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Thursday, June 12, 2008

Chair

Mr. James Rajotte

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● (1135)

[*English*]

The Chair (Mr. James Rajotte (Edmonton—Leduc, CPC)): I'll call the 46th meeting of the Standing Committee on Industry, Science and Technology to order.

I apologize, first of all, to the witnesses. We had votes, which delayed us in the House for at least half an hour, so we will unfortunately have a shorter time period.

For the first panel, we have three organizations. First of all, from the Coalition for Canadian Astronomy, we have the co-chair of industry, chairman of the board, and CEO of Empire Industries Ltd., Mr. Guy Nelson. We have the co-chair of the Association of Canadian Universities for Research in Astronomy and past-dean of arts and science for the University of Toronto, Dr. Pekka Sinervo.

From SNOLAB, we have the director, Mr. Tony Noble. We also have the director of the Sudbury Neutrino Observatory Institute, Mr. Art McDonald.

Our third organization is the University of Victoria. We have Martin Taylor, who is the president and CEO of Ocean Networks Canada. We also have Cindy Paquette, the executive director of government relations for the university.

Welcome to all of you.

We will start in that order, with the Coalition for Canadian Astronomy. Please limit your opening comments to five minutes from each organization, and then we'll go immediately to questions from members.

Mr. Nelson.

Mr. Guy Nelson (Co-Chair, Industry, Chairman of the Board and Chief Executive Officer, Empire Industries Ltd., Coalition for Canadian Astronomy): Thank you.

We'd like to thank the committee for this opportunity to appear today. The Coalition for Canadian Astronomy was formed in 2000 and is unprecedented in the Canadian science community because three partners voluntarily joined together to form the coalition: professional astronomers, academia, and industry.

The coalition is a unique Canadian response to the challenges posed by the globalization of astronomy. The massive engineering scale and technological sophistication of the next-generation telescopes requires the intellectual and financial resources of the international astronomy community to plan, design, and construct them. Canadian astronomers, leaders in the global astronomical community, knew they had to change to be part of this new era or be left behind. After lengthy debate and discussion within the astronomical community, a set of priorities was identified that would form the basis of a long-range plan for astronomy and astrophysics.

In short, the LRP was the community's strategy to adapt to and thrive in an era of globalized astronomy. We're aware of no other sector where a scientific community, academia, and industry work so well together to ensure the success of the plan. Our plan is working. The priorities identified in the LRP are providing Canadian astronomers with the opportunity to work on world-leading projects so they may continue to rank as the world's best in astronomical research.

Astronomy is also unique in that it has a rich history of creating commercial benefits from its scientific research. We not only benefit from the scientific achievements and discoveries resulting from astronomical research, but the research generates economic revenues through the knowledge gained in developing the tools and equipment needed for astronomy projects.

The company I run, for example, has completed over $300 million worth of engineering and construction work building telescopes around the world. As a direct spinoff, we've also completed $300 million worth of work in the amusement ride industry. We're currently in the design phase to put over $300 million towards building the world's largest telescope, and we're currently designing and will ultimately build over $300 million in amusement rides that will be exported around the world. And our company is only one example.

Previous federal government investments in astronomy have generated hundreds of millions of dollars in business for a wide range of Canadian companies. Past economic analysis and experience has shown that Canada receives at least a two-to-one direct benefit for every federal dollar invested in astronomy. The indirect return is as high as ten to one, since the knowledge gained working on astronomy projects leads to new business opportunities in sectors far removed from astronomy.

There are three primary areas in which astronomical research has contributed to the Canadian economy: through direct contract awards to Canadian companies, through the development of spinoff technologies, and through skills development. The first economic impact consideration comes directly from the astronomy projects themselves, which today can run into the hundreds of millions of dollars.

While the direct return on investment in astronomy is impressive, the return generated from the development of spinoff technologies is phenomenal. The contracts and work experience that have come from astronomy projects have generated new knowledge and technological developments that produce a variety of spinoffs and market advantage for Canadian industry that weren't understood at the time the first investment was made. The knowledge gained leads to new business opportunities in sectors far removed from astronomy. Examples of spinoff technology include digital cameras, technology for MRIs, and theme park rides.

Perhaps the most significant knowledge advantage comes from the number of highly skilled young people trained in LRP projects. Here the impact of the LRP has been very significant, as the number of advanced master's and doctoral students have doubled in astronomy and astrophysics over the last decade.

The coalition has been working closely with the National Research Council to secure the necessary capital funding for the remaining ground-based elements of the LRP. The NRC has the mandate to operate and administer Canadian astronomical observatories, but does not have enough A-base budget to support the LRP. In fact, there's no single agency that can fund our projects. This has forced us to deal with a myriad of agencies with different mandates and reporting requirements. This is not conducive to long-range planning, especially with international partners.

Overall investment in the LRP to date has totalled $85 million. This government investment has enabled Canada to go forward on the LRP, with the Canadian companies involved in these projects developing world-leading technologies. This continued financial support is necessary to ensure the continued success of astronomy in Canada.

If the private sector benefits so much from these projects, why are they not making these initial investments? In other words, why does government always have to foot the bill? The short answer is simple. There is no business that would support investing in an astronomy project given private sector timelines and risk tolerance. In addition, there's no commercial value per se in designing and building the next-generation largest telescope at the outset. We recognize that there are limited government dollars to go around; therefore, we believe the government needs to invest strategically in scientific research and disciplines that clearly lay out plans for excellence and have a proven track record of impressive financial returns.

● (1140)

The Coalition for Canadian Astronomy feels strongly that strategic investments in scientific research will help improve Canada's global competitiveness. When carried out in a coordinated way, federal government investment in scientific research will improve Canada's competitiveness and economic growth.

We strongly encourage the committee to address scientific funding in its final report, and to do so in a way that recognizes the realities of big science. Investments in science are delivering tremendous benefits to the Canadian economy and to our competitiveness globally. Those benefits will continue with a coordinated Canadian approach to scientific funding. As such an approach is developed, sciences like astronomy that have a clear plan that involves all relevant stakeholders, a demonstrated record of delivering scientific excellence, and proven economic returns should be supported with continued funding.

Thank you.

The Chair: Thank you very much, Mr. Nelson.

We'll go to Mr. McDonald.

Dr. Art McDonald (Director, Sudbury Neutrino Observatory (SNO) Institute, SNOLAB): Thank you for the opportunity to speak to you about the Sudbury Neutrino Observatory and SNOLAB.

These facilities give Canada the best underground laboratory in the world and provide the lowest-radioactivity location ever created. The experiments conducted there are the world's best basic science and are attracting top international scientists and very large-scale new experiments. Many young people are associated with this frontier science and technology, including five new Canada research chairs.

In pushing these technology frontiers, we involve Canadian industry to our mutual benefit. You see some examples here on the page: Vale Inco; Petresa Canada; and BTI, Bubble Technology Industries. We also work extensively with AECL and Ontario Power Generation in our extensive use of heavy water in the Sudbury Neutrino Observatory.

Results from the Sudbury Neutrino Observatory have really made a substantial impact on the world scene in terms of basic science. They were cited as one of the top two scientific breakthroughs in the world in 2001-02 by *Science* and *Discover* magazines and by the American Institute of Physics. We were able to change our understanding of the basic laws of physics in a very fundamental way and we were able to confirm in great detail how energy is generated in the sun.

The new SNOLAB facility, which is an extension of the two-kilometre underground location in Vale Inco's Creighton mine near Sudbury, is largely complete, and it's poised to make further high-impact discoveries, such as determining the identity of the dark matter particles known to make up 23% of the universe but whose express identity is not determined as yet, and also the origin of matter in the early universe. According to a recent high-level international review committee, “For the next 5 to 10 years, SNOLAB has a special window of opportunity: With its great depth (significantly greater than any other underground laboratory) and the proper infrastructure it is uniquely positioned to make Nobel Prize winning discoveries.”

NSERC is providing operating support for Canadian scientists developing new experiments to be sited in SNOLAB, and there will be substantial international contributions to the capital and operating costs of experiments. But the international standard for such basic science laboratories is for them to concentrate on the cost of experiments and for the host country to provide the operation cost for the facility itself, giving our scientists equivalent advantages internationally.

However, there is no current federal program available to us to provide long-term operating support for a major basic science international facility like SNOLAB. Before operations started in 2007, we sought support from Ontario's ORF-RE program and the new CECR program from the federal government. We did receive positive response from the provincial program and we have six years of support there, but we were told that as basic science we did not qualify for CECR without having a substantial commercial objective, and we also did not fall in the four restricted categories of activity for that program.

The level of yearly operating support we're talking about here is about $6 million, of which we have about $3 million secured, assuming we're able to get matching for that. NSERC and CFI councils therefore took immediate ad hoc action in November to provide matching funds for a two-year period in order that we would be able to proceed in a steady way, but we have an immediate challenge in that we must obtain federal support immediately for long-term operating beyond 2009 to match the provincial and the university commitments. The uncertainty of our long-term funding in this situation is making it difficult for us to deal with international experiments wishing to come to the laboratory.

Such uncertainty is a real problem for major facilities like this. Of course we're not the only ones facing this problem: NEPTUNE, the *Amundsen* icebreaker, the Canadian Light Source at Saskatoon, and, on a somewhat smaller scale, major facilities like HPCVL for large-scale computing have similar difficulties. Combined, the order of magnitude of the required operating support is such that it is far beyond the capacity of granting councils such as NSERC to handle without a significant incremental increase in their yearly funding. In fact, when we originally submitted our application, NSERC was identified as a potential source of operating support. It has sought additional funding for this, but its recent budget increases have been targeted for other things. CFI does provide short-term operating support for their capital projects, but this is for the long term.

If NSERC were to fund these projects from their base budget, it would have to do so at the expense of funding for the research being done at these facilities, creating a situation that would penalize Canadian scientists in their own laboratories for their great ideas.

● (1145)

This is an example of how major science facilities are an important part of the scientific landscape in Canada. These facilities in general have been selected as the best possible. They are partnerships between universities, industry, and government, and they attract Canadian and international scientists and the very best students, preparing them for eventual influential positions in industry and academia.

An overall governmental policy for major science facilities is badly needed to provide a full overview and funding approach from the initial proposals through the life cycle of the projects, including construction, operation, and of course decommissioning when the projects have fulfilled their mission. With such a policy and such facilities as have been put forward so far, Canada can lead the world in these important areas of research.

Thank you for your attention.

The Chair: Thank you very much, Mr. McDonald.

Mr. Taylor, go ahead, please.

Dr. Martin Taylor (President and Chief Executive Officer, Ocean Networks Canada, University of Victoria): Good morning. I welcome this opportunity to speak with you today about the exciting opportunities for Canada created by our country's major science facilities.

I speak as the president of Ocean Networks Canada, the not-for-profit organization created by the University of Victoria to administer NEPTUNE Canada. NEPTUNE Canada is the world's first regional cabled ocean observatory. It's located off the Pacific Coast on the Juan de Fuca plate, one of the world's most active tectonic plates.

NEPTUNE Canada is one of several major science facilities in Canada, made possible by over $100 million in capital funding from the Canada Foundation for Innovation, with matching funding from the Province of British Columbia and from industry.

NEPTUNE Canada is truly transformative. In contrast to traditional ship-based observation, continuous power and communications to suites of instruments connected by submarine fibre optic cable systems allow continuous measurements of ocean processes and events of profound importance for the future of our environment and society.

The eyes of the world are literally on NEPTUNE Canada as the first in a new generation of ocean-observing systems that provide for the remote control of instruments and the streaming of real-time data to Internet web platforms. The research enabled by NEPTUNE Canada's leading-edge engineering and communications technologies puts Canadian scientists in a lead position internationally by allowing for integrated studies of the ocean's physical, chemical, and biological processes in ways not previously possible. Not only is NEPTUNE Canada supporting transformative research and attracting the best ocean researchers, technical staff, and students in the world, it also has profound importance for public policy, commercial opportunities, and public education and outreach. The results from NEPTUNE Canada will inform some of our most important public policy issues: hazard mitigation, including earthquakes and tsunamis; ocean climate dynamics and climate change; resource assessment, including fisheries, gas hydrates, and oil and gas; and the sovereignty and security of our ports and ocean shipping lanes.

In terms of commercial opportunities, NEPTUNE Canada is a test bed for the next generation of ocean-observing system technologies and instrumentation; for the development of new ICT for massive data management and archiving solutions, which have applications well beyond ocean science; and for the creation of web- and print-based knowledge products about the ocean. We are already partnering with Canadian industry and with international companies to capitalize on these opportunities.

Public education and outreach is another major focus for NEPTUNE Canada, recognizing the importance for K to 12, for college and university students, and for the public at large of expanding our understanding of the oceans at a time when they have never been more important to our national and global futures.

Implicit in all of these strengths, applications, and opportunities is the close alignment of NEPTUNE Canada with our federal S and T priorities in the areas of environmental S and T, energy and natural resources, health and life sciences, and information and communication technologies. In each of these areas, NEPTUNE Canada contributes directly to our national S and T agenda by promoting our country's knowledge, people, and entrepreneurial advantages by translating excellent research into applications and action.

Canada is now in an impressive position in international S and T through the capital funding of these world-leading major science facilities, including NEPTUNE Canada. And yet for NEPTUNE Canada and for Canada's other major science facilities, including the Canadian Light Source, SNOLAB—which you've just heard about—and the *Amundsen* icebreaker, there is a vital missing ingredient, which puts seriously at risk the international leadership and national advantages and opportunities I have spoken of so far. While our country has a strong suite of programs to fund the capital infrastructure, direct research costs, and human resource costs, we lack a mechanism to make effective funding decisions regarding the operating costs of national science facilities.

Our current leadership position is precarious given global competition and plans in the G8 to invest in S and T and given the massive investments under way in China and India. Achieving the benefits of our investments for Canada and Canadians requires that we find a way to bring predictability and stability to funding the operations of these facilities.

● (1150)

To date, ad hoc arrangements have been made to provide short-run operating costs. In the case of NEPTUNE Canada, we have two years of one-time funding to mid-2010 from NSERC, CFI and the Province of B.C. Why was the provision of operating funding not planned for at the time of committing the capital funding to build these facilities, as is the case in other countries such as the U.S., Australia, and the U.K.? Lead universities for the major science facilities were informed, as you've heard in the case of SNO and us at NEPTUNE Canada, that funding would be provided through NSERC programs. But the reality, as you've heard already, is that there is no NSERC program to fund the annual operating costs level required by these major science facilities. There is a major and serious gap in the system.

If NSERC were to fund the operating costs through existing programs, it would in fact so seriously erode the capacity of these programs that it would be entirely counterproductive to the overall mandate of NSERC to support the brightest and best researchers and students in the sciences in Canada. Within their major funding constraints, the universities—in our case, the University of Victoria—have made substantial contributions towards the operating costs, but these can never be at the level needed on an annual basis.

A new program is therefore urgently needed, which the major science facilities could apply to on a competitive, peer-reviewed basis. It should be a program that makes a sustained commitment. The five-year funding cycle in place with the TRIUMF laboratory for particle nuclear physics at UBC is a good one, as it has built-in international peer review of performance as the basis for funding renewal.

This is an exciting time for Canada, because of the leadership position it has gained through the CFI and other federal investments in S and T. But for this position to be maintained, and for the economic, environmental, social, and health benefits for Canadians to be achieved as the return on those investments, the major science facilities' operating funding challenge has to be met.

I thank the committee for the opportunity to share this urgent concern, and I welcome the opportunity to respond to your questions. Thank you very much indeed.

● (1155)

The Chair: Thank you very much, Mr. Taylor.

We'll now go to questions from members. We'll start with Mr. Eyking.

Hon. Mark Eyking (Sydney—Victoria, Lib.): Thank you, Chair.

I'd like to thank the presenters for coming here today and highlighting Canada's accomplishments. Whether under the water in the Pacific Ocean, under the ground in Sudbury, in outer space, or out on the icebreakers, it's quite amazing. Also, you mentioned quite a bit about the funding required and that more was needed.

But my question is about how we can reach out to Canadians, especially young people, to show them what we're doing, so they can be proud as Canadians that we're leading the world with this technology, and to show them where we're going and to encourage them to get into this field. I'm wondering if we can make a better connection there. How can we reach out, from your groups' perspective and that of universities, to get right into the classrooms and somehow get them engaged and excited about what we're doing, showing them that we can do just as well as anybody in the world?

The Chair: We'll start with Mr. Taylor, and then go to Mr. McDonald.

Dr. Martin Taylor: Thank you for the question. I think it's a terrific question, because it gets to the root of where the science culture is in this country and where it is going to come from, in terms of enthusiasm to support all of the things the three of us have talked about.

In the context of NEPTUNE Canada, I mentioned briefly in passing the fact that public education and outreach is a key component of what we're committed to. Just to give you one example, we've recently been recipients of a grant from CANARIE that will allow us to build the new generation of web-based platforms, Web 2.0, with the explicit intention of reaching the K-to-12, post-secondary, and general public audiences. This will essentially bring a new “world” to the world, and expose all of us to what's happening under the oceans, for all of the reasons we are increasingly aware of as key.

So thank you for the question, because I don't want to leave you with the impression that what we are developing here is something that is just for a select group of scientists. It isn't.

Hon. Mark Eyking: But on that, how can we get right into the classrooms? I'm assuming that in many of these classrooms, in grade 3 or 4, or 8 or 9, maybe they are talking about the science that we were doing 10 or 15 years ago. How do we get in there with up-to-date stuff to make them proud and engaged? Is there a way?

Dr. Martin Taylor: One of the wonderful things in this country is the collectivity. We are admired internationally for the collectivity in our classrooms, even with our remote geographies. As a consequence, with web-based Internet platforms, for example, we're streaming our data to them, and then we'll obviously create, and are already creating with our VENUS observatory, knowledge packages, for want of a better term, that can be used by teachers directly in the classroom. That is a key piece of it. We're already moving on that front.

The Chair: Mr. McDonald.

Dr. Art McDonald: I would like to expand on that.

We have had a tremendous advantage from the outset in being close partners with Science North, the science centre in Sudbury, and we have had exhibits there from the very beginning. They have 300,000 people a year going through there. We have classes of younger grades, the very ones you're speaking about, coming there and working with people to understand what is happening right there in the community as well, in terms of personal interest. We have a similar exhibit at the Canada Science and Technology Museum here in Ottawa.

We are also now in high school textbooks. The Sudbury neutrino results are in the grade 12 textbooks in physics. We set out to do textbook science, and we in fact are doing it.

We've recently partnered with Perimeter Institute for Theoretical Physics in the development of a CD and associated teaching material on dark matter, for high school teachers. The Perimeter Institute brings in the best grade 11 students, many of them from across the country, and international high school students on a yearly basis. We're working with them on expanding the program to include SNOLAB, now that we're in this area.

We're continually looking for the opportunity to do it. It is non-trivial, I think, that in fact, at the time of our discoveries, we had substantial press coverage of our discoveries, and that's ongoing on Discovery Channel and so on, on a regular basis. So we do reach the public in general on what we're doing. It's very high on our agenda.

● (1200)

The Chair: Just before I go to Mr. Sinervo, members, I think there's a vote in the House at 12:30. We're just trying to clarify that. I don't know exactly what it's on, but we'll try to clarify that as well.

Mr. Sinervo, we'll go to you.

Dr. Pekka Sinervo (Co-Chair, Association of Canadian Universities for Research in Astronomy (ACURA) and Past-Dean of Arts and Science, University of Toronto, Coalition for Canadian Astronomy): Let me just fill in a little bit on the astronomy side as well.

Public outreach and broad education of the Canadian public have been a priority in the astronomy plan right from the outset, and significant resources have been allocated towards that. The long-range plan, in fact, made a proposal that approximately 2% of all the funding would be put toward directed efforts to engage the public through outreach activities, as well as targeting the science education efforts. Some of that is already going on, even without that targeted funding. The reality, of course, is that to make this really work, you have to put your money where your mouth is, and that's one of the challenges, that we don't have a national science education plan—and I speak as an educator now. We actually really don't have that particular vision in mind.

That said, 2009 is the International Year of Astronomy, and the professional organizations, the Canadian Astronomical Society, as well as the several amateur astronomical societies are very strongly engaged, working collaboratively on actually using that as a platform in which to bring the excitement, the research results, and what the future of astronomical research will be to people in the classroom, our young children who are going to be the next generation of scientists.

Hon. Mark Eyking: Thank you.

The Chair: Thank you very much, Mr. Eyking.

I have some more information. The vote is at 12:30. The committees are supposed to officially stop when the bells start.

As chair, I need unanimous consent. I'd like to get at least two more members in for questions—

Some hon. members: Agreed.

The Chair: —Madame Brunelle and then a Conservative.

We'll start with Madame Brunelle.

[*Translation*]

Ms. Paule Brunelle (Trois-Rivières, BQ): Good day, sirs. It is a pleasure to meet you. We feel somewhat pressured, like we're in a submarine, with the lights flickering on. It's a little worrisome.

My remarks are directed to the various groups. I read your briefs and I would like to discuss financing with you. I see that 3% of Canada's science budget goes to “Big Science” projects such as yours. In your submissions, you all mention that when it comes to financing, the decision-making process is not always effective in terms of investing in Canada.

You note that in the field of astronomy, per capita investment in Canada is eight times below the level in the United States, and five times below the level of European countries with comparable GDPs. If we look at what's being done overall, we see that some of the financing is international in scope and that there is a significant level of collaboration.

I would like to hear more from you about financing.

Those working in the field of astronomy maintain that they have found a new way of funding big science projects. The Coalition has set up a task force.

How would you propose that these big science projects be funded? There appears to be a problem. I'd like to hear your views on the subject.

Would you care to go first, Mr. Sinervo?

[*English*]

Dr. Pekka Sinervo: Let me start by noting that these projects are all international in scope. In fact, all of the projects the witnesses have spoken about require significant international partnership. That means there is a significant engagement and collaboration internationally right from the outset in terms of identifying what the scientific priorities are, coming to agreement on who is actually going to participate at an international level, and then working to acquire the resources from within each of the appropriate jurisdictions that the scientists are coming from to bring their share of the project to the table. It requires a significant amount of collaboration and coordination.

It also takes a significant amount of time. We're talking about bringing together, in some cases, hundreds of millions of dollars of capital funding, plus long-term commitment for operational support—typically anywhere from 10 to 20 years of support, which together equal approximately the total capital investment.

In my view, Canada has done quite well in this particular arena; however, we have suffered from the fact that we don't have a big-science strategy. We don't have a single port of call or a single organization within the country that takes a leadership role in identifying where Canada should put its resources to most effectively leverage its impact internationally.

● (1205)

The Chair: Mr. Taylor.

Dr. Martin Taylor: Perhaps the issue is to distinguish between the three types of funding. The first is capital funding, and I think what you've heard from each of us, certainly in the case of SNOLAB and NEPTUNE, is that the capital funding is in place and we're well through the building of those facilities.

The second category is the operating funding, which is the annual money that's required to cover the basic operations of the system. That's the missing piece.

The third piece is what I would term generally the experimental funding—in other words, the funding that the individual researchers or teams of researchers bring in from NSERC and other agencies internationally to then conduct the experiments on that system. There are programs in place for that funding to be drawn down.

It's that middle piece that is absolutely vital. And the rule of thumb, which I think has been validated by CFI, is that the operating funding—that core operating funding, if you'd like to keep the heat and light on in these facilities—is at about 10% of the capital. So if you've built a $100 million facility, you're looking at $10-plus million a year to support that basic operation and maintenance cost.

That's the missing piece, and without that, the rest falls apart. The capital investment comes to naught, because you can't operate the facility and the experiments can't be conducted even though the researchers could, in principle, draw down the money to conduct those experiments.

The Chair: Mr. McDonald.

Dr. Art McDonald: Perhaps I could add one further thing. Canada is actually, in general, the envy of other countries in terms of the way in which it is able to do research and development. Things such as CFI, the Canada research chairs, and the indirect funding and so on that have been put in place over recent years have given Canada the opportunity to move forward significantly. We're able to attract the best people to come and do things, and we're able to do very good things across the broad range from basic science to applied technology, with the exception of what Martin identified, and that is a clear picture of how to deal with the operating support for things that are funded as capital investments.

Also, when you get to the point where you're dealing with the large-scale facilities—which are the things that you should be doing as a certain percentage of the total, because they enable you to do those things that can be done only on a large scale, and very often those are cutting-edge things—when that's a fraction of your budget, you then have different demands in terms of being able to operate such things.

So an overall policy for big science facilities is needed to deal with all of the spectrum that Martin Taylor outlined, and the one we're particularly concerned about right now in our case is that missing operating part.

The Chair: Just very briefly, Mr. Nelson.

Mr. Guy Nelson: I'd just say that in the case of astronomy the issue is more on the capital side. We're working right now in collaboration with other countries on two major projects that are in the order of magnitude of $1 billion each—of which we're a percentage. And that is to build the facility. It sounds like we may in fact have problems with the operation as well, but we're approaching it to solve both problems.

So the issue is that we don't have a place to go for that capital funding to actually build the facility, which we've unfortunately been the ones to have designed. The Canadians have been instrumental in designing the facility, and we own 25% of the design portion. But it's now coming up time to build it, and we don't have that money.

● (1210)

The Chair: Thank you.

Merci, madame Brunelle.

Mr. Van Kesteren.

Mr. Dave Van Kesteren (Chatham-Kent—Essex, CPC): Thank you, Mr. Chair.

Thank you, witnesses, for coming.

The funding is always a problem, isn't it?

The first question I want to ask is at what point the government begins to interfere with pure science and with what government generally looks for, which is a return. What's the breaking point? Can you give me any indication of where you think we need a certain amount of discretion on your part as to what should be spent?

Dr. Martin Taylor: Let's start with the federal S and T strategy, because I think what the current government has done—and clearly it builds on the previous government's initiatives through the innovation strategy—is establish some areas in which this country wants to position itself internationally as amongst the leaders, if not the leader. These are broad areas, admittedly, but nevertheless I think they give some direction, because when we talk about these major facilities, we have to make choices. And I think now we're distinguishing between major facilities or major programs like the astronomy program, which obviously have major capital and operating investments associated with them. We can't possibly think about covering every area and think that we can succeed and afford to succeed as a country in that international arena. It's highly competitive. International collaboration is now the name of the game.

In the case of oceans, we have enviably now taken a lead position in having NEPTUNE Canada as the world's first regional cabled observatory. Nobody else has one. I've been in Japan, I've been in Europe, and I've been in the U.S., even in the last few weeks in each case, speaking about NEPTUNE Canada and its sister observatory, VENUS, and everybody is envious because we've taken that position. And people understand why Canada has taken that position: we've built a scientific cadre of expertise, and we are bordered by three oceans. With the Arctic obviously now opening up in the way it is, it's of profound consequence to our understanding.

So here's a basis on which, then, I think the federal government rightly has a role, which is to work with the scientific capacity in the country and identify those areas in which we have comparative and competitive advantage and say that these are the areas in which we want to make these big investments and create these national facilities. But having made that decision, as we have done, either in part with the astronomy investments or in whole with SNOLAB and NEPTUNE, we have to follow through.

Mr. Dave Van Kesteren: Do we punch above our weight? If we look at our population, I think we have 0.5% of the world's population, but I understand that as far as wealth is concerned, we represent a much larger portion. Do we try to take on too much as a country? Could there be a collaboration? Or do you think we should say these are the areas that we want to be good at, these are the things we want to do? Or have we gone beyond that? Do we need to take a second look and say we have to just back off on this?

Dr. Martin Taylor: Let me just say a few things here that I think are vital.

One is about those investments that have already been made, and those that we may yet want to make. We're here representing investments that have already been made. These are the consequences of investments in our scientists, in our students, in our technical staff over many years. It's not by accident that we have $100 million to build NEPTUNE. It's not by accident that SNOLAB has been built. It's not by accident that we have a long-range plan for astronomy and the observatories that are associated with that. These are results of strategic investments over many years.

I think your question is a very good one in terms of where we go from here, in terms of what other facilities we would contemplate bringing on stream. And that's a very real and important question, because I agree with you entirely that we cannot afford to try to be all things to all people. It would be ludicrous, both economically and otherwise. But for the facilities in which we already have the international leadership, let's back it up and make sure we fulfill them in a way we can be proud of.

The Chair: Thank you, Mr. Taylor.

Mr. Van Kesteren, we'll go to Mr. McDonald very briefly, and then we'll have to go to the House.

Mr. McDonald.

Dr. Art McDonald: We think we punch above our weight in a number of these areas when, for instance, you get, in our case, one of the top two scientific discoveries in the world and, for six months of 2003, the most citations by other scientists in the whole field of physics for our results. That's significant on the world scene.

When you asked about how one should make decisions, one of the things that one wants to keep in mind is balance. We want to have return on investment in this case, but you have to also have the opportunity to let creativity happen. There's a reason Albert Einstein was chosen by *Time* magazine as the man of the 20th century. It's not because he ever built a laser or because he ever built a computer. But the things he did were absolutely essential in terms of people's perception of how to do science in the applied way.

So you need a balance of basic science—and you really want to select the best when you're doing it, and we think our peer review system does an excellent job of that—and strategic programs, but not all of one and not all of the other.

Right now, I think we have a reasonable balance. We're pointing out to you one area that is certainly out of balance, which is operating support for basic science. There is a tendency to move that directly towards the programs that we see in place or ones that are aimed more at applied. That balance is something you want to maintain, and if you do, you'll have the ability to have return on investment not only five years from now but fifty years from now.

● (1215)

The Chair: Thank you, Mr. Van Kesteren.

First of all, I want to apologize profusely to the witnesses. The two votes were unexpected, but they have happened.

I'm going to recommend something to the committee, but I need the consent of the committee to do this. We have a second panel here on tourism. There is the option of moving that panel to Tuesday. I know that's not something they would want to do, but we could move that to Tuesday between 11 and 1 o'clock. I think we can give them the full two hours for tourism on Tuesday.

If the witnesses can stay until two, we'll come back after the vote and continue with this discussion.

Mr. Bruce Stanton (Simcoe North, CPC): It's a good idea, Mr. Chair.

The Chair: Okay. Thank you.

We'll suspend for now. We'll return in about 20 to 25 minutes and continue with this discussion.

● (1215)

(Pause)

● (1250)

The Chair: Let's call the meeting to order again. I want to thank especially the witnesses, with the interruption of the vote, for staying with us until 2 p.m. today.

Again, formally on the record, I do want to apologize to the witnesses on the second panel, but they will be with us on Tuesday from 11 a.m. to 1 p.m., during our regular committee hours.

I will resume with the list. We had finished with Mr. Van Kesteren, and we will now go to Mr. Telegdi.

Hon. Andrew Telegdi (Kitchener—Waterloo, Lib.): Thank you very much.

I come from Waterloo, so I really have an ingrained appreciation for R and D and what it means.

Given the distractions in the United States right now, we really have an opportunity to assemble a critical mass of scientists and researchers to look at Canada. In the example of my community, the Perimeter Institute and the Institute for Quantum Computing really have started to get this critical mass of the best and the brightest in the world coming into those disciplines. I think it's important that we recognize it, because it's an opportunity. Once you have a new administration in the United States they will be distracted for a couple of years, but they'll be on it.

One of the things I was somewhat disturbed by was that at the point in time we had Dr. Arthur Carty as the science adviser to the Prime Minister, it really gave an opportunity to get the whole issue of science right in the centre of government. I think that's incredibly critical.

So I wonder if you could comment on those two points: the critical mass, and having someone right in the centre of government as far as science goes and what Canada can do.

The Chair: We'll start with Mr. Sinervo.

Dr. Pekka Sinervo: On the two points you make around the critical mass and having good science advice on overall national science policy, those are two critical features that have to be appreciated and understood.

I agree completely with the issue around critical mass. In the context of the astronomy long-range plan, that was one of the key overriding principles. The community had to choose where in fact it was excellent, and then focus its resources to maintain that degree of excellence, not spread those resources but actually take advantage of the strength that had already been created within the community, and the excellence, and then build on that. That has meant that Canada is not participating in all of the international astronomy projects. We're participating in approximately 10% of those projects that we could in principle be involved in, because of the need to have critical mass in key areas in order to actually have impact.

As a principle, I agree completely, and the astronomy plan reflects that.

On the issue of how the federal government is able to most effectively get scientific advice, I think the current government has taken a view that a science adviser was not the best instrument, but that perhaps a committee or an advisory panel would actually be an equivalent or better instrument. Without commenting on which one actually is going to be a better mechanism all around, it is fair to say that Canada has not had the sort of voice at a very senior political level giving the informed scientific advice that will help to lead the country forward. From the point of view of the academic community, which I come from, that is certainly seen as a significant weakness in how we can plan and make priorities going forward.

● (1255)

The Chair: Mr. Taylor.

Dr. Martin Taylor: I would echo the comments that Dr. Sinervo just made about the independent advice to government on science and the importance of that being sustained in relation to what happens in other jurisdictions. I have nothing much to add there.

What I do want to talk about a little is the critical mass and the opportunity we have. The good news is that if you look at the Canada research chairs program, you'll see that 30% of those Canada research chairs are filled by people who have either come back to Canada or have come to Canada for the first time. So the investment that has occurred in that particular program has brought dividends to us, and each of the areas that we represent has benefited directly from it. That's been superb. But again, it reinforces the shortness of the window of opportunity. These are the best people in the world, otherwise they wouldn't have been appointed as Canada research chairs, and because they're the best people in the world they can be competed for and recruited elsewhere. So if they're coming into ocean science or astronomy or areas of physics, the three areas that we represent, it's absolutely critical that they have access to the facilities that attracted them here in the first place and that those facilities are not allowed to diminish.

The second comment I would make is in terms of the U.S., because that has particular consequence, I think, for each of us. It has special consequence for NEPTUNE. NEPTUNE Canada was established as an international facility with the U.S., and that still is the full plan. Because the U.S. funding has been delayed due to the circumstances there, it's given us an opportunity in the short run to have Canadian leadership be even stronger than it would have been, increasing its attractiveness to that research community, which again just reinforces the point.

The Chair: I'm sorry, we're well over time.

Mr. McDonald, did you want to make a brief comment here?

Dr. Art McDonald: I think critical mass in our area is being met very well by a combination of things. The Perimeter Institute is one example. That's the theoretical side of the experiment that we're doing. Also, the CIFAR program in cosmology and gravity is doing similar things. The Canadian Institute for Advanced Research has a program that is bringing excellent Canadians together to work in this area. The advances that have been made in the area, together with the astronomy community, are tremendous. Canada really is regarded as a powerhouse in these areas.

I'll make one more comment on the science adviser. It's worth looking at what happened in the United States during George Bush Sr.'s administration, during which, as it happens, a Canadian, Allan Bromley, was a science adviser sitting in the White House, with a very powerful committee working with him that included people such as David Packard from the Hewlett-Packard foundation.

● (1300)

The Chair: Mr. McDonald, I'm sorry, we're two minutes over Mr. Telegdi's time.

We'll go to Mr. Stanton, please.

Mr. Bruce Stanton: Thank you, Mr. Chair.

Good afternoon. I appreciate your patience here this afternoon while we've had some unfortunate interruptions.

Many of the topics that have been raised today were about the—as you framed it—inadequacies around operational costs, the fact that the initial capital investments go in, but there are insufficient dollars to keep that part of the operation alive and well and continuing, and the uncertainty, I suppose, as to how you're going to.... What current sources of revenue do you tap into to help sustain those operational expenses now?

Between the three, if I could get a quick answer to that, I'd still like to go back and put another question, if I could.

Dr. Martin Taylor: For the NEPTUNE, we have two years of short-run funding that comes from a combination of NSERC, CFI, and the province, but in each case they've indicated that this is one-time funding.

Dr. Pekka Sinervo: In the case of astronomy, the National Research Council has some funding from it's A-base to support the observatories that are currently committed to. There is some short-term funding that is not A-base but is one-time only that has been allocated over the years; it isn't committed for the long term.

Dr. Art McDonald: In our case, we have six years of projected support from the Province of Ontario, combined with contributions from the universities over that period of time. We are in the same situation as NEPTUNE with respect to having two years of commitment from CFI and NSERC for matching, but it is the ongoing longer term that we're missing.

Mr. Bruce Stanton: So in fact when we look at the big science projects across the country—and we can probably think of at least a dozen or so, including the three that are here today, but there are others, of course, that are very much in the same situation—we're faced with a situation where Canada already is proportionately investing more of its public investment in government-sponsored as opposed to private investment, or shared investment between industry and government, in research in the country. We're lagging behind other OECD countries in terms of tapping into that business component. What you're proposing is that we continue to bump up and invest more steadily.

This becomes a bit of a problem. As representatives of the public, in terms of the value for the dollar, if you will, we have a responsibility to make sure the public is getting their money's worth, yet we're already somewhat offside on that. Do you have a comment on how we can do what you would like us to do in funding those operating dollars more heavily but, at the same time, be able to rationalize that investment to Canadians?

The Chair: Why don't we start with Mr. McDonald this time, because I'm always cutting him off.

Mr. Bruce Stanton: Then I'm be sure I'll be done, Mr. Chair.

Could each of you comment?

Dr. Art McDonald: As we said earlier, Canada is the envy of other countries in terms of its ability to move forward in research and development as a result of the programs that have been put in place in recent years. And we recognize, of course, that the percentage of GDP being expended by private industry in research and development is lower than in other countries, and that's certainly something we need to target as well.

However, we have to be very careful that we don't lose the advantage that we have in the research that is being supported by the government base, because it's that advantage in Canada that will translate ultimately into the ability of our industries to be competitive in high-tech areas. What we need to be doing is fostering that technology transfer process, but we don't want to do it at the expense of becoming poorer in our ability to do the basic things, or you won't have the ability then to get the industries to be world class.

What we're talking about is something that's missing in the appropriate distribution of funds within the original part you were talking about that is supported by government. Don't lose that advantage in the interests of trying to do something else.

● (1305)

Mr. Bruce Stanton: Okay.

Mr. Guy Nelson: In the astronomy umbrella, I think our company is probably a good example of the direct benefits. The government initially invested in the Canada-France-Hawaii telescope. Our company built the first enclosure for that. From what was spent or invested to buy Canada's ownership position in that particular telescope, we made twice what other countries were contributing to the construction. That has continued to grow. Again, I would say it's probably because of Canada's strength in engineering and construction that we've been able to become leaders as a company and as an industry in the build-out of these facilities globally.

The spinoff we get from that.... I've actually been watching a group, the Fraunhofer Institute in Germany, which is more of an NRC equivalent, that has gone even further in taking research dollars and turning them into a significant revenue from commercialization. So I think there are things we can learn as a country by looking at some other places that have done quite well in commercializing technologies and emulating those where appropriate.

The Chair: Thank you.

Mr. Taylor, just briefly.

Dr. Martin Taylor: Very quickly, I have two comments.

One is that in the case of NEPTUNE certainly, I think one also has to look at it in terms of the return on investment for the public good. And this is in relation to many of the areas I briefly outlined in my opening remarks on the public policy applications of the research, such as hazard mitigation, sovereignty and security, resource assessment, ocean climate dynamics, and those kinds of areas where that return on investment is vital.

My second comment, picking up on a theme that both of the others have mentioned, is that the partnering with industry is already under way. OceanWorks, a major company in North Vancouver, is now competitive in ocean observing systems in Taiwan and Europe as a consequence of the work they're doing with VENUS and NEPTUNE.

The Chair: Thank you.

Thank you, Mr. Stanton.

Monsieur Vincent, s'il vous plaît.

[*Translation*]

Mr. Robert Vincent (Shefford, BQ): Thank you.

Good day, ladies and gentlemen. Thank you for your patience.

I'm concerned about a few things. Mr. McDonald, you stated that there was no long-term funding program in place. What could potentially happen? In your opinion, could the government slash the budgets allocated to you at any time? Are you concerned that at some point, the powers that be may decide that you have received enough funding and let things slide? Are you worried that this might happen?

[*English*]

Dr. Art McDonald: Well, we certainly worry about such things. Who would not?

You are attempting to establish a world-class facility in a situation of great uncertainty, where you're attempting to make promises to international groups who are wanting to come and perform experiments at your facility. However, we were given assurance by the ad hoc actions taken by NSERC and CFI that they appreciated the value of not losing the opportunities that we had—and they should have, based on the strong peer reviews all of these projects had received—and in coming forward with the funding for the short term.

The difficulty is that it is not an appropriate way to do things, if you're going to start out and spend money from a capital point of view—and we have spent a substantial amount through CFI on very good projects—to not, at the same time, have a mechanism whereby you have the operating funding in place, matching the decisions that were made in the first place on the basis of strong peer review. NEPTUNE and SNO and the *Amundsen* were the top three out of 37 projects that were put forward at the time CFI made those decisions. And the fact that the operating program is not there to go along with these capital decisions for the long term is the thing that's missing. Right now, it is not within NSERC's capability to be able to provide such long-term operating funding without impacting the experiments that would happen at these facilities.

[*Translation*]

Mr. Robert Vincent: If I understand correctly, it is like wanting to restore a car and midway through the process, funding dries up and the restoration is put on hold. It makes no sense for the government to think this way, that is to invest this kind of money in a research company... Every day, you must worry—and that goes for everyone here today—that you invested your time and money and yet, may not have enough funding to complete the project.

Do you have any suggestions for us?Only 3% of the budget envelope goes to big science projects. How do you hope to get a share of this money in order to continue your work?

● (1310)

[*English*]

The Chair: Mr. Sinervo.

Dr. Pekka Sinervo: The CFI—which was one of the instruments by which the federal government had put in place the capital funding—recognized fairly early in the program that there was in fact a shortfall in operating support. The legislation for CFI was amended to allow the CFI to use some of its own funding to provide interim operational support. And that has now become a standard part of every CFI project.

However, it is a formulaic model, and it's a small fraction of the total amount of funding that's actually required, and there is no long-term, ongoing commitment. And that's what you're seeing happen with regard to NEPTUNE and the SNOLAB, in that such funding is simply no longer available.

So it's not that there wasn't a recognition early on, but that the government didn't act to put in place a program that would provide the ongoing operational support, or identify the agency that would actually take responsibility for that. And that's the situation we're facing today.

The Chair: Mr. Taylor.

Dr. Martin Taylor: As I mentioned in my opening remarks, there are models already in existence that I think are the solution to the problem. A five-year funding cycle that provides sustained and predictable funding based on peer review of performance is the way to go, in my view. We've got TRIUMF funding on that basis at the moment. It happens to be a contribution agreement through NRC. That's one particular mechanism; it's not the only mechanism that might be possible.

I think we've made a commitment to these big facilities for all the right reasons, and now we have to follow through on a mechanism that will allow us to sustain them so that we can take international pride in what we've achieved.

The Chair: Go ahead, Mr. Vincent.

[*Translation*]

Mr. Robert Vincent: Earlier, you alluded to applied science policies. I'm fascinated by the topic. Could you elaborate further on this for us? We can't help but think about funding. I emphasize this matter because it's important to you. However, we need to break down the budget envelope allocated to you.

Is the field of applied science important enough to take concrete initiatives to secure a portion of this funding?

[*English*]

The Chair: Go ahead, Dr. Taylor.

Dr. Martin Taylor: I think you're alluding in part to the remarks I made earlier in terms of the applications, particularly in the oceans area.

We obviously chose to build NEPTUNE Canada on the Juan de Fuca plate off the west coast of North America because it is one of the world's most active tectonic plates in terms of earthquake hazard and risk. The seismometers that are part of the NEPTUNE system will give us an ability to better understand those dynamics and earthquake forecasts as a consequence. That's one area.

Another area is fisheries. We're seeing huge changes in terms of fish stocks. Our ability to monitor how the oceans are changing as an environment and ecosystem that supports, or doesn't support, various fish stocks is critical, and so on. I don't need to repeat those areas.

I think a consequence of that—and it goes back to the comments I made just a few moments ago—is that these areas are essentially servicing both public good and private benefit. Industry obviously has a vital need to understand what's happening; the fishing industry is a major one. If we talk about offshore resources, that's another one, in terms of gas hydrates, for example, which we're into. We can bring private industry to the table as partners with us when we've got the basic research in place that helps them to move their commercial interests forward, but at the same time we do need to balance that with the fact that there is a vital piece of public good here. That's why we've been partnering with the Department of Fisheries and Oceans, Environment Canada, Natural Resources Canada, and DND. They're in there in spades in terms of their policy needs.

● (1315)

The Chair: Thank you.

Merci , monsieur Vincent.

We'll go to Mr. Arthur.

[*Translation*]

Mr. André Arthur (Portneuf—Jacques-Cartier, Ind.): Thank you, Mr. Chairman.

[*English*]

I would like to move forward from the question that was asked by Mr. Eyking, who brought you to talk about science culture and the necessity of teaching kids the importance of science. Those kids have parents. Those parents pay taxes. Those taxes will perhaps come back to you as grants or operating expenses at some point. The problem is that the Canadian taxpayer will probably not go to university, has never been near a university, and doesn't know about a university. He dreams about the fact that his children will one day go to university; he's not sure about that either.

The responsibility to sell to the Canadian taxpayer the necessity of funding science has always been the responsibility of the government, but the government cannot do such a good job of selling its own expenses. Press conferences and cocktails are nice, but you have the responsibility of selling to the taxpayer the necessity of funding your projects and your toys.

Could you be very specific as far as NEPTUNE is concerned or as far as the underground laboratory in Sudbury is concerned? Tell the committee the concrete, practical things that you've done over the years to bring the Canadian taxpayer on side. What have you done? If the answer is not much, what do you plan on doing?

The Chair: Would you like to comment, Dr. Taylor?

Dr. Martin Taylor: It's a very timely question.

A week ago I was with the board of Ocean Networks Canada presenting a business plan to them. One part of that business plan is public outreach. NEPTUNE, remember, is going to be fully operational within the next year, so at this point we're talking more in terms of what will happen than what has already happened, but within that plan we have developed a number of initiatives that will indeed build on the very good exposure that we've had already.

Part of that is through the electronic media, but very significantly, I think, we are using the Internet now as a mechanism that brings the oceans into the lives of the people you're talking about—not the people who have to go to university to find it, but the people who find the research right where it is. Oftentimes that will come through their kids; the kids will be the conduit. There are all sorts of creative ways in which one can bring that ocean environment to the living rooms of the Canadian public—

Mr. André Arthur: How much of your budget do you intend to spend on public awareness of the necessity of your NEPTUNE project?

Dr. Martin Taylor: That will partly depend on the terms and conditions that are associated with that funding. But if I had the ability to make that choice, it would be in the order of about 15%.

[*Translation*]

Mr. André Arthur: Mr. McDonald.

[*English*]

Dr. Art McDonald: The answer to the question is the same, which is that with the ability to have a secure source of ongoing operating, that is the sort of level that we would wish to spend on such things.

We have a history, starting with the Sudbury Neutrino Observatory, which was a single experiment, the construction of which started back in 1990. We started immediately during that construction period with having Science North from Sudbury come over and film every step of the process. We developed what's called an object theatre in Sudbury, at which the general public is able to come into the middle of a mockup of this facility and get a narrative as to what we're doing. We bring school children through there.

I mentioned earlier the objectives of getting things into textbooks, of providing information to teachers, who can provide it to the children in our—

Mr. André Arthur: You realize, I hope, that the government will likely be convinced by the taxpayer more easily than they will be convinced by you people. You have expensive toys. You want them to be considered necessary for Canadian society, but the last word will be the taxpayers' word. I think there's a poetic beauty in learning that a better observatory will bring a better ride at La Ronde. This convinced me—okay, no problem with that—but the taxpayer has to be satisfaction with his government spending his money on your projects.

Mr. Sinervo.

● (1320)

Dr. Pekka Sinervo: Very briefly, I would just comment that if you look at media exposure, either SNOLAB, or NEPTUNE, or the astronomical projects that Canada is involved in, that's actually very significant.

We have one of our strongest advocates here in this room, Peter Calamai, science writer at the *Toronto Star*. Peter is not the only one, of course, but he himself has been very active in the work of actually conveying what's exciting and what's important about supporting the science to Canadians.

I think the question, though, is that there isn't a venue in which the Canadian public can actually respond to the government with a coherent voice when it's appropriate that this is important. They don't know if a decision's coming forward. If you go and do surveys, you actually get very strong support.

There are 10,000 Canadians involved in amateur astronomy. That just reflects how a very large group of very excited people, who actually do a lot of backyard astronomy, who actually spend a significant amount of their own private time—

Mr. André Arthur: To find pleasure in astronomy is one thing. To want my government to spend money on your astronomy is another thing.

Dr. Pekka Sinervo: Absolutely. My point, however—

Mr. André Arthur: It's your responsibility to convince the public to go and say.... How many members of Parliament receive messages from the public wanting the government to spend money on your project? Not many.

The Chair: That will have to be a rhetorical question, unfortunately, because of the time.

We'll go to Mr. Simard, please.

Hon. Raymond Simard (Saint Boniface, Lib.): Thank you very much, Mr. Chair.

Thank you for being here this afternoon, and thanks for your patience, by the way, with all the disruption.

It's often very difficult to measure the public policy benefits of your organizations. You sometimes can't measure that benefit, or whether or not the public got their money's worth by whether or not you're financially self-sufficient. I think that's a very important point to make.

From what I saw in our last visit out west, I believe our public is getting their money's worth. Monsieur Vincent hit the nail right on the head when he said you can't build half a car. Once we have committed to the capital expenditures, we have to commit to the long-term operating costs. It doesn't make any sense for us not to do that.

Now, I'd like to know, since CFI and NSERC and these funding organizations provide only 3% of your funding—sorry, it's only 3% of what they provide—whether you feel that there should be a separate structure for big science. In other words, should there be a budget within the industry department to fund big science projects—because they are quite different—or are you convinced that the peer review that comes with these funding organizations is important?

Dr. Martin Taylor: I'll just take the last point first. I think the peer review is absolutely critical. I don't think any of us sitting at this table would expect to be putting a cap out to have federal dollars poured into it without a performance review.

Hon. Raymond Simard: Could you have that peer review outside of these funding bodies?

Dr. Martin Taylor: Yes, absolutely, and there are plenty of precedents for that. The TRIUMF example that I talked about has a blue-ribbon panel that's specially brought in every five years to review the next annual plan and determine, based on past performance, whether further funding should be brought in. So there are models there, absolutely.

Should it be outside or within the existing councils? I could make an argument either way. I don't think that's the issue for us. I think what we want is a fund that is specially targeted towards these very special and selected high-level operational issues. If it's administered through NSERC because that's seen to be the most appropriate channel, so be it; if it's administered outside of it, as is true for TRIUMF at the moment, so be it. That, I think, is a secondary issue. It's having the mechanism in place that recognizes that it's important.

Hon. Raymond Simard: Go ahead, Dr. McDonald.

Dr. Art McDonald: If I could add to that, I agree with everything Martin said.

I think it's important to recognize that these larger-scale projects, which will only be a small fraction of the total, can have significant impact and therefore should be a part of our overall set of things that we're doing in the country, but there are questions that set them aside from the more normal scale of projects that you're dealing with.

When you're trying to make the decisions in the first place—because very often there are large amounts of money, which are often intergovernmental in terms of support that's required, but are also, in many cases, interdisciplinary in their support—you then have a question, when you start to build such a large facility, of whether you are able to build this facility that is at the very cutting edge and of its nature, therefore, has uncertainties as to whether you can achieve what you are attempting to achieve within the original estimates of what it is going to cost. You need to have overview during the construction phase and commissioning; then, when you go into operation, you need to have a mechanism that's been identified in the first place as to how you will be covering these costs. A separate thing could be very valuable.

Finally, you have to know when these projects have finished their worth and are going to be shut down, because they have become an institution at that point. Therefore, setting them aside by having a mechanism that could be working within existing agencies or could be completely separate is the thing that's essential for this small subset of things that are going to be of a large scale but at the cutting edge.

● (1325)

Hon. Raymond Simard: One of the things I think we all recognize is that they draw world-class people to Canada. I had the pleasure of spending a day on the *Amundsen*, the icebreaker, and phenomenal people were working there from pretty well every country in the world. We were in western Canada, and the NEPTUNE project is one that interests me as well.

I didn't hear you say, Dr. Taylor, anything about tidal power or alternative energies. It seems to me that some of your organizations are very well positioned to do some of this stuff, and you're not doing it. I'm wondering why.

Dr. Martin Taylor: We're just in the process of developing a major application that would be linked to NEPTUNE on exactly that. CFI has established a new competition that is entertaining proposals this fall, and there will be a proposal led by the University of Victoria on wave and tidal energy.

The Chair: You've got about a minute and a half left.

Hon. Raymond Simard: Oh, do I?

The Chair: I've been a little lax on time today, as people have noticed.

Dr. Art McDonald: If I could make a comment, we would love to have you come two kilometres underground into a laboratory that is as clean as, or cleaner than, a hospital operating theatre, in an active mine where Vale Inco is taking thousands of tonnes of ore per day, and we're coexisting with them and doing great science in the process. Come and visit.

Hon. Raymond Simard: Unfortunately, we haven't had the opportunity. It would be interesting.

One of the questions that were posed on our visit was whether Canada should be competing with, for instance, a synchrotron. Why should we have a synchrotron when there are seven or eight in the States, and they're all over the place? Why is it important for us to have one when people can go elsewhere?

Dr. Pekka Sinervo: The issue around what Canada should be involved in and what it should not is actually a key question around where Canada's priorities are. If you actually look at the basis on which each of these projects was chosen and selected, however, they actually come back to the question around critical mass and excellence and potential for making contributions at an international level.

We have a synchrotron light source because we have a very strong group of scientists within Canada who are actually doing some of the best science in the world, and they need those synchrotron facilities. They were in fact forced to go offshore, and we were having a very difficult time in being able to support that group and to have it grow. It was a very strategic decision that we had to have our own facility, a facility that we could direct, so that we could actually plan for going forward. It served—

Hon. Raymond Simard: You'd keep your brain power here.

Dr. Pekka Sinervo: That's right.

The Chair: Thank you, Mr. Simard.

We'll go to Mr. Norlock, please.

Mr. Rick Norlock (Northumberland—Quinte West, CPC): Once again, gentlemen, thank you very much for remaining while we go through the throes of our active democracy.

For the benefit of folks who may be listening in, they're hearing about some of Canada's premier projects, which you gentlemen have been highlighting. I think it's necessary to also mention that through the Canada research chairs program there are some 2,000 different projects throughout this country, so some of what you're saying, of course, is relevant to yours, but it is also relevant to others.

We also learned, through the course of your attendance here and through some publications, that Canada is one of the leading countries in terms of its public investment into research and development. I suppose it's a carry-over—not going in the same direction, but similar to what my friend here said about governments having an obligation to do a lot of things and your being one component. But I think it's a major component.

We still have to take care of our elderly, our sick, and infirm. We have to do all those things that governments do. We also have to think to the future, and where I see you and what you do is not only in our present but in our future. But I would like to bring everything into relevance.

I think it's one of the throes we're going through in our country right now. How do we convince the person who pays the freight that it is necessary to allocate the additional resources in a country where the taxpayer thinks they're being overtaxed?

Perhaps I'll help you a little bit, but I would like you to make some comments.

When we talk about astronomy, folks think that if you can afford it, you do it, or that it's a good pastime. But we all know, with the Phoenix Mars Lander and with our exploration of space, that there are a lot of practical applications right here on earth that go to saving lives.

I think people need to know some of the numbers. For instance, I'd like you to comment on the fact that we're looking at a planet that is undergoing some very difficult strains, and of course, there are $230 million allocated to ecoENERGY technology initiatives. I'm wondering if some of those research funds might flow towards you gentlemen. I'd also like you to comment on the over half a billion dollars going to the Canada Foundation for Innovation.

But again, I'd like you to comment—in particular, Mr. Sinervo—on how I, as a member of Parliament, can convince Canadians that their investment in the Phoenix Mars Lander is good for them, not only from the standpoint of the folks who put together the things that went into the exploration vehicle that went to a foreign planet, but in how that translates into how they go about their everyday lives.

● (1330)

The Chair: Okay. There are some big questions there.

Mr. Sinervo, do you want to start?

Dr. Pekka Sinervo: I'll start and then just come back to the Mars rover question.

Clearly you don't do a rover project because of the spinoffs; you do it because that's actually the only way you're going to be able to learn about our world in a way that we haven't been able to before. It's extraordinarily important to understand in the broad context what is happening on other planets.

Is there life on Mars? That's been a major initiative and focus around all of the exploration on Mars and it will continue to be. There is a lot of speculative and very interesting stuff happening. But if you actually pull off a few layers you realize, in fact, that people are looking at Mars not just because of whether there's life on Mars, but because it's actually another climate that doesn't have any asporogenic effects and is driven by some of the same things as our earth's climate is driven by, and it provides an opportunity for us to learn more about what's happening on our own planet by being able to compare and contrast.

Those are the sorts of questions you can ask only by actually going and doing this discovery science—and it is discovery. At the ultimate level you really are talking about whether Canada should be involved in discovery science or not. If you say yes, then the country should decide how much it should be involved in, and it should prioritize and make the commitments that are going to ensure it will be successful.

The Chair: Thank you.

Mr. McDonald wants to comment.

Dr. Art McDonald: Let me give you another example of why it is necessary to have basic science in order to make progress in technological areas.

Simply take computers. For 30 years we have been dealing with what's called Moore's law; that is, the capability of a computer doubles every 18 months, roughly. The reason that's been happening is because the scale of the structures on the silicon—and it has been essentially all silicon that you're dealing with—gets smaller every 18 months. You make them smaller, the distance between them is decreased, they are faster, and you are able to store more. That's essentially what's been happening in that technology.

Within the next 10 years, you will be in a situation where you have reached the size of the silicon atom. You cannot go any further with that particular technology in terms of what has been, really, one of the major revolutionary things that have changed our society over the last 30 years. You have to go to something that deals with things at the atomic level. You have to get into quantum and nano objects. And no one knows what the next technology is going to be that enables that computer progression to take place.

Who are the people capable of doing it? It's the people who understand quantum mechanics, the people who understand what happens when you get to the quantum level of interactions of things in various materials. It may be something different in a revolutionary way from silicon. But if you don't have that mix in your country of people who are capable of understanding how to exploit, given the basic knowledge, and the people who are pushing the basic knowledge, working together, you're not going to be able to make the sort of progress when you run up against those sorts of questions that are not just expanding the technology, they're expanding your understanding of how the world works.

● (1335)

The Chair: Thank you.

Mr. Taylor, is it essential? Very, very quickly.

Dr. Martin Taylor: I just want to say that CFI, when it funded each of the programs that we represent, required us to state very clearly what the benefits for Canada and Canadians were of that investment. That's written into our original proposals. A key part of that for us, with NEPTUNE Canada, was the applications to these various areas of public policy as well as public outreach that I've spoken to earlier. The onus is on us, and I take the point absolutely of being proactive in communicating how those benefits are translating. It's not enough to put it in an original application. You have to follow through, demonstrate it, and communicate it.

The Chair: Thank you.

We'll go now to Mr. Telegdi.

Hon. Andrew Telegdi: Thank you very much.

Actually, the question came up, how do we convince taxpayers? The reality is that for that little machine there are over 10,000 employees, and not all of them have gone to university. There is the production side, putting these machines together.

I'm glad you mentioned quantum computing, because IQC is in Waterloo and it points to a number of things. They were able to attract a critical mass, and in the case of Dr. Raymond Laflamme, who is actually a Canadian who was down in Texas, he was brought back to head IQC. Mr. Laflamme is at the top of the whole quantum industry. He was Hawking's star student.

They have put together a critical mass around this, and we're leaders right now in this technology. But the rest of the world is starting to focus on it. So unless we continue to be leaders and we build on what we have, we can lose it to somebody else. The potential for quantum is so huge, it would be a paradigm shift. Dick Tracy's world is what you're essentially talking about once you get into that miniaturization, where you actually harness the positives and negatives in the atom. It's mind-boggling. But if we do manage to be at the forefront, the kind of job creation that leads to, and the wealth it leads to as well, is huge.

So the question for government is that we're at the forefront in this research; are we going to build on it? Are we going to stay at the forefront? There are absolutely no guarantees that we will be the ones who will benefit from it, but we have a good chance of doing so. Just as with any other research that we engage in, it touches all sorts of people who never go to university.

As one thing more in terms of the climate for promoting science, Kitchener-Waterloo is known for its Oktoberfest. A couple of years ago we had EinsteinFest, which came around the same time as Oktoberfest, celebrating Einstein's 100th birthday. It was huge. The popularity and the number of people who went through there was just amazing. People actually came in and got really excited by science. Yes, there's a real need for scientists to explain what they do, but it can be incredibly exciting.

Getting back to the panel, I think what we have to be keen on is being niche researchers. We can't do everything, and you said that. We have to identify what we're good at and where it makes sense to invest to keep it going. It doesn't do much good to throw tens of millions of dollars, or hundreds of million of dollars, at it and then abandon it. Once we make that commitment, it really is important that we go through with it, along with the peer review to make sure we're on track.

● (1340)

The Chair: Mr. McDonald.

Dr. Art McDonald: I just spent a fascinating hour listening to Ray Laflamme as he received a top prize from the Canadian Association of Physicists at their conference in Quebec City earlier this week. So I understand exactly what you mean about this particular individual.

I think the sort of thing that attracts that type of person to the country, who will work at the frontiers of basic science, is the ability to offer them the sorts of facilities that we're talking about in certain niche areas, as you put it, that have been selected appropriately by peer review teams as being the things that Canada can be excelling in. What you mentioned in terms of quantum computing is one of them, I think, personally and self-serving, but the ones that are being discussed here at the table are others. I think our ability to push the forefront in a wide variety of areas at the very basic level is going to be important for our competitiveness, as it is in this particular example that we're dealing with of quantum computing.

The Chair: Mr. Taylor, did you want to comment?

Dr. Martin Taylor: I just want to indicate that there are two venues where I think advertising, in the best sense of the word, to the world where we are leaders is happening. One is in Beijing right now in terms of the lead-up to the Olympics and through the Olympics. Canada, as you know, is exhibiting there, and exhibiting amongst other things its science and technology. Within that, NEPTUNE Canada is being showcased, because it's putting us in a lead position internationally.

In 2010, we host the Winter Olympics right in British Columbia. We're in active discussions right now as to what areas of science and technology we want to showcase to the world as demonstrations of Canadian leadership, and NEPTUNE will be there.

The Chair: Thank you.

We have Madame Brunelle, and then the chair will have the final question.

[*Translation*]

Ms. Paule Brunelle: Thank you.

What this committee really wants is to hear science and technology success stories. That would be a stimulating experience. I was interested to learn upon reading the submission of the Coalition for Canadian Astronomy that Softimage, a leading software design company, was developed by two researchers from the Observatoire astronomique du Mont-Mégantic in Quebec.

As I see it, the current debate on how to convince taxpayers of the benefits of funding this field speaks for itself. You mentioned other examples, including that of Dynamic Structures which has created a business that has generated revenues of several hundred million dollars. These are very compelling examples.

Is there not a need first and foremost for a structure that would better promote your major accomplishments? Perhaps you would like to talk to us about the successes in your respective areas. That's what we need to hear to convince taxpayers that everyone benefits from research activities and industry spinoffs.

[*English*]

Mr. Guy Nelson: We actually saw that problem. As a business person, and actually just having joined the astronomy envelope in the last year, we acquired the company called Dynamic Structures a year ago. We've committed to creating an industry-wide video for general public consumption, because we felt we weren't connecting with people on the successes we had developed as an astronomical community both on the industrial side and in the bodies and the lives that we had touched.

The reason it went that way was that we were awarded the use of a new 3-D software called Inventor in the design of TMT. Microsoft brought us down to 10,000 users in Las Vegas and gave us an award there for the use of that software, for pushing the envelope on this particular one. We were using 4,000 tonnes of steel in developing that, taking that particular software where no one had taken it before.

So it's exactly that point we felt we were missing, and particularly in the International Year of Astronomy—next year, 2009—it was a good time to speak about the successes we've had and to build that groundswell beyond just the people who have astronomy as a hobby through to the professional astronomers. So we are doing that, and my company is actually leading that with about half a dozen others across the country who felt that was missing.

The Chair: Mr. Taylor.

● (1345)

Dr. Martin Taylor: In the fields we're talking about, modesty is not a virtue. And in part, I think we've had a problem with being far too modest as a country, and I think that extends to our science and technology achievements.

You're right to put the question back to us. Where are we in terms of being proactive in our communication planning and communication strategies to make sure the success stories that we're all relaying today are not just being relayed around this table, that they're being relayed to the public at large in the venues where they can best be heard? I take that as a challenge very seriously, and it's built into the planning for NEPTUNE Canada and for its sister observatory, VENUS.

As I've said, we have special opportunities because we are going real-time onto the Internet, but that can't be taken for granted either. People have to know and want to access that, given the saturation of information that's out there.

So clearly it takes a special effort and a proactive plan to make sure that indeed these success stories get out there and that we work closely with the media. And has been mentioned, Peter has been a great supporter of us, as have others. NEPTUNE Canada had a terrific story just a couple of weeks ago on the front page of the *Ottawa Citizen* indicating some of the early successes, particularly on the VENUS system.

Those plans are in place, but I accept entirely that the onus is on us to make sure those success stories are not buried.

The Chair: Thank you.

Mr. McDonald, go ahead briefly.

Dr. Art McDonald: I also accept that responsibility. We accept that responsibility.

We are working with Science North, which not only develops things for Sudbury, but also develops theatres that can be sold around the world. Those are examples of things it has done. It does IMAX movies. It has that capability here in Canada. We're working with it to develop a future project that potentially is internationally saleable, which is in this area of science that we've been talking about and emphasizing, particularly in underground science and the related field of astronomy.

The Chair: Thank you.

Merci, Madame Brunelle.

I'm going to use the chair's prerogative to ask the final question.

One of the biggest issues the committee is going to have to address is the operating funding issue. Mr. Taylor, I liked the way you outlined the three parts of this: there's capital funding, operating funding, and experimental funding. The capital funding issue, largely through CFI, has been addressed. The experimental funding, through granting councils, has largely been addressed. As for operating funding, there are indirect costs for research institutions, but I think that both you and Mr. McDonald and the other big science project people are correct in saying that this funding is not available for big science projects. So you have a gap there for operational funding.

It's a valid point, but as you know, it's always a tough sell for any committee or group of persons to go to the government and say we ought to institute a new program or have further government spending in this area.

You're experts in this area. Could you perhaps provide some details to the committee on what the program would look like? Could you give us an estimate at to what costs we'd be looking at, how the program would operate, and some details? The committee can recommend something general, such as by saying that we need something to address operational funding, but I think it would be better if the committee had something more specific to propose to the government, so that the government could really have something they could consider.

Dr. Martin Taylor: If you're making that an invitation to us—

Mr. James Rajotte: Absolutely.

Dr. Martin Taylor: —to follow up with that level of detail, we would gladly accept that and work together to do that. I think the thing I should say is that we have had the opportunity in advance of today to exchange views, so we are talking to you as a collective as much as we are in terms of our individual interests. So we would be very, very happy to provide you with our own thoughts on both the magnitude of the challenge as well as the mechanisms whereby that might be resolved.

The Chair: Thank you.

Mr. McDonald.

Dr. Art McDonald: I would say that we're very willing to do that and we'll come back to you with some more specifics.

The broad-based things that we can say today are, number one, that it is broadly acknowledged that the operational costs for large capital facilities, as was said by Mr. Taylor earlier on, are roughly 10% per year; that is, 10% of the capital expenditure is required per year for the long-term operation. Secondly, it's important that in this case there is a good peer review mechanism, and it's also very important that there is some stability and a look ahead at the longer term in order to enable the management of these facilities to do planning.

So the detailed mechanisms within the existing framework could be some combination of existing agencies, but those things have to be a part of what you're dealing with in the longer term.

● (1350)

The Chair: Thank you.

Mr. Sinervo.

Dr. Pekka Sinervo: I agree completely with Dr. Taylor and Dr. McDonald on the overall framework.

My only other comment is that committee should not be afraid of the concept of accountability within the scientific community.

A voice: Absolutely.

Dr. Pekka Sinervo: That is something we live with every day. We live and die on the basis of peer review, on the basis of the success or failure of our experiments. That has to be an element of any ongoing program to support these sorts of projects.

The Chair: My time is running short, but I have a very troublesome question that was given to me by Ray Simard and that I'm going to put to you. You can offer a yes or no answer, or you can follow it up. It was a good question.

He asked, is there ever an end to the big science projects, or do you just continue to build, just as SNOLAB was built on what was done before? Is there ever a point at which you say, we've done what we've done in this area and there's no reason to continue?

Dr. Art McDonald: I'll give you a concrete example. The Sudbury Neutrino Observatory borrowed $300 million worth of heavy water for use in its facility. We have met all of our scientific objectives and, as of last year, we returned that money. We now have a facility that has significant capabilities, and we have identified a future use of it—but for different science. We are perfectly happy to be peer reviewed on that.

I think this enables me to reiterate something that I said before, which is that if you're going to deal with big science facilities, whereas operations right now are the problem for them, you should have a mechanism that decides in the first place what is the best of the new facilities being forward, that deals with the construction and the commissioning, and then deals with the operations, but finally, one that also asks these facilities continually to be accountable for whether or not what they're doing is still relevant and whether they have already met their objectives.

We have no problem with being accountable. We do it yearly to our peers, and we're happy to do it in this case.

The Chair: Thank you.

I'm out of time, gentlemen, but perhaps you want to give a yes or a no.

Dr. Martin Taylor: Yes, we have to make choices, but we have made some critical choices for the right reasons and now we have to follow through on them.

The Chair: Okay.

Dr. Pekka Sinervo: On the astronomical facilities that Canada has invested in, there have been four generations of facilities. We're not running those old facilities any longer, and we don't expect to be running the current generation 10 years from now.

The Chair: Thank you.

I want to thank you for your time and for being very patient with the two votes we had in the middle of the session.

It was a very interesting session. If there is any further information you may want to add, especially with respect to some of the questions, please submit that to me or the clerk, who will ensure that all members get that information. Thank you, again, for your time.

Members, we have a few housekeeping items before we go to question period, so we'll let the witnesses take their leave and we'll deal with those items.

First of all, as an update, the services sector report will be tabled in the House of Commons this Tuesday. There will be a press conference. It is scheduled for Tuesday, at 10:15 a.m., after the presentation of the report in the Charles Lynch room. We have seven passes to get into the room. We will have, in order, the chair, the vice-chair, the second vice-chair, Ms. Nash, and then the parliamentary secretary, who will present in a press conference. That's Tuesday, right after the presentation.

The other issue is that we do need a subcommittee meeting. It was going to be for 10 a.m. on Tuesday, but obviously we can't do it during the press conference. Mr. McTeague is suggesting Monday night at 6 p.m., and he promises to buy us all dinner.

Hon. Dan McTeague (Pickering—Scarborough East, Lib.): I promise to buy you all dinner.

[*Translation*]

Ms. Paule Brunelle: Monday evening at 6 p.m.?

Hon. Dan McTeague: No doubt most of us will be here. I know I will.

Ms. Paule Brunelle: I will be in the House.

Hon. Dan McTeague: What about a little later then, Mr. Chairman?

[*English*]

The Chair: How about five o'clock?

[*Translation*]

Ms. Paule Brunelle: After the House rises.

Hon. Dan McTeague: At 7:30 p.m.?

Ms. Paule Brunelle: The House rises around 6:30 p.m.

[*English*]

The Chair: We'll finish at 6:30 or 7 o'clock.

Ms. Paule Brunelle: Around 6:30 or 7 o'clock.

[*Translation*]

Hon. Dan McTeague: Then after the House adjourns, around 7 p. m.

[*English*]

The Chair: Okay, does that work, 7 p.m. to 8 p.m. on Monday? We'll find a room.

We need to decide on the travel, and we also need to decide on Bill C-454 in terms of the timing of the work plan.

Mr. McTeague, you wanted to make a point on energy.

● (1355)

Hon. Dan McTeague: Chair, more headlines this morning are suggesting that a barrel of oil will be at $250 by December. Energy costs are going through the roof. I realize that we have set a date of August 27 to discuss this urgent matter, and we may be able to dovetail it with Bill C-454. I'm suggesting that if it is at all possible, with consent, we as a committee try to at least give a couple of hours to what is a growing concern.

I don't know if it's speculators on the markets or if it's in fact rabid competition for scare resources that's driving this, but clearly there has been no Canadian response, very little in the way of anything by this committee, and certainly nothing from a governmental point of view, addressing what I think is the most critical issue facing the country, regardless of where we are in the political spectrum.

I leave it to the committee that we try to have at least a day well before that. I realize that some of us have great obligations, but if we could at least find a day well before August 27, which is about two and a half months from now, I suggest we try to delve into that for at least a day. I realize it's very onerous on members, but I think all of us are getting the letters; all of us are getting concerns.

As for the issue of Bill C-454, we're prepared to go as soon as possible, even if that means sitting during the summer.

The Chair: Thank you.

Mr. Van Kesteren.

Mr. Dave Van Kesteren: Mr. Stanton has left, but I know some of us have made some commitments for the summer. I'd want to check on those first before we decide something.

I'm suggesting that maybe we could have an opportunity to look at our schedules and then report to whoever will be at that subcommittee and let the subcommittee make that decision.

The Chair: That would be on Monday night.

Is that okay, Mr. McTeague?

Hon. Dan McTeague: That's fine, Mr. Chair. Thank you.

Thank you, Mr. Van Kesteren.

The Chair: Go ahead, Madame Brunelle.

[*Translation*]

Ms. Paule Brunelle: That will be very difficult for me. I have a very tight schedule until the end of August. However, I am prepared to discuss this in the subcommittee. It won't be easy, though.

[*English*]

The Chair: The last item I had, members, was operational budget requests in conjunction with our study on science and technology in Canada. You have it before you. The amount requested is $39,750.

Mr. McTeague, do you want to move this?

Hon. Dan McTeague: Chair, I'll move that the committee approve the operational budget request of $39,750. Is that correct?

The Chair: Yes. Thank you.

Mr. Telegdi, do you have a question?

Hon. Andrew Telegdi: I just have a suggestion that at some point you folks look at going to Waterloo.

The Chair: We will be. We're going in September.

Hon. Andrew Telegdi: Oh, good.

Might I suggest to you some places you might go once you get to Waterloo?

The Chair: Actually, if you have any suggestions, please submit them to the clerk. We're considering the second part of the travel at subcommittee on Monday evening.

Hon. Dan McTeague: Chair, it's very important, given that Mr. Telegdi has suggested we be there, that Mr. Telegdi also be responsible for the logistics as well as the payment of the meal for our presence there that evening.

An hon. member: Hear, hear!

The Chair: All in favour?

Some hon. members: Hear, hear!

The Chair: All in favour of Mr. Teague's motion to accept the operational budget, please signify.

(Motion agreed to)

The Chair: Have a wonderful weekend, ladies and gentlemen.

The meeting is adjourned.

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