First, academic institutions typically lack the resources, subject matter knowledge or incentives to conduct robust due diligence on PRC research partners and sources of funding.

Second, China's increasingly restrictive information environment, including denial of access to some published academic literature, along with its efforts to obfuscate the missions, activities and associations of some institutions, are making conducting robust due diligence and risk assessments too difficult and complex for individual research institutions to do themselves.

Third, and key to some of the larger issues this committee seeks to study, yawning knowledge gaps on the PRC persist. Neither governments nor academia are making sufficient efforts to address them. Several examples include a lack of understanding of the magnitude and complexity of China's state-driven knowledge transfer apparatus and a myopic focus on criminal activity such as intellectual property theft or espionage, which misrepresents the larger threats to the security and integrity of research. In other words, much of the risks and threats posed by China on our research institutions do not involve outright theft.

There is an unknown scale and scope of PRC talent programs that recruit overseas experts and incentivize or task selectees to engage in activities that violate norms of transparency and integrity in addition to the national and economic security threats these programs often pose.

Here are a few examples. In a faculty you have part-time appointments with PRC institutions and they are tasked with placing specific PRC nationals into advanced degree or post-doctoral programs in their overseas institutions, which undermines merit-based selection processes, or exploiting overseas facilities and resources to support undisclosed shadow labs or research projects in China and other related activities.

Academia lacks awareness or incentives to curb research strictly intended for China's benefit. Testimony from a previous hearing noted that Huawei has partnered with many Canadian research institutions, resulting in hundreds of patents generated for Huawei's sole benefit.

What about patent filing outside of formal agreements?

Anecdotally, some U.S. academics have filed patents in China first or in place of filing in the U.S., despite receiving federal funding for that research. In other cases, PRC donors blur the lines between gifts, contracts or grants, i.e., a gift that is supposed to be unconditional actually requires the receiving institution to undertake specific research conducted by specific individuals. I do not know if Canadian institutions are also affected in this way, but I recommend inquiring into these issues given the consistency in China's methods to exploit R and D across the developed world.

There are hundreds, possibly thousands, of subdivisions and laboratories at PRC civilian universities and Chinese Academy of Sciences institutes that conduct defence research, yet they receive little scrutiny if those entities lack a primary mission of supporting China's defence research and industrial base. This has a direct bearing on the key technology areas that this committee is looking into, such as AI, quantum physics, biotech, etc. I am not aware of any efforts to systematically examine which PRC institutions are research leaders in these disciplines and, of them, which ones also appear to seek defence applications to that research.

The U.S. government and national security community, to my knowledge, have made few if any efforts to address this. I presume that other allied governments face even more resource constraints that limit knowledge building in this area.

Similar knowledge gaps exist on PRC state-owned defence conglomerates. These firms control hundreds of subsidiaries at research institutes that act like academic institutions and collaborate

on research globally. Overseas-based researchers may be focusing on the commercial or civilian uses, but the PRC entities directly support defence industries.

These are just some of the blind spots that allied democracies have that constrain our collective ability to safeguard the security and integrity of our research. My organization's mission is to raise awareness in these areas and close some of these knowledge deficiencies through public and private partnerships.

Thank you, and I look forward to your questions.

• (1635)

**The Chair:** Thank you. Thank you for your succinct presentation.

Now we'll call on Philip Landon from Universities Canada, please.

**Mr. Philip Landon (Interim President and Chief Operating Officer, Universities Canada):** Thank you, Mr. Chair.

[*Translation*]

Thank you for the invitation to appear before the committee today to discuss the important issue of research safety.

I am pleased to have the opportunity to provide an account of the steps taken by Canadian universities to strengthen research security, and to discuss how the government can support the security of research conducted at institutions.

[*English*]

My name is Philip Landon, and I'm the interim president of Universities Canada, a membership organization representing 97 universities across the country.

While this is my first appearance before the committee, Universities Canada has appeared frequently over the years, and I'll take a moment to thank our former president, Paul Davidson, for his exceptional leadership during that time.

[*Translation*]

International research collaboration is essential for Canada to remain competitive on the world stage. It fosters the exchange of ideas, talent and resources for the benefit of all concerned.

[English]

Research and technology transfers work both ways, and Canadian research benefits greatly from building on progress being made elsewhere in the world; however, universities also recognize that research collaborations can sometimes carry risks or raise national security considerations. As my colleague at U15 will note, Canada's universities have been vigorously expanding their research security capacity.

Universities are taking their own initiatives to limit partnerships with entities at the centre of this study, including building research security offices, increasing their risk assessment due diligence, conducting security workshops and putting in robust travel security measures. They're also faced with the challenge of doing so in a way that protects both the research and the Canadian researchers involved.

I want to focus on how the government can better support universities on these challenges.

Research security measures must be deliberate and must be very targeted. Broad, ambiguous targets create uncertainty rather than clarity and will slow down the system. When asking researchers to cut ties, they're often presented with two options: wind down their research and potentially abandon a project completely, or continue to pursue that research outside of Canada. In either case, you risk driving IP and talent out of Canada.

Currently there are no federal grants designed to make up for the sudden loss of partnership. Research is extremely specialized, making it hard to find an alternative partner. Ph.D. students who discover that they can no longer be supported on a project they just spent years working on are left looking for other options, often outside of Canada. Meanwhile, as highlighted in the government's advisory panel's report, the Bouchard report, graduate scholarships and federal research grants have stagnated over the last two decades. Researchers are increasingly being asked to do more with less.

Peer countries have been very careful in their approach. Earlier this year, Australia published a list of critical technologies. Rather than restrict research in these areas, this list highlights opportunities they want to promote with other aligned nations while developing more robust risk mitigation practices. The American CHIPS and Science Act introduces very targeted restrictions coupled with very significant research investments.

As this committee contemplates recommendations on this important issue, I strongly encourage you to consider how to ensure that Canada is opening new doors, not just closing doors. It's also important to ensure that smaller universities are not left out of initiatives like the research support fund, so that all institutions receive adequate research security support.

I will close by stressing the importance of taking a country-agnostic approach when working on addressing the challenges of research security. This study is very much focused on China, which, by extension, singles out Chinese students who went to public institutions in China. This affects how the issue is portrayed in the media and may unintentionally exacerbate discrimination against students of Chinese origin.

I strongly encourage the committee to evaluate security threats irrespective of country of origin. Tackling research security challenges in this way will help Canada create a more robust research security framework.

Thank you very much for the opportunity to speak today. I'm happy to take questions.

• (1640)

**The Chair:** Thank you very much for your comments.

Our next witness is Mr. Gaffield from U15.

[Translation]

**Dr. Chad Gaffield (Chief Executive Officer, U15 Group of Canadian Research Universities):** Mr. Chair, thank you for the invitation.

Hello to all the members of the committee.

I'm delighted to be with you to discuss such an important issue.

• (1645)

[English]

I also want to thank you again for all your leadership in focusing public discussion on building a better future based on science and research.

In terms of our topic today, as you have heard from previous witnesses, Canadian universities take research security extremely seriously. This work has increased rapidly in recent years.

Previously, successive federal governments had strongly encouraged Canada's universities to increase international collaboration, especially with China. This consistent encouragement in recent decades emphasized two key reasons for international engagement. On the one hand, Canada sought to benefit from China's scientific and research expertise. On the other hand, Canada saw international collaboration as a way to tackle the world's complex challenges, such as those related to climate change and health.

The result was that the Canadian research community became one of the most internationalized, thereby gaining access to the global pool of knowledge. This approach enabled Canada's successful economic, social and cultural transition into the turbulent 21st century, as recently illustrated by our ability to confront the COVID-19 pandemic.

However, globalization and internationalization can also threaten research security and, therefore, national security, by opening the door to foreign interference. Over recent years, universities have responded to a range of emerging threats. In Canada, defending against these threats is a shared federal and university responsibility. The federal role is based on its national intelligence services. The university role is based on its assurance of the responsible conduct of research.

To take immediate action to exercise this shared responsibility, in 2018 university and federal leaders established the Government of Canada-universities working group to develop policies and practices to maintain the principle of “as secure as necessary; as open as possible”.

Over the years, the working group has met on a regular basis to reach this objective. In September 2020, the working group's discussions informed the federal government's launch of an online portal, entitled “Safeguarding Your Research”, to provide researchers and universities with tools and information about how to protect research security.

In March 2021, the federal government asked the working group to help develop guidelines and processes to integrate security into research partnership applications for federal funding. The result was the “National Security Guidelines for Research Partnerships”, which was published on July 12, 2021. National security assessments are now being systematically rolled out across all federal research agency funding opportunities.

Thanks to support in the federal budget in 2022, universities have continued to hire research security officers and to develop sophisticated risk management frameworks and associated policies and practices. To support this work, in June 2023, U15 Canada published a document entitled “Safeguarding Research in Canada: A Guide for University Policies and Practices”. This document is an evergreen document that will be annually reviewed for updates as practices evolve.

While universities are using public sources to do their own due diligence, they await a clear indication of which entities have been evaluated by our national intelligence services, using their own sources, as inappropriate for any research collaborations. Our understanding is that such lists are forthcoming.

Universities are also working hard to avoid unintended consequences of enhanced research security measures, especially racism or discrimination on campuses, and a decline in research on important, sensitive areas that are crucial for Canada's future.

In this changing geopolitical context, leading countries such as the United States, Japan and Germany are doubling down on investments to increase their own domestic research capacity. It is now increasingly clear, in the so-called globalized 21st century, that such domestic capacity underpins national security and national sovereignty. The massive research funding investments elsewhere have put enormous pressure on Canadian universities, as they struggle to compete for and retain top research talent and the best graduate students.

We must act now to bolster domestic research capacity in order to strengthen national security and sovereignty in an increasingly competitive global environment. Our future depends on it.

Thank you.

**The Chair:** Thank you, all three, for your testimony.

As we get into questions from MPs, I'd like to welcome John McKay, who is visiting us today as a substitute for Mr. Lametti.

It's good to have you as part of the discussion.

For our first round of questions, I turn it over to Michelle Rempel Garner.

The floor is yours for six minutes.

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

Mr. Stoff, or Dr. Stoff—and I apologize if I got your honorific wrong—previous testimony in the committee has suggested that the risks of putting too-strict guardrails or guidelines on publicly funded research, particularly with entities that may cause national security concerns, don't necessarily outweigh the benefits of having a more open research policy in Canada right now.

Do you think that's a parochial viewpoint, given the change in global geopolitics over the last decade?

**Mr. Jeffrey Stoff:** Thank you for your question—and it's Mr. Stoff. I do not have a Ph.D.

I would say that the challenges and the risks associated with what China has become, and the threats associated, are in some ways very unique and kind of deserve their own special treatment and attention for a couple of reasons. The caveat is that the ways that we need to treat, and how we collaborate with, any authoritarian-type nation should be consistent in terms of how we approach engagement. There are some similarities in that sense, but the issue with China, I think, needs to.... Because of the apparatus that China has established, with state-mandated directives to acquire know-how, transfer it, commercialize it and weaponize it, I disagree with the notion that we should be country-agnostic.

• (1650)

**Hon. Michelle Rempel Garner:** I only have a few minutes left, so I need to move on.

I'd like to go to both of the university institutions.

Some of the testimony that we've heard suggests that perhaps the universities should be taking more of an independent role in deciding what constitutes a national security risk or a threat to intellectual property theft. To me, that underlies an assumption that would probably lead to a more balkanized approach in Canada, number one, and also greatly add to institutions' administrative cost of research.

Have your organizations put forward exact positions on what you believe the federal government should be delivering in this regard, in terms of guidelines for federal funding? If so, would you table that with the committee?

**Dr. Chad Gaffield:** I'm happy to answer that.

As you may know, I co-chair the Government of Canada-universities working group. In that role, we embrace the notion that this is a shared responsibility. Our institutions depend on our national intelligence services for their work, and then we do our work. That's why we have this—

**Hon. Michelle Rempel Garner:** Has that shared responsibility with the federal government been defined enough, to date?

**Dr. Chad Gaffield:** I think it's been something that we've been building over a number of years. We've been taking systematic steps forward—

**Hon. Michelle Rempel Garner:** Is it good enough?

It will make it into the report.

**Dr. Chad Gaffield:** Our expectation is that one of the key elements will be the list of entities that have been a priori deemed as not eligible—

**Hon. Michelle Rempel Garner:** Do you believe that list should be static?

**Dr. Chad Gaffield:** I think all our lists are evergreen. That's a word we use for our documents.

**Hon. Michelle Rempel Garner:** Have there been regulations or set requirements around how the list could change and not be static? Have you seen those types of requirements yet?

**Dr. Chad Gaffield:** I would assume that our working group would contribute to those discussions, as we have been in the past—

**Hon. Michelle Rempel Garner:** They haven't been developed yet. Is that something that should be developed?

**Dr. Chad Gaffield:** As I said, I think we work closely with our partners on the shared responsibilities—

**Hon. Michelle Rempel Garner:** Precise recommendations are.... I'm not looking at this from a partisan perspective. The word salad.... It's helpful to have more precise recommendations.

What I'm getting to here is this: Would it be helpful for universities in Canada, research institutions, to have clearly defined guidelines on when that list of entities, whenever it's published, should change so that there is less of an administrative burden and a greater degree of certainty for universities to plan their research activities?

**Dr. Chad Gaffield:** Our hope would be that our national intelligence services, any time they found or had reason to believe that an entity really should not be partnered with, would add it to the list immediately.

**Hon. Michelle Rempel Garner:** How critical is it to have those lists updated on a timely basis, given that granting cycles can generate research contracts that are five years out?

**Dr. Chad Gaffield:** As you know, the granting cycles are all year round, and they go for years. Perhaps more—

**Hon. Michelle Rempel Garner:** It strikes me that some of the things you were talking about with regard to the risk exposure of students, etc., having their research funding cancelled and then the government and the taxpayer having to backfill that, could be avoided if some of those regulations were in fact front-ended at the application time. Would that be a correct assumption?

**Dr. Chad Gaffield:** True, but I think at the moment we are all learning how best to do this. We're constantly refining it, because your point earlier, I think, is key—

**Hon. Michelle Rempel Garner:** How long should it take for Canada to learn and refine at this point?

**Dr. Chad Gaffield:** I think we're among the best in the world. I think we're internationally recognized in terms of our shared responsibility approach.

**Hon. Michelle Rempel Garner:** Do you think that's a fair assumption, given The Globe and Mail report from earlier this year?

**Dr. Chad Gaffield:** Yes, I do. Internationally, we keep close contact with our partners, whether they're in the U.S. or Australia, Europe and so on. I think our approach here in Canada has been exemplary.

**The Chair:** Great. Thank you very much for your answers and questions.

Now it's over to Valerie Bradford for six minutes, please.

**Ms. Valerie Bradford (Kitchener South—Hespeler, Lib.):** Thank you, Mr. Chair.

Thank you to our three witnesses. I'm really looking forward to your testimony.

I will be sharing my time with Mr. McKay today. He wanted to ask some questions of this panel.

Welcome back, Mr. Gaffield. It's good to see you again.

In 2021, Innovation, Science and Economic Development Canada released the national security guidelines for research partnerships. How do your institutions ensure that the researchers are aware of and compliant with these guidelines?

● (1655)

**Dr. Chad Gaffield:** They have all now created research security offices or branches within their operations. They're undertaking public awareness discussions and town halls on their campuses. Literature has been sent out and so on.

This guide has really tried to help bring together, in many ways, and to help, as my colleague Philip was saying, particularly across our 97 institutions. This was developed for everybody. I think getting the word out and ensuring that we all can de-risk rather than simply decouple what we're doing internationally is the objective. We're pursuing it with, I think, considerable success.

We've heard lots of discussion here at the committee about attempts to interfere with research or individual researchers and various strategies and so on. We are very aware of that. We're very pleased that, thus far, we've been able to manage that successfully. It's been partly through the information sharing and the consciousness raising and so on.

**Ms. Valerie Bradford:** Great.

I know that U15 Canada is also working toward developing a "secure scholar" digital tool to support researchers and institutions in fulfilling security requirements. Can you elaborate on that how that works?

**Dr. Chad Gaffield:** Yes. It's a really important point. Thank you for asking that.

We were concerned that some of the digital tools available for managing research security are created outside Canada in databases and so on. We felt that there really should be a made-in-Canada option for underpinning a lot of our risk management on our campuses. We took the initiative to start building Securescholar.ca with contributions from our members across Canada. A beta version of that will be available shortly. Our hope is that we'll thereby have a made-in-Canada digital tool that will really help and support the risk management on our campuses with respect to research security.

**Ms. Valerie Bradford:** Okay.

My last question is for you, Mr. Landon. What steps does your institution, like other post-secondary institutions, take to ensure research security with international partners? What steps do they take to ensure that?

**Mr. Philip Landon:** My institution represents the 97 universities. Those universities do apply the national security guidelines, as Mr. Gaffield was referring to. They do their due diligence on all international collaborations in this changing environment. It has become tighter over time. Those guidelines have been very helpful tools for them.

**Ms. Valerie Bradford:** Thank you.

I'll turn it over to you, John.

**Hon. John McKay (Scarborough—Guildwood, Lib.):** Thank you, colleague.

I want to direct my question to Mr. Stoff.

We just heard Dr. Gaffield talk about de-risking versus decoupling. Do you think that there is any system, any app, any education, that can actually drive the risk of intellectual theft, primarily, down to such a level that we can have confidence that it's not leaking out to what is our main geopolitical risk, namely China?

**Mr. Jeffrey Stoff:** Thank you.

If your question is in terms of a technical capability, then no, I'm not aware of anything out there and I would be pessimistic that there would be such a kind of magical tool that can do that given the sophistication of the way China operates, the way it obfuscates its activities, and the way it integrates and attempts to influence and divert knowledge transfers in ways that are opaque. A lot of that takes a lot more digging and nuance, and I don't know of a tool that's going to solve that.

**Hon. John McKay:** I had the good fortune to be in Taiwan last May and of course their threat environment is significantly different from ours, but I didn't get the impression that they were worried about their research leaking out to China because they were acutely aware of the way in which the Chinese government had tried to insinuate itself into Taiwanese society. They were constantly concerned about dual use. Even research that appears to be benign or for a non-military or non-security aspect, in fact, can be turned against the best interests of the host nation.

In light of the testimony given by Mr. Landon and Dr. Gaffield, do you believe—

• (1700)

**The Chair:** I'm sorry. We're out of time, but if there is a comment coming back to us, if we could have that in writing, it would be helpful. I think we know where you were going with that.

Now we'll go over to Maxime Blanchette-Joncas for six minutes.

[*Translation*]

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

I welcome the witnesses who are joining us for this study.

Mr. Landon, you're joining us for the first time. I'd like to welcome you. I also want to congratulate you on your new mandate. You've been in office for almost three months now. I wanted us to set the stage: it's not every day that we receive the president of Universities Canada, which represents 97 universities in Canada.

Since the beginning of your mandate, have you been able to meet with the Minister of Innovation, Science and Industry to share any concerns about research?

**Mr. Philip Landon:** I have not met Minister Champagne personally, but the university presidents met with him once.

**Mr. Maxime Blanchette-Joncas:** All right, thank you.

As Universities Canada's interim representative for the past three months, have you been able to have a meeting with government people to share concerns about scientific research in Canada?

**Mr. Philip Landon:** Yes, of course.

**Mr. Maxime Blanchette-Joncas:** With whom did you meet?

**Mr. Philip Landon:** I met with the universities working group, which Mr. Gaffield was talking about.

**Mr. Maxime Blanchette-Joncas:** I'm talking about members of the government. Have you met any ministers, MPs or other parliamentarians?

**Mr. Philip Landon:** I have occasionally met MPs and other parliamentarians, yes.

**Mr. Maxime Blanchette-Joncas:** Very well, we're glad to know that. However, I take it you haven't met the minister yet.

**Mr. Philip Landon:** No.

**Mr. Maxime Blanchette-Joncas:** That's fine. Let me reassure you, we've been waiting six months for him too. Please be patient, we hope you'll be able to meet him. If you see him, give him our greetings and tell him that the House of Commons Standing Committee on Science and Research unanimously passed a motion six months ago asking him to come and give evidence to explain why the government has not made any additional investment in research. If you could pass this message on to him, it would be greatly appreciated.

Let's get back to the subject at hand today.

Mr. Gaffield, it's a pleasure to have you back with us. We're always grateful for your statements and presence. Overall, what are your members' concerns, priorities and demands regarding the national security of research and the topic before us today?

**Dr. Chad Gaffield:** Thank you very much for your question, which goes to the heart of the issue we're discussing today.

The current reality is that every country must have a national capability. We've learned that this is essential. Not so long ago, we used to talk about globalization and a world with networks and transfers, but now we see that, in fact, geopolitical borders count for a lot. There's a lot of competition between countries and, unfortunately, there will be winners and losers. It's more and more obvious.

Today, there's no doubt that the best way to move a country forward is through science and research. You can see it everywhere, especially in the world's major countries, which are investing heavily in this area. That's why I'm so afraid for Canada. You have to understand that it's a bit like a garden: to go further, you have to cultivate it all the time. And why is that? Because there's competition between countries, and to carve out a solid, stable place in the world, Canada has to attract and retain talent, and rely on the talent of its people. That takes investment, and I think that's the key. If we don't have the ability to defend ourselves in a context where other countries are threatening us, we will be more fragile, obviously.

• (1705)

**Mr. Maxime Blanchette-Joncas:** Thank you.

Indeed, as you mentioned, we need to cultivate the garden. I think you'll agree that flowers aren't growing very well in the garden at the moment. We are the only G7 country to have reduced its investment in R&D over the last 20 years. We spend 1.8% of our gross domestic product on R&D, compared with 3.4% in the United States. I think the message is pretty clear.

If I understand what you're saying, the fact that the federal government doesn't invest enough in R&D compromises research national security, because researchers are tempted to do business with people from abroad, who don't always have our interests at heart. I'd like to hear your views on this.

Mr. Landon, I'll invite you to add your comments afterwards.

**Dr. Chad Gaffield:** In my opinion, the key element is a certain cooling of enthusiasm. If we decide not to touch certain areas of research that are based on international partnerships, it's going to backfire on Canada. There are very important areas of research where we need to be more involved, not less. If we don't rely on

partnerships with other countries, especially those that are increasingly threatening us, we need to dive deeper into these areas of research, not pull back.

**Mr. Maxime Blanchette-Joncas:** Mr. Landon, I'll give you the—

[English]

**The Chair:** That's great. Thank you very much.

We will now go to Mr. Cannings for six minutes.

Congratulations again on getting your bill through the House this afternoon.

**Mr. Richard Cannings (South Okanagan—West Kootenay, NDP):** Thank you very much. It made my day.

I'd like to thank all of the witnesses for being here today. It continues to be an interesting study.

I'm going to start with Mr. Landon. You had a series of points in your presentation. You talked about the cost of cutting ties with researchers abroad and the stagnation of research funds here, and then you mentioned what a couple of other countries are doing. Australia has developed its list regarding restrictions.

Our big competitor, if you will, is the United States. You mentioned CHIPS, which has this combination of restrictions and very significant investments.

I'm wondering if you can comment on whether that's where we can go in Canada. In Canada, we have difficulty outspending the United States or China, but we could at least provide enough funding for research, I think, to keep our researchers here at home and make it domestic research, without having to carry on these partnerships and agreements with foreign entities—especially with China, for the reasons we all know.

Can you comment on that? What should be the best tactic for Canada?

**Mr. Philip Landon:** I think absolutely we need to increase the funding that is available to Canadian researchers. I don't believe we need to reduce the international collaborations researchers undertake in Canada. Research is an international enterprise, and I think it's very important we maintain the advantage Canada's had in international research over the preceding years. I think it's a very important advantage to Canada. That being said, our universities and our researchers are aware of security threats and are taking steps accordingly, as I and Mr. Gaffield have outlined in our remarks. There's no way we can outspend the United States, but we could make sure our percentage is moved up to OECD levels, because it's falling behind them right now.

• (1710)

**Mr. Richard Cannings:** The restrictions you see put into CHIPS or the list Australia is producing I assume would be a good place to start for Canada when its building lists. I understand those lists are being put together now. Those other lists from other countries, I assume they'd be just as appropriate here as they would be for our friends in Australia and the United States.

**Mr. Philip Landon:** I believe that the university working group and the folks at the government who are putting those lists together are looking at international comparators and making their lists—which are not public yet—with those in mind. My assumption would be, yes, that's the case.

**Mr. Richard Cannings:** I'd like to turn to Dr. Gaffield with comments on this same thing. You said investments elsewhere put pressure on Canadian universities. Could you comment further on that and what Canada needs to be doing right now to stem that tide?

**Dr. Chad Gaffield:** For me, a really top priority is what we call the highly qualified talent. We know that much of the best research, and in fact, how our companies innovate and so on, really depends on the emerging generation. It depends on those who are now completing their graduate degrees, post-docs and so on. What we need to be able to do internationally is to make sure studying here, undertaking research here and pursuing careers here across all sectors is financially viable. One of the issues—and you've heard a lot about this—is that it's a huge domestic risk for us if we do not take this very seriously.

You've heard me say before right now we're 26th in the OECD rankings of 37 countries in terms of the proportion of our population with graduate degrees, which I don't think is the profile of a country that's really going to thrive in the 21st century. We need to really take very seriously this question of the highly qualified talent we need across sectors in terms of innovating our society, our culture and so on and really building the kind of high-value economy society, which is really the only kind that's going to succeed in the 21st century.

**Mr. Richard Cannings:** If you were talking to a researcher in a university in Canada who is struggling to find enough funding for their research or struggling to find a student who has research funding attached to them, because the researcher may not, and China's an obvious solution to that for some researchers, then it could help that if we funded our students properly, if we funded our researchers.

**Dr. Chad Gaffield:** My sense is that it's really at the heart of this whole issue.

Thank you.

**Mr. Richard Cannings:** Thank you.

**The Chair:** Thank you.

On our second round, we'll start off with Ben Lobb for five minutes, please.

**Mr. Ben Lobb (Huron—Bruce, CPC):** That's great. Thanks very much.

I appreciate the discussion we've been having today and over the last number of meetings.

The first question I would have is whether we have gotten to the bottom of all of this. Do you feel we've gotten to the bottom of all of this amongst our universities? Have they had a chance in the last few months to take a look at all the issues and decide?

Go ahead, Mr. Gaffield.

**Dr. Chad Gaffield:** I feel very strongly that five years ago, in 2018, we began taking this really seriously. Believe me, it was not obvious internationally how one moves from open science to “open as possible, secure as necessary”. That has been the journey we have been on for the last five years.

My sense, at least, is that we've made huge progress, such that I think all of us today can feel very confident that our research on our campuses is being undertaken in secure ways that do not threaten us.

However, as I've been saying, this is an evergreen, ongoing and constant issue. As we've heard from various witnesses, with the tactics used by other countries to affect us and so on, with the kinds of strategies that are going to evolve, we have to be constantly attentive and alert and update this on an evergreen basis.

• (1715)

**Mr. Ben Lobb:** I respect that answer, but I look at it from my point of view.

You tell me that and I believe you, but then how would we verify this? What are we using to say...? If we say that this was the problem and here are the articles in *The Globe and Mail* and from around the world, and then we and all the universities come here—you're part of the representation—how do we say here's the proof that we've actually done this? Is there any?

**Dr. Chad Gaffield:** That's such a great question.

In fact, earlier in this discussion I appreciated the emphasis on enforcement. From my point of view, if you have policies but there's no enforcement, it's not going to work. We have to really take seriously the monitoring, the verification and so on. We are wrapping up research security within the responsible conduct of research because, within that framework, there is ongoing auditing. There's ongoing verification on a continual basis. I think that's what's going to be needed in this.

**Mr. Ben Lobb:** Out of the universities you represent, for example, is there a number? Have universities said to you that there has been probably 20 cases in the last couple of years where they've probably crossed the line? Has anybody from the universities that you represent come up to you and told you that, or is there no number and we just have to assume that everybody has done it?

Is there a number?

**Dr. Chad Gaffield:** My sense is that we've been managing this really successfully. We hear about potential threats and about attempts to influence and so on, and we take them very seriously.

I think we can be proud. As I said, in Canada we can be proud that so far our measures and so on are working.

**Mr. Ben Lobb:** One thing I can remember from a while ago is that a few representatives said that, if the public safety department doesn't come in and tell them, it's very hard for them to truly know. I think that's a statement.

Is that now ongoing? Is that implemented at, say, the 15 universities you represent? Are public safety officials and all the hierarchy there coming into the universities and saying that you've submitted a list, you've checked them all off and you're good now? Is that mechanism in place now?

**Dr. Chad Gaffield:** You're touching on what I think is the key way in which we've been functioning and on the shared responsibility. The national intelligence services obviously have great capacity that we don't have on our campuses. We depend on that. They have now—

**Mr. Ben Lobb:** Do the University of Waterloo or the University of Toronto, for example, now submit a list of proposed projects to the public safety department, and then they go through and vet them? Is that a system that's in place today?

**Dr. Chad Gaffield:** The guidelines call for a screening through the granting agencies. Ones that are deemed by the agencies to merit further investigation go to the public safety department. Then there's that confidential examination.

**Mr. Ben Lobb:** I have just one last quick question.

We've mentioned the PRC. Is there any other foreign organization this committee should be concerned about that may be going down the same path that the PRC has?

**The Chair:** Answer really briefly.

**Dr. Chad Gaffield:** Our approach is that no country, company or partner gets a free pass. Our research security policies and practices are designed for everyone. Obviously, our attention—

**The Chair:** Thank you. That's great. I'll have to cut it there. We're on a tight schedule if we're going to get through it. I appreciate that.

I have Mr. Turnbull for five minutes, please.

**Mr. Ryan Turnbull (Whitby, Lib.):** Thanks, Chair.

Thanks for the discussion. Thanks to the witnesses for being here today.

Mr. Stoff, I'll start with you.

We heard Mr. Gaffield say earlier that Canada's research security is “among the best in the world”. You are quoted in the Toronto Star not so long ago as saying, “Politicians in the U.S. are starting to have these conversations, but Canada can rightfully say they're leading the way”.

Mr. Stoff, can you tell us why you would say that?

**Mr. Jeffrey Stoff:** This was based on the policies I read about the federal funding agencies in Canada deploying specific restrictions moving forward—saying we're going to have certain blanket bans and deny funding if there's collaboration with high-risk candidates. It was based on that.

The U.S. government has not done that as explicitly. They are leaving too much to the individual institutions to figure out.

• (1720)

**Mr. Ryan Turnbull:** If I'm not mistaken, you made those comments with regard to the entity list and the blanket ban on specific entities that would be coming forward. Is that right?

**Mr. Philip Landon:** Yes.

**Mr. Ryan Turnbull:** Okay.

I understand that other countries have produced national security guidelines, just as Canada has this year, in 2023, which we heard about today.

I want to ask Mr. Landon about a jurisdictional issue.

My understanding is that a lot of provincial governments have cut back some of the core funding for universities across Canada, which means they're more reliant on international student fees and research funding to essentially stay afloat. Would you say that's true?

**Mr. Philip Landon:** That's a good question.

I would say that the amount of funding from provincial governments has decreased over the years, and universities have been making that up through international students to a certain extent. However, the research piece has been separate. The research funding does not go into the core budgets. It's focused on research and research offices.

**Mr. Ryan Turnbull:** In terms of the federal jurisdiction, it's around the tri-councils and research funding. This is the lever the federal government has around research security. What roles do the provinces play in the shared responsibility framework you both talked about?

Mr. Landon, I'll go first to you, and then Mr. Gaffield.

**Mr. Philip Landon:** My understanding is that the provinces will potentially develop their own frameworks based on the federal framework. However, they are not themselves directly involved in the framework.

Mr. Gaffield may have a better understanding.

**Dr. Chad Gaffield:** The history of Canada demonstrates that federal leadership is absolutely essential in terms of signals that we're going to build a better country with respect to research and innovation. We all have to look to the federal government's leadership on this. That's how we went from being an intellectual colony as late as the 1950s and 1960s to moving onto the world stage. That was through federal leadership.

I think the provinces are looking for signals from the federal government about the importance of this. I would say that the more signals.... If the government can say, “This is a national priority for our country”, I think we can hope for better funding at the provincial level.

**Mr. Ryan Turnbull:** Do you think the federal government is sending some of those signals?

**Dr. Chad Gaffield:** I think the last few years have been unsettling for us in terms of the kind of cultivation of the garden we need, particularly in this context, where we're not trying to maintain.... We shouldn't be just trying to maintain. We need to have real ambition. That's what will be called for in order for us to keep a place in this turbulent 21st century.

**Mr. Ryan Turnbull:** Thank you, Mr. Gaffield.

In terms of defining sensitive research areas.... I know this goes to earlier questions about alternative or dual uses for research. I think some of that becomes challenging.

How do we balance that out, when we can identify areas? There is a lot of documentation on specific areas that would be sensitive research. When you're considering alternative or dual use, how do we balance this out? There's a natural tension in this work, I believe.

**Dr. Chad Gaffield:** It's very complicated.

All technology can be used for good or bad. We know that. Our challenge is to administer this in a way that's not going to undermine research in the areas Canada really needs. That's why research security work is complex and needs to be very sophisticated. It's in order to not ruin entire fields of research that are so important for Canada's future.

**The Chair:** Thank you.

With five minutes left, we have two and a half minutes for the NDP and the Bloc.

[*Translation*]

Mr. Blanchette-Joncas, the floor is yours.

**Mr. Maxime Blanchette-Joncas:** Thank you, Mr. Chair. You meant the Bloc, then the NDP.

I'm going to build on what Mr. Gaffield said about the importance of federal government leadership.

Last February, the federal government said that grant applications for research carried out in partnership with an institution representing a risk to national security would henceforth be refused. Last May, in an article in the *Journal de Montréal*, the Quebec government's Minister of Higher Education, Pascale Déry, said she was awaiting "clear directives" from the federal government, and declared, "I myself made representations to Minister Champagne. I haven't had an answer on that score, and I'm still waiting for one." Cabinet then said it was in the process of drawing up a list of risky foreign research institutions. So it's been almost a year since it was announced that there would be no funding, but there's still no clarification.

Mr. Landon, I'd like you to clarify something for us. You represent the 97 universities in Canada. What do you expect from the federal government regarding the missing guidelines for national security in relation to research?

• (1725)

**Mr. Philip Landon:** In my opinion, the new list will be published soon. It will be useful for our community, as it will let it know how to move forward.

**Mr. Maxime Blanchette-Joncas:** All right.

Mr. Gaffield, in February, the federal government made an announcement to counter espionage. We were told they'd be back with a list. Today is September 27. Have you seen this list?

[*English*]

**Dr. Chad Gaffield:** No.

[*Translation*]

**Mr. Maxime Blanchette-Joncas:** All right.

I'm going to continue, because this is a very important topic.

Mr. Stoff, you talked about your vision for the Center for Research Security and Integrity during your June 9, 2022, appearance before the U.S.-China Economic and Security Review Commission. You also spoke of a new paradigm—a new approach to research protection. Can you tell us how this approach differs from the current one? What are the advantages of this approach?

[*English*]

**Mr. Jeffrey Stoff:** Yes, I think there is just as great an effort being made by the Canadian government as by other governments. There is a lack of knowledge—subject matter expertise in language—to really build the comprehensive knowledge that's needed, particularly on China. To rely entirely on governments to do this is not going to work.

**The Chair:** Thank you. If there's more, we can ask for it in writing.

We only have two and a half minutes, and I'm going to go over to Mr. Cannings, if I can.

[*Translation*]

**Mr. Maxime Blanchette-Joncas:** Mr. Chair, I would like us to ask Mr. Stoff to answer my question in writing.

[*English*]

**The Chair:** Yes, I just said that. Thank you.

Mr. Cannings, it's over to you for two and a half minutes, please.

**Mr. Richard Cannings:** Thank you.

I want to pick up on this issue of trying to balance research freedom and good international partnerships with these necessary restrictions in some situations, and we have this talk of lists.

I want to go to Mr. Landon to ask what the stick is behind these lists. Is it that you won't get funding from the tri-councils if you have these connections? Is there anything that may drive certain researchers away from Canadian funding and directly into the hands of China? Is there also some push-back on universities and their ability to obtain funds from the tri-councils behind that? I wonder what the mechanism would be there.

**Mr. Philip Landon:** Our understanding is that, when the restricted entities list—or I think it's the named organization list—and the sensitive research in technology area list merge, federal funding would not be made available to researchers who are applying for that.

I think the details on how current partnerships with those working in those areas would have to wind down are still to be determined, but that's our understanding as to how the lists are going to be applied.

**Mr. Richard Cannings:** Mr. Gaffield, can you comment on that? What your hopes and concerns are with regard to that situation?

**Dr. Chad Gaffield:** As soon as the lists come out, I am convinced that all our universities will, as quickly as possible, take any action that is necessary in terms of respecting those lists.

**Mr. Richard Cannings:** Are you not concerned about any implications that might have for researchers who are then denied funding from Canada and who go elsewhere?

**Dr. Chad Gaffield:** Absolutely. As I said earlier, this is going to put at risk potentially some of our students, who are obviously a key aspect of our projects.

It seems to me that it's in all our interests to maintain and treat as a top priority the fact that research be as open as possible but as secure as necessary. We take this very seriously, and I'm sure all our institutions will do gymnastics to support their students as much as they can, but obviously the federal government has to help as well.

• (1730)

**The Chair:** Thank you very much.

Thank you to all three witnesses today, Mr. Stoff, Mr. Landon and Mr. Gaffield, for your testimony and your answers.

Thank you to the members for your questions.

I know we did have to cut off a few. If there are some additional comments that we could have in writing or any clarifications that you'd like to provide, please send them to the clerk.

We will now briefly suspend to let our witnesses leave and get our second panel of witnesses. We have two witnesses who will be dialing in and getting tested, and then we'll be back in just a few minutes for our second panel.

• (1730)

(Pause)

• (1735)

**The Chair:** Welcome back. We'll get started with our second panel now that we have our tests completed.

Pursuant to Standing Order 108(3)(i) and the motion adopted by the committee on Monday, December 5, 2022, the committee commences its study of the long-term impacts of pay gaps experienced by different genders and equity-seeking groups among faculty at Canadian universities.

It's now my pleasure to welcome our two witnesses who are joining us virtually. First, we have, as an individual, Catherine Beaudry, professor, École Polytechnique de Montréal. We also have, from

the Canadian Association of University Teachers, Robin Whitaker, vice-president, who is joining us from Laurier, I understand.

You each have five minutes.

If we could get started with Dr. Beaudry, that would be terrific.

[*Translation*]

**Dr. Catherine Beaudry (Professor, Polytechnique de Montréal, As an Individual):** Thank you. I'll be making my statement in French.

Thank you for this invitation to appear before the Standing Committee on Science and Research. It is a great privilege for me to have the chance to share with you my research findings on wage inequality.

As a specialist in the management and economics of science, technology and innovation, I quickly became interested in the differences between men and women in science. I wanted to go beyond simple gender average comparisons, which always show women lagging behind men, to understand the factors that influence these gaps. I therefore examined how gender, age, funding, collaboration and position in networks influence scientific output and impact.

My research has shown that, for the same amount of grant funding obtained, women publish more than men. On the other hand, when men and women publish in scholarly journals with the same impact factor, the greater the proportion of women co-authors, the less likely the article is to be cited. These results prompted me to investigate whether these differences in scientific output had an impact on the career progression and salary of female academics.

Also, as I was treasurer, then vice-president, of the Association des professeurs de l'École Polytechnique, I was also called upon to find ways to reduce the barriers faced by female professors, which slow down their careers and keep salaries below expectations. I'm happy to tell you that there is now retroactive promotion at Polytechnique so as not to penalize women who take maternity leave, for example.

The main part of my talk is about survey results. In 2017, I conducted an extensive pan-Canadian survey of academic salaries and explored all the bonuses and professional fees that are added to base salary and exacerbate gender pay differences in overall compensation. The study looked at market and performance bonuses, bonuses associated with research chairs, and administrative bonuses.

Both Statistics Canada's descriptive statistics and those from my survey show that men earn more than women, and that the gap widens as one progresses in one's career from assistant professor to full professor. There are fewer and fewer women at full professor level.

Survey data show that when it comes to administrative bonuses, men earn \$16,000 compared to \$9,000 for women. On the market bonus side, men earn \$13,000 compared to \$7,000 for women. The biggest gap is in professional fees: \$25,000 for men and \$13,000 for women.

While the gap between men and women at the rank of full professor is \$7,000 if we consider just base salary, it rises to over \$15,000 if we consider total compensation. So it's when it comes to total compensation that the gap is widest.

We also ran regression models to try and understand the pay gaps we were able to explain and those that might be judged to be a bit of discrimination. We showed that several factors explain the differences in overall compensation, which vary from 4% to 6% depending on the field. On average, it's not that huge.

Age, academic rank, discipline, career breaks, a more research-oriented career, but, above all, the various bonuses and professional fees explain the differences in overall remuneration between men and women. Once all these factors are taken into account, there are very few gender gaps that could be considered as discrimination and are not explained by all the variables we have included in the regression model. Only fees and administrative bonuses fall into this unexplained category.

For all elements of total compensation embedded in a collective bargaining agreement—for universities that have such agreements—such as the base salary associated with different academic ranks and certain bonuses associated with research chairs and performance, gender pay gaps are explicable. We do, however, have difficulty explaining the amount of bonuses.

• (1740)

We're starting to study this.

Since the chair is signalling that my time is up, I thank you. I can answer your questions in both French and English.

[*English*]

**The Chair:** I'm afraid I had to cut you off there, but thank you. Of course, you may be able to work some of what you didn't get to into your answers. If not, you are welcome to provide it in writing. That would be wonderful. Thank you.

Now we go to Dr. Whitaker from the Canadian Association of University Teachers for five minutes.

**Ms. Robin Whitaker (Vice-President, Canadian Association of University Teachers):** Thank you, Chair.

I join you from St. John's at Memorial University—not Laurier—on the island portion of Newfoundland and Labrador, which I will begin by acknowledging as the unceded homelands of the Beothuk and Mi'kmaq peoples.

I am vice-president of the Canadian Association of University Teachers, which represents over 72,000 teachers, researchers, librarians and general staff at universities, colleges and polytechnics across the country. I'm also a professor at Memorial University, which recently completed a gender pay gap study that identified and compensated women, including me, for salary inequalities.

Thank you to the committee for undertaking this important study. I want to make four main points in my opening remarks, and I'll be glad to elaborate more in the questions and answers.

First, to better understand the diverse and intersecting factors that contribute to pay inequities in universities and colleges, we need more robust demographic and compensation data from institutions for both full-time and contract academic staff. The federal government can offer leadership by supporting the collection of this data through the expansion of Statistics Canada's university and college academic staff system survey, or UCASS, as a start.

Second, thanks to UCASS, we have fairly robust data on the gender pay gap for full-time university professors. The raw pay gap does not account for differences in observable characteristics, but it is a first step in understanding pay differences between subpopulations.

For women professors working full-time in Canadian universities, that raw gap is 10% less on average than their male counterparts. This gap is driven largely by differences of discipline, rank and age. Even after adjusting for these factors, however, we still find a gender pay gap of about 4%, and this remaining gap is most likely explained by the kinds of factors that my colleague mentioned, like starting salaries—which are often negotiated individually—by merit pay and market differential awards, and by differences in time to promotion.

Each of these factors is an opportunity for bias that can result in differential compensation. In short, we need a broader analysis and reform of the salary structure in academia.

In lieu of institutional data on salaries tied to factors beyond binary gender, we have looked at census data for university professors and college instructors. This data should be read with some caution, but we find that the raw pay gap for racialized and indigenous post-secondary teachers is wide, and it's even wider for racialized and indigenous women. It's 10% for racialized university teachers, rising to 25% for racialized women university teachers.

Employment status is a likely factor in the large pay gaps seen in the census data, as equity-deserving group members are most likely under-represented in the highest ranks and in full-time academic work.

Thirdly, universities and colleges need to look at equity hiring in disciplines traditionally dominated by men and at conducting routine pay equity exercises. Academic staff associations have been actively working to bring about these changes in collective agreements. They've also been negotiating contract language around the provision of information and compression of salary scales, and "stop the tenure clock" language to help women accelerate their time to promotion.

My fourth and final point is that the federal government has a key role to play in supporting academic staff associations to eliminate pay discrimination in the academic workforce. It can support the collection of broader demographic data in the UCASS salary survey, including on race, gender identity, disability and indigeneity, and do so for all staff—full-time and part-time.

Doing so will help identify and assess how single, dual or multiple sources of disadvantage combine to affect salaries and other forms of compensation. It can also support efforts to eliminate discrimination through a strengthened federal contractors program, requiring compliance with federal employment equity, pay transparency and pay equity requirements.

Lastly, the federal government can work with the provinces to renew the academic workforce and create more full-time tenured positions. Current labour force survey estimates show that one in three university professors is on part-time or part-year contracts without fair compensation, including access to benefits, pensions, professional development or research funds. The lack of faculty renewal is a structural barrier to achieving employment equity and, therefore, pay equity among academic staff.

Thank you. I look forward to the discussion.

• (1745)

**The Chair:** That's great. Thank you.

Now we'll get going with our first round of questions, starting with Corey Tochor for six minutes, please.

**Mr. Corey Tochor (Saskatoon—University, CPC):** Thank you so much.

Dr. Beaudry, you talked about how you're not penalizing mat leave. How does that work? What are the nuts and bolts of that?

How do you set up a program so that, when someone takes time off to have a child, it doesn't affect the pay gap?

**Dr. Catherine Beaudry:** I must mention that this is not something that is new in Quebec. Université Laval had this in 1986, so they were the precursors.

What happens is that, when a woman comes back to work after maternity leave, eventually asks for a promotion to the next rank and obtains that rank, the promotion is granted retroactively to compensate for the maternity leave. If she took a one-year maternity leave, she would be granted the promotion at the start of the maternity leave, not at the end of the maternity leave, and she would receive compensation for the year she lost in terms of the salary increase. This is because, when you move from assistant to associate professor, there's an increase in salary.

She would have the retroactive pay of that year she was on maternity leave when she finally applies for the promotion. That's what I mean by retroactive. The maternity leave is not penalized.

**Mr. Corey Tochor:** It was back in 1986 that this was introduced. Was this to fix some of the problems at the time? When it was introduced, was the hope that this would narrow that gap much more than it has been narrowed?

**Dr. Catherine Beaudry:** I presume so. I was quite young in 1986, so I couldn't tell you exactly what was in the mind of the rector of Université Laval at the time. I suspect it was to remove the penalties that women encountered by taking maternity leave.

**Mr. Corey Tochor:** I'm moving on to another aspect. In an article you co-wrote this spring, you established that, on average, women publish 1.8 articles per year, compared with men's 2.6 articles.

What are the numbers in Canada, and how do they stack up to the rest of the world?

• (1750)

**Dr. Catherine Beaudry:** I couldn't tell you about the rest of the world in terms of publications, but if you read any publication by Vincent Larivière, I'm sure you will find that women publish less than men.

I think it's a question of choice. This is something that nobody has really had a look at. Many women will take the decision to not write another paper over the weekend because they want to be driving to ski lessons or swimming lessons. I think the question of choice is something that we don't have on our radar. Everywhere in the world, women publish less than men.

**Mr. Corey Tochor:** I would be interested in that. If you could find that number afterward to include in a written submission, it would be interesting to see how we stack up.

Another area that you've expressed concern about is how Canadian nanotechnology research is very male-dominated. What are other specific research areas in Canada that have the same issues?

**Dr. Catherine Beaudry:** You could probably count most of engineering and physics, which are the last bastions where women are not dominating in the academic fields. This is because you have more female graduates in most other disciplines, compared to engineering and physics.

**Mr. Corey Tochor:** Thank you so much for that.

Switching gears a bit and going to your colleague.... Thank you again for appearing and for your testimony.

I understand that you were the president of the university faculty association. You've engaged in contract negotiations with the university administration. I note that pay and gender equity were some of your primary focuses during the negotiations in 2019.

In your view, are university administrations open to gender equality concerns?

**Ms. Robin Whitaker:** You're asking me about my own institution. Is that correct?

**Mr. Corey Tochor:** Just in general, are university administrations open to gender equality concerns? I'm assuming they would be.

**Ms. Robin Whitaker:** Yes, certainly I think that's right. There is increasing openness. However, as we've seen from Catherine's testimony, there are still multiple points at which bias can creep into the process.

Were you referring to Memorial University and the negotiations that resulted in a gender pay gaps study? Is that what you were asking me about, or is this a more general question?

**Mr. Corey Tochor:** It's just in general. I'm trying to understand your role. Thank you for the work you do for the public service—on all aspects but especially on narrowing that gap, hopefully.

If this was identified by you in 2019, it's now been four years. If the university administrations are open to addressing this, I just want to know how the four years have gone. How much of that gap do you think we've closed, in your experience?

**The Chair:** We are over the time. Could you submit that writing? It sounds as though there might be some detail you can dig up from your work, which would be helpful for our committee.

We go over to Lena Metlege Diab for six minutes, please.

[*Translation*]

**Ms. Lena Metlege Diab (Halifax West, Lib.):** Thank you very much, Mr. Chair.

Ms. Beaudry, we know that the pandemic has had a very significant impact on women in the workplace, particularly on mothers of school-age children. Can you tell us more about the effect of the pandemic on the university wage gap, according to your research?

You mentioned 2017, but do you have any post-pandemic data?

**Dr. Catherine Beaudry:** As part of our studies, we looked at the impact of scientific publication on salaries, and noticed that, quite often, a more research-oriented career, resulting in greater scientific output, has an impact on salary. During the pandemic, women published less, but men published more, because women took on a lot of child care during the school years. I myself did some home-schooling with two of my children, which took up a huge amount of my time, on top of all the tasks associated with my professorial role, which took up more time.

So I expect that this gender gap in publishing that we've seen in 2020 and 2021 will have an impact, but it's hard to measure right now, because we're waiting for the upcoming promotions to have enough data to know the exact gap. It's certainly something we'll see in the Statistics Canada data.

On the other hand, I reiterate what my colleague was suggesting. It's going to take a lot more data in these surveys to fully understand the phenomenon, and this data will have to be systematically matched with data relating to funding, articles and citations, for example. In fact, we need to document the professorial career, be-

cause for a researcher like me, who spends a lot of time studying and matching this data to make sure that the John Smith of Memorial University is not the John Smith of the University of Toronto or the John Smith of the University of British Columbia who has changed institutions, it becomes very complex to measure.

• (1755)

**Ms. Lena Metlege Diab:** I'm also very curious to know if you think that one of the reasons why women publish less is that they take on administrative roles in universities more often than men.

**Dr. Catherine Beaudry:** In our study, we separated administrative positions such as rector or department director from other administrative positions such as laboratory director or bachelor's or master's program manager. When it came to less prestigious administrative positions, women were systematically paid less than men, in terms of administrative bonuses.

**Ms. Lena Metlege Diab:** Thank you.

[*English*]

Madam Whitaker, I have a question for you. I know that you're here representing the Canadian Association of University Teachers, but you're also from Memorial—from Newfoundland—and I'm an Atlantic Canadian as well.

My question for you is this: In the research you have and in the information you've come up with, do you find any differences between the smaller universities as opposed to the larger universities? Is there anything that you could share with us on that—or even the colleges?

**Ms. Robin Whitaker:** That's a great question.

Clearly, institutions and provinces have a major role to play in addressing pay inequities. We don't have institutional data at such a fine-grain level. I would hesitate to generalize in that sense. I think that, given the nature of this committee, what we can point to is some of the work that the federal government can do to support institutions, faculty associations and unions that are trying to work on this issue—such as the kinds of things that I pointed to in my opening statement, where the federal government can help with improved data that's fundamental to undertaking the kinds of studies that lay the groundwork for correcting inequities.

Certainly, as you know from our regional challenges, there's been a lack of renewal of full-time, full-year or tenure-stream faculty, in large part because of decreases in the public funding that's available. The federal government certainly has a strong role to play there, working with the provinces and institutions to expand those opportunities, especially for early-career researchers. Federal funding to granting agencies is also vital. This is a time to open the glass door that's been—

**Ms. Lena Metlege Diab:** Thank you for talking about the early-career researchers. That was going to be my question. I'm glad you got it in, because I'm getting the signal from the chair.

Thanks very much.

**The Chair:** Now we'll go to Monsieur Blanchette-Joncas for six minutes.

[Translation]

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

I welcome the two witnesses who are joining us for the second hour of the meeting.

Ms. Beaudry, I listened carefully to your speech. I've also analyzed the survey you conducted regarding the disparity between men's and women's incomes in academia. Earlier, you said that the most considerable gaps were in market bonuses and fee bonuses.

Tell me about the other factors. It says in your survey that age, number of children and taking a sabbatical don't necessarily have a significant effect. What do you think explains this?

• (1800)

**Dr. Catherine Beaudry:** In fact, it's not that they don't have a significant impact. It's that we are able to explain the pay gaps by age and number of children. To give you an idea, we measure the percentage attributable to age, which, according to some results, contributes to 5.48% of the gap. So we're able to explain a portion of the 4% to 6% gap between men and women by a difference in age between men and women.

We are able to explain, for example, the 0.27% difference due to administrative bonuses. We're able to explain the 0.56% difference based solely on whether or not we did the consultation for which we received professional fees. It's not that these factors don't have an impact. Rather, we're able to explain the wage gap by the differences between men and women for each of these variables.

I'd be happy to share the results of the regressions with your constituency office.

**Mr. Maxime Blanchette-Joncas:** That's good. Thank you very much for the clarification.

I'd like to hear your comments on a question I asked the final witnesses last week about data on the gender pay gap in Canadian universities. These data show that among Canada's 15 largest universities, those with the lowest gender pay gap were two Quebec universities, Université de Montréal and Université Laval. They were nevertheless significantly different, since the pay gap at the third university was three percentage points higher.

I'd like to know your point of view as a person living in Quebec. You're a Quebecker, and you work at a Quebec university. Why is it that Quebec's francophone universities have such a good record when it comes to pay equity between men and women on the faculty?

**Dr. Catherine Beaudry:** In Quebec, if I'm not mistaken, with the exception of McGill University and HEC Montréal, all universities have collective agreements, that is to say professors have a union. We haven't looked at it in detail, but where there is a collective agreement and a union, the gender gap is much smaller than in

universities where there isn't that kind of support, which contributes enormously to reducing those gaps.

It's also very rare for men to negotiate market premiums when they are recruited. When there is a collective agreement that allows this or that causes these market premiums to disappear over the years, they serve as a power of attraction for some professors. At Polytechnique, they wanted to get rid of all the premiums that existed and adopt a much more egalitarian approach. If you look at the rest of Canada, I think you have part of the answer in terms of who is unionized and who is not.

**Mr. Maxime Blanchette-Joncas:** That's very specific. Thank you very much.

I'd like to hear what you have to say about possible solutions. Based on your experience, what could the Government of Canada do to better support equity for university faculty members?

**Dr. Catherine Beaudry:** I've done a number of studies on the state of young scientists. We were talking earlier about the start of careers. Where the problem lies and where we really need to work very hard is with young women who are starting their careers and have children. That's where we're really lagging behind, because we are juggling family, children and the start of a career, writing grant applications and setting up courses. This is where we need to help women develop their scientific network, rather than disappear as I did. I didn't do any lectures from 1999 to 2006, because I was taking care of my four children. We really need to work on this, and perhaps have nannies who accompany women speakers who want to continue breastfeeding. You really have to be very creative.

When you look at men who have children, men who don't, and women who have had children and are further along in their careers, these three groups are very different from young women at the start of their careers who have children. That's where we're falling behind.

• (1805)

**Mr. Maxime Blanchette-Joncas:** Thank you very much.

[English]

**The Chair:** Thank you.

I must say that this testimony is very helpful. It's great to hear data and examples, and I know that our analysts will be busy trying to compile this work for us. Thank you for providing us with some great testimony.

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

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

I'm going to start with Dr. Whitaker from Memorial. I just have to say that I did my master's degree at Memorial, back in the 1970s, on birds, and it's nice to see the puffins behind you on the wall. Thank you for that.

You have brought up an issue a couple of times about the declining rate of universities in filling tenure-track positions, and filling them instead, I assume, with perhaps contract positions that focus more on teaching than on research. We heard testimony in an earlier meeting that, within that cohort or group of workers in universities—the people that are hired more for teaching—there is less of a pay gap, I presume because of how that is structured and funded.

I'm guessing that for those people who are hired in that manner, that group is dominated by women. Is that the case? Do you have data on that? Also, how is that related to this bigger story?

**Ms. Robin Whitaker:** Thanks. That's a really important question.

Yes, from what we can see, there is a greater tendency for both women and other equity-deserving groups to be located in the part-time or contract academic field. I think this is something that's crucial for us to address.

You said there is more equity, but it would be within that group. If we're looking at overall equity, the gap becomes larger and we start to see greater areas for concern if people don't have access to full-time, full-year jobs, which we often refer to as “tenure stream”. We also know that the number of precariously employed academics is increasing.

I think we should also be concerned about what might be a lost opportunity for some young scholars now to fully develop their potential as scholars if they're being increasingly streamed into jobs that allow them to perform only part of what they're trained for. I think this is where the federal government has a very important role to play, working with provinces, in stabilizing the funding to post-secondary education, particularly with a view to renewing the full-time faculty complement.

More than ever, we have what are often referred to as highly qualified personnel, but there's a diverse group of doctorates who are prepared to enter the academy but need the opportunity to get in there. That means creating those positions, allowing them to get in the door and providing research funding that will support them.

This is obviously also going to benefit us all. It will enrich Canada's capacity by diversifying the talent pool that's available. I think this is the moment to do it. We've seen this shift. It's keeping people out who are quite prepared to get in. I'm glad you asked the question.

• (1810)

**Mr. Richard Cannings:** Thank you.

I'll turn to Professor Beaudry now.

You talked several times about women not publishing as much, but I wanted to make sure that I heard you correctly. I think you said that for women who had the same grant funding as men, of those two groups, the group of women actually had to publish more.

It seems that not only did they tend not to have the time to publish because of all the other work that women take on outside of the job, but they had to publish more to get the same grant funding. Is that what I heard you say?

**Dr. Catherine Beaudry:** It's probably the opposite. Per dollar invested, they publish more. I would see it that way, as opposed to....

I'm an optimist.

**Mr. Richard Cannings:** Okay. I'm glad to hear the good side of it, but I heard it the other way. Women had to—and we hear this a lot—work harder to get “equality” with men.

**Dr. Catherine Beaudry:** I think it's something that we impose upon ourselves. Imposter syndrome is very much present. You think you ought to work harder to get your promotion and you feel you have to delay it until you're really, really good, whereas men will normally ask for a promotion whenever they feel they deserve it. There's a very big difference in the choice and what women decide to do.

They want to make sure that, when they apply for a promotion, they're going to get it for sure. It's a different strategy.

**Mr. Richard Cannings:** Quickly, about the situation in Quebec being better than in the rest of Canada, we heard some testimony in terms of.... That's what I thought I heard in terms of equality of pay.

Is part of that due to the availability of child care in Quebec and that history allowing women to work more?

**Dr. Catherine Beaudry:** Definitely.

**The Chair:** I'm sorry, Mr. Cannings. We're at the end of the time. We got a “definitely” under the wire.

Thank you, both, for getting those in.

Mr. Soroka, it's over to you for five minutes, please.

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

Thank you to the witnesses for coming today.

Professor Beaudry, I didn't hear.... In your study that you were doing, how many years did you go back? Is it from the 1980s, 1990s or 2000s? How far did you go back?

Are you finding a difference from when you first started? Let's say you went back as far as the 1980s or 1990s, and now you're into the 2000s. Is the pay gap better, the same or worse?

**Dr. Catherine Beaudry:** I didn't do a retrospective study in terms of pay gaps. I've done some retrospective studies on publishing and grants, but not on the pay gap. It was the 2017 data. I don't have the history.

**Mr. Gerald Soroka:** Okay. That's fair enough. I was just wondering if it was. That's what I was asking for.

You also mentioned that women are dominating research in certain areas. In those areas where they're dominating, are they paid the same as men, better or worse?

**Dr. Catherine Beaudry:** Women are systematically paid less. When I talked about the domination, it's in terms of graduates. We have more at the bachelor's, master's and Ph.D. levels in much of the universities. We have more women who graduate now than men. Men dominate in physics and engineering, but that's about it. In terms of pay gaps, women systematically have less remuneration.

**Mr. Gerald Soroka:** You know, it's kind of surprising. Universities usually talk about how there are opportunities and equal opportunities for everyone regardless of your race, colour or sex, yet it's continually being proven that's not the case. Why do you think they're not following their own guidelines or, I guess, the structure?

**Dr. Catherine Beaudry:** I think they probably are. If you look at the age difference, in every cohort women are slightly younger than men, so that explains maybe a \$2,000 or \$3,000 difference in terms of cohort effects. If you look at the Statistics Canada data, they are by groups. You have the median salary or the means salary—I can't quite remember—of the whole of assistant professors, the whole of associate professors.... If you look at the data and you look at the age difference, very often it's one or two years. That is enough to explain some of the difference.

Then, if you add to it that some men will have asked for market premiums when they were first recruited, this market premium is kept all through their careers. If you start with better pay when you're an assistant professor, this will just accumulate as you move up the ladder. I think these are the factors that really affect it.

If you have some universities that don't have a collective agreement, where you make up for the time when you take maternity leave, that delays your promotion. We looked at the delay of promotion. People who have their kids between being an assistant professor and a full professor will be those, both men and women—

• (1815)

**Mr. Gerald Soroka:** Okay. I have a question, then. I'm sorry. I don't mean to interrupt, but my time is getting short.

I'm just curious. With this kind of information that you're telling us just now, what is the role of a government to try to make that more equal and fair to everybody?

**Dr. Catherine Beaudry:** I think women need to be aware that they can ask for a market premium. Very often, women fall off their chairs when they realize that some of their colleagues have market premiums, and they didn't even think for one minute to ask for them. My colleague was talking about how difficult it is to find a job—

**Mr. Gerald Soroka:** Okay. That still doesn't help me with that question, but thank you for that anyway.

I have another question. You talked about unions and how the faculties, if they're unionized, are actually paid more closely and there's not as much of a pay gap. Do you think that if universities or colleges were more unionized they would have a lot better bargaining, or is that not a factor?

**Dr. Catherine Beaudry:** Collectively, they would have a much stronger voice if they were unionized, as opposed to each person negotiating a salary in the office of the head of the department.

**Mr. Gerald Soroka:** Thank you. I just wanted to get your feedback on that.

How much time do I have left? I think I'm done for the day.

**The Chair:** Thank you. It's sometimes quality over quantity.

Ms. Bradford, we'll go over to you for five minutes, please.

**Ms. Valerie Bradford:** Thank you, Mr. Chair.

Continuing with the discussion about parental leave and how that has impacts, during the Government of Ontario study on the gender wage gap, the Ontario Confederation of University Faculty Associations wrote:

Parental leave provisions that normalize a more equal distribution of childcare and domestic responsibilities would promote greater equality among men and women in the home while also working to ensure the career impact of parental leave is more equitably shared among women and men in the workplace.

I'll start with you, Dr. Beaudry. Can you share any data about the take-up of parental leave by gender among academic staff in your institution?

**Dr. Catherine Beaudry:** At my institution, the parental leave for men is five weeks. For women, it varies widely. I'm not sure I understand. Most professors will take the parental leave that they have at their disposal. As for whether they take care of the children, I don't know.

I have some interesting information. In other studies, we looked at the proportion of house chores and child care that was done by men and women. Systematically, women have the bulk of the child care, and that has a direct incidence on their publications, their citations and the repercussions of that.

**Ms. Valerie Bradford:** Under employment insurance, I think there's some flexibility as to how the parents decide to share the benefits between them. I am wondering whether there are any additional changes to the parental benefit system within EI that you would recommend that would encourage a more equal distribution of parental leave. I think there is some flexibility, but I think the actual practice is that it's certainly not a fifty-fifty proposition.

**Dr. Catherine Beaudry:** It's definitely not. It's not a fifty-fifty proposition. You need a cultural change for men to decide to stay one year at home with their children and for women to do the same. Throughout society, that needs to change. It's not only in academia. The pressure under which academics are to perform.... I don't think that, you know.... Some of my female colleagues took two weeks of maternity leave. Others took a year. It depends on what the individual chooses. If it were a cultural change, then, yes, I think across society we would need to have this reflected, not only in academia.

• (1820)

**Ms. Valerie Bradford:** This next question is for both of you now.

Does your institution provide any additional child care services or parental benefits to promote a more equal distribution of child care responsibilities between the parents of different genders?

Each of you could maybe answer that.

**Ms. Robin Whitaker:** I guess I could start on that.

I will say, just on the previous question, that I think that's another place where unions do have a very important role to play in negotiating parental leave benefits. However, your question was about the provision of child care. While I think that institutions and faculty associations or faculty unions have a vital role to play in lobbying for those at the institutional level, I think that we've seen how important it is that governments play their roles in ensuring, at a systemic level, that child care is available.

We have the good example of Quebec, and it may be that's one reason, potentially, why things have been better at some institutions in Quebec. The federal government has played an important role there. I think we can extend that good role model of early childhood education to post-secondary education as well. Of course, the provision of affordable, accessible child care makes a huge difference to parents in every sector, not least in universities and colleges. That's a good model for the public funding of education across the board.

While we can look at what institutions can do, I think that, for this committee, it is really important to just underline that the federal government also has a key role to play. There's been some good movement, and we just have to continue building on that good work.

**Ms. Valerie Bradford:** Now I'll go to the dimensions initiative, which is administered by the Natural Sciences and Engineering Research Council for the three granting agencies. It has codeveloped a handbook for post-secondary institutions seeking to increase equity, diversity and inclusion in their environments.

**The Chair:** I'm sorry. I have to cut you off there.

**Hon. John McKay:** I know how it feels.

**An hon. member:** We all do.

**The Chair:** We have five minutes left, and two and a half of those minutes will go to Monsieur Blanchette-Joncas.

[*Translation*]

**Mr. Maxime Blanchette-Joncas:** Thank you very much, Mr. Chair.

Dr. Beaudry and Ms. Whitaker, I'm glad you have a lot of data to give us, but I want us to stay focused on solutions. What are the federal government's levers to really reduce the pay gap that may exist in university faculty? Do you have any solutions for us?

**Dr. Catherine Beaudry:** First, pay gaps must be properly measured by comparing what is comparable. In the case of people who publish at the same frequency and receive comparable funding, there is generally no gender gap. It's the access of young professors, particularly young women, to this funding and to conference support that explains some of the gaps, not to mention the access to child care.

In England, I was paying 45 pounds a day for my two young children. I came back to Quebec in 2002 because there were \$5 child care centres. It cost me \$10 a day to look after my two children. If you do the math, the financial difference is glaring. If we had day care systematically established in all universities, it would bring communities closer together. Doctoral students and post-doctoral students also have children, who could go to the same day care centres as teachers' children. These day care centres would then help strengthen communities because we would all be in the same boat. However, we are all fighting for child care spaces, and there are none. I can't even imagine what's happening in the rest of Canada.

**Mr. Maxime Blanchette-Joncas:** Thank you, Dr. Beaudry.

Go ahead, Ms. Whitaker.

● (1825)

[*English*]

**Ms. Robin Whitaker:** In addition to the collection of data and proof, which has already been mentioned, I mention again a strengthened federal contractors program. That would bring more universities and colleges under federal legislation. In 2013, we saw the threshold to be brought into the federal contractors program increase substantially. A number of universities that had been under that legislation were removed.

I think lowering the threshold and then strengthening the legislation that's applied to employment equity and pay equity would be a very concrete thing that the federal government could do.

Going back to a point I made earlier, working with the provinces to stabilize funding to post-secondary institutions—

**The Chair:** That's great. Thank you. We have that previous comment on the record. I'm sure we'll be using it. Thank you for that.

Now, to finish this up, we go to Mr. Cannings for two and a half minutes, please.

**Mr. Richard Cannings:** Thanks.

I'm going to turn to Dr. Whitaker again.

It strikes me that one of the really sticky parts of this issue is the inherent bias that exists in, basically, all of us. When we have a system whereby decision-making positions are dominated by men.... Hopefully, that's changing. If there's any data that says that's improving, I'd like to hear it.

When we have things like merit pay, time to promotion, starting salaries, professional fees and bonuses, all of these seem to be things that would, for the most part, be decided by people in high places or in the committees that make those decisions.

How do we get around that? How do we fix that, or do we just have to wait until that world stabilizes in terms of women being equal in number to men?

**Ms. Robin Whitaker:** No, I don't think we have to wait. I think there are things we can do.

I think you're right: What we need to do is address the systemic issues that take it out of the hands of individual negotiations, the merit pay, the market differentials.... Collective bargaining has been one important mechanism for doing that. As well, certainly, things like compression of salary scales move people up in fewer and bigger jumps, so that you have a transparent salary scale. Women get to an equal threshold more quickly and then are there for longer.

Also, more transparency about what is happening and certainly addressing where there are employment equity gaps in certain fields, the STEM fields that Catherine Beaudry mentioned, but also architecture and some other fields, which tend to be the ones that command the market differentials.... I think there are many things we can do if the will is there to do them, but it does come down to removing those moments where the bias or the discrimination can come in. There have been efforts to reduce those or to minimize the impacts they can have, certainly, such as not allowing market differentials to persist throughout a career and those kinds of things.

• (1830)

**The Chair:** That's great. Thank you. I think that's a great place to leave us at.

Thank you, Mr. Cannings.

Thank you, Catherine Beaudry and Robin Whitaker, for your testimony and your participation in this study. It's very great work that

you're doing outside this study and by contributing to our study, so thank you. If there are additional comments, please submit them to the clerk.

On that note, as per the motion that we adopted on September 18, the request for the submission of briefs has now been published online. It will be open for the next three weeks. The study page includes a link to submit a brief, as well as the full text of the motion and the administrative information for contacting the clerk, so look at our website there.

Also, in the discussion with the analysts and clerks—if I could just have your attention for one or two more minutes, members—on the deadline for the suggested witnesses for the study on the integration of indigenous traditional knowledge and science into the government policy development, we will be taking a list of those witnesses until the end of the day on Friday the 13th. Please include your party affiliation if they are coming in through your offices. Should the committee wish, the analysts can prepare this list of witnesses for the parties to consider when they're drafting their list.

I also have a reminder that we're not going to be meeting on Monday, October 2, and that at the meeting of Wednesday, October 4, we will be resuming the studies we've been working on today and continuing the good work.

Congratulations to the committee for a great meeting and, again, to the witnesses.

With that, I'll ask if we can adjourn.

Thank you. We're adjourned.





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