RÉGIE DE L'ÉNERGIE

DEMANDE D'HYDRO-QUÉBEC DISTRIBUTION
POUR RÉALISER LE PROJET LECTURE À DISTANCE
PHASE 1

DOSSIER : R-3770-2011

RÉGISSEUR : Me RICHARD LASSONDE, président

AUDIENCE DU 17 MAI 2012

VOLUME 16

CLAUDE MORIN ET JEAN RIOPEL
Sténographes officiels

COMPARUTIONS

Me PIERRE TOURIGNY
procureur de la Régie;

REQUÉRANTE :

Me JEAN-OLIVIER TREMBLAY
Me MARIE-JOSÉE HOGUE
procureurs de Hydro-Québec Distribution (HQD);

INTERVENANTS :

Me STÉPHANIE LUSSIER
procureure de Association coopérative d'économie familiale de l'Outaouais (ACEFO);

Me DENIS FALARDEAU
procureur de Association coopérative d'économie familiale de Québec (ACEFQ);

Me SERGE CORMIER
procureur de Association des redistributeurs d'électricité du Québec (AREQ);

Me ANDRÉ TURMEL
procureur de Fédération canadienne de l'entreprise indépendante (FCEI);

Me GENEVIÈVE PAQUET
procureure de Groupe de recherche appliquée en macroécologie (GRAME);

Me ÉRIC DAVID
procureur de Option consommateurs (OC);

Me FRANKLIN S. GERTLER et
Me JACYNTHE LEDOUX
procureurs de Regroupement des organismes environnementaux en énergie (ROEÉ);

Me ANNIE GARIÉPY
procureure de Regroupement national des conseils régionaux de l'environnement du Québec (RNCREQ);

Me DOMINIQUE NEUMAN
procureur de Stratégies énergétiques et Association québécoise de lutte contre la pollution atmosphérique (SÉ-AQLPA);

Me RICHARD BERTRAND et
Me LOUISE-HÉLÈNE GUIMOND
procureurs de Syndicat des employés-e-s de techniques professionnelles et de bureau d'Hydro-Québec, section locale 2000 (SCFP-FTQ);

Me HÉLÈNE SICARD
procureure de Union des consommateurs (UC);

Me MARTINE BURELLE et
Me STEVE CADRIN
procureurs de Union des municipalités du Québec (UMQ);

TABLE DES MATIERES

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L'AN DEUX MILLE DOUZE, ce dix-septième (17e) jour du mois de mai :

PRÉLIMINAIRES

LA GREFFIÈRE :

Protocole d'ouverture. Audience du dix-sept (17) mai deux mille douze (2012), dossier R-3770-2011, demande d'Hydro-Québec Distribution pour réaliser le projet Lecture à distance - Phase 1. Poursuite de l'audience.

LE PRÉSIDENT :

Bonjour à tous et à toutes. Bonjour, Doctor Carpenter, j'imagine. Je vais vouloir vérifier notre emploi du temps aujourd'hui et demain. Mais avant ça, est-ce qu'il y a des questions préliminaires?

Me GENEVIÈVE PAQUET :

Bonjour, Monsieur le Régisseur. Geneviève Paquet pour le GRAME. J'ai transmis une correspondance le onze (11) mai deux mille douze (2012) suite à la, en fait à la correspondance du Distributeur qui était du neuf (9) mai, puis c'est par rapport au sujet de la contre-preuve et puis...

LE PRÉSIDENT :

Oui, oui, j'ai vu ça. Je peux peut-être régler une partie de ce que vous demandiez là-dedans. D'abord, le Distributeur s'est engagé, je pense, vis-à-vis l'UMQ s'il y avait des documents qui étaient produits en contre-preuve qu'il allait les produire d'avance. Ça, ça répond à une de vos préoccupations. C'est sûr que sur la contre-preuve, vous allez avoir le droit de contre-interroger les témoins du Distributeur. Et c'est votre décision de savoir si vous avez besoin d'être accompagné de votre expert, monsieur Finamore, pour ce faire.

Pour ce qui est de la question du contenu de la contre-preuve, la question de savoir si c'est nouveau ou pas, je ne pense pas que le... je pense qu'on va... on regardera ça quand on arrivera à la contre-preuve. Si vous pensez qu'il y a des éléments de la contre-preuve qui sont, qui ne devraient pas être présentés, bien, vous ferez une objection puis j'en traiterai.

Mais je peux tout de suite vous dire que vous avez raison de dire qu'en contre-preuve, là, ça porte sur les éléments nouveaux qui ont pu être apportés par des intervenants. Je vous ferai remarquer cependant, là, que même devant les

tribunaux civils, il y a une certaine discrétion qui est accordée au juge. Et, ça, ça tient au dernier paragraphe de l'article 289 du Code de procédure civile. C'est un principe qui est reconnu par les auteurs.

Alors, lorsque la preuve d'un intervenant contredit celle du Distributeur, la Régie, je dirais, a encore plus de discrétion que les tribunaux civils parce qu'on n'est pas une cour civile ici, on est un organisme de régulation économique puis on a des pouvoirs d'enquête en vertu de l'article 35. En d'autres mots, lorsqu'un participant dit blanc puis un participant dit noir, la Régie n'est pas tenue de rester dans le gris. Alors, je peux poser des questions, surtout si c'est sur des éléments qui sont importants pour la décision que je dois rendre.

Alors, cela étant dit, ça met le cadre. Mais si vous pensez que, lors de la contre-preuve, il y a des choses, vous pourrez vous objecter puis on traitera des objections une par une. D'accord?

Me GENEVIÈVE PAQUET :

D'accord. Par contre, nous, ce qu'on proposait, c'était effectivement, c'est que si le Distributeur était disposé à peut-être nous donner le contenu de

la contre-preuve pour qu'on puisse en faire part à notre expert pour lui éviter de revenir. Si on n'est pas en mesure d'avoir le contenu, effectivement, on va demander à monsieur Finamore de revenir. Par contre, il n'est pas disponible cette semaine ni le vingt-deux (22) mai. Ses disponibilités, comme je vous informais, ça va commencer autour, deuxième partie du mois de juin, autour du vingt (20) juin. Donc, c'était pour ça qu'on essayait d'avoir peut-être un certain début d'information pour éviter qu'il ait à revenir. Je ne sais pas la position du Distributeur par rapport à ça.

Me MARIE-JOSÉE HOGUE :

Écoutez, je peux voir avec maître Paquet ce qu'on peut... L'intention, c'est de déposer ce qui sera présenté lors de la contre-preuve et de le déposer à l'avance. Alors, je pourrai parler avec maître Paquet pour m'assurer qu'elle a effectivement accès le plus rapidement possible à cela, puis elle pourra le transmettre à son expert si elle pense qu'il y a des commentaires qui sont nécessaires.

LE PRÉSIDENT :

Puis si, après avoir pris connaissance de ces documents-là en contre-preuve et les avoir montrés

à votre expert, si vous jugez qu'il est nécessaire de passer d'un contre-interrogatoire avec l'expert, bien, là, on est accommodant, on va trouver une façon de régler le problème.

Me GENEVIÈVE PAQUET :

O.K.

LE PRÉSIDENT :

Je ne veux pas vous empêcher de faire une preuve ni de contre-interroger.

Me GENEVIÈVE PAQUET :

D'accord. Merci, Maître Lassonde. Seul petit bémol, c'est que, là, on parlait du vingt-deux (22) mai. Là, on est le dix-sept (17). On n'a pas encore eu accès aux documents. Donc, il va falloir peut-être tenir compte de ça dans le calendrier.

LE PRÉSIDENT :

Bon. Je peux-tu vous suggérer, parlez-vous-en donc aujourd'hui. Là, aujourd'hui, on en vient à notre propos. On doit... Avez-vous d'autre chose à... Non. Alors, je pense que c'est des questions que vous pouvez discuter avec maître Hogue. Vous allez sûrement trouver une façon de vous entendre. D'accord?

Me GENEVIÈVE PAQUET :

D'accord. Merci.

LE PRÉSIDENT :

Merci. L'emploi du temps aujourd'hui et demain, je pense, Maître Neuman, vous avez besoin, vous, de combien de temps pour... D'abord, aujourd'hui, on entend le docteur Carpenter et madame Beausoleil du ministère de la Santé, Services sociaux. Vous, vous avez besoin de combien de temps pour la présentation en chef du docteur Carpenter?

Me DOMINIQUE NEUMAN :

Bien, écoutez, ça pourrait être de l'ordre de deux heures. Mais une question préalable pour laquelle je n'ai pas encore eu de réponse : Est-ce qu'Hydro-Québec conteste le statut d'expert du docteur Carpenter? Puisque je n'ai pas eu de correspondance ni pour dire oui ni pour dire non. Donc, je ne le sais pas.

Me MARIE-JOSÉE HOGUE :

Ça dépend expert en quoi. Je pense que ça dépend de la qualification qu'on veut lui donner. Et ce que je suggère, c'est qu'il y ait, que maître Neuman débute pour établir quelles sont ses compétences, puis on verra à partir de là quelle sera sa demande.

LE PRÉSIDENT :

D'accord.

Me DOMINIQUE NEUMAN :

Donc, je vais présenter le curriculum vitae. Enfin, monsieur Carpenter va présenter son curriculum vitae au préalable. La désignation exacte de la reconnaissance d'expert se trouve dans la demande que j'ai logée il y a quelques jours. Je suis en train de la faire sortir sur mon ordinateur pour avoir les mots exacts qui sont à a requête.

LE PRÉSIDENT :

Je reviens à mes problèmes d'intendance. Je veux juste... Vous avez dit deux heures pour le témoignage en chef...

Me DOMINIQUE NEUMAN :

Plus le c.v. Plus la description de son curriculum vitae.

LE PRÉSIDENT :

Allons-y! Est-ce que... Maître Hogue, est-ce que vous avez des questions pour le docteur Carpenter?

Me DOMINIQUE NEUMAN :

Je vais d'abord...

Me MARIE-JOSÉE HOGUE :

Certainement.

Me DOMINIQUE NEUMAN :

... présenter le c.v.

LE PRÉSIDENT :

On n'est pas rendu, on n'a pas commencé, là. Je vais vous faire un grand signe quand on va avoir commencé. Je vais dire : « Allons-y! » On est juste dans l'intendance.

Me MARIE-JOSÉE HOGUE :

Certainement, j'aurai...

LE PRÉSIDENT :

Vous avez des questions. Combien de temps à peu près?

Me MARIE-JOSÉE HOGUE :

Bien, écoutez, c'est difficile...

LE PRÉSIDENT :

Ça dépend des réponses.

Me MARIE-JOSÉE HOGUE :

... sans savoir ce qu'il va dire même en chef. Je vous dirais que c'est certain que j'en ai au moins pour deux heures.

LE PRÉSIDENT :

O.K.

Me MARIE-JOSÉE HOGUE :

Et peut-être plus si...

LE PRÉSIDENT :

Bon. J'ai compris aussi que madame Beausoleil avait une courte présentation à faire. Donc, je pense

bien qu'on pourra... Normalement, on devrait être capable d'entendre et le docteur Carpenter et madame Beausoleil aujourd'hui. Demain... Est-ce que le Distributeur est prêt à commencer sa contre-preuve immédiatement après?

Me MARIE-JOSÉE HOGUE :

Oui, on est en mesure de débuter.

LE PRÉSIDENT :

Oui.

Me MARIE-JOSÉE HOGUE :

Bien, dans la mesure où c'est demain enfin, et non pas aujourd'hui. Je pense qu'on a une très bonne journée devant nous.

LE PRÉSIDENT :

O.K. Alors, Maître Neuman, là, c'est parti. Vous avez la parole.

PREUVE DE SÉ/AQLPA

Me DOMINIQUE NEUMAN :

La demande de reconnaissance de statut d'expert pour le docteur Carpenter, et comme témoin expert en santé publique incluant les risques de santé associés à l'exposition aux émissions de radiofréquence, c'est ce qui se trouve écrit dans notre demande à cet effet, qui est la pièce C-SÉ/AQLPA-0062.

LE PRÉSIDENT :

Répétez-moi donc ça lentement. Danger de?

Me DOMINIQUE NEUMAN :

Comme témoin expert en santé publique incluant les risques de santé associés à l'exposition aux émissions de radiofréquence.

LE PRÉSIDENT :

Je voudrais cependant, avant que vous commenciez, là, je rappelle que la preuve du docteur Carpenter, et tout ce qui est relié, que ce soit le contre-interrogatoire ou la contre-preuve, le cas échéant, ça, c'est entendu sous réserve de la recevabilité de ce témoignage-là en fonction des questions de juridiction et des autres questions de droit qu'elle soulève. Et, là, j'entends par des questions de juridiction la question de juridiction sur la santé, les radiofréquences. Les autres questions de droit, j'entends, par exemple, l'application du principe de précaution, et caetera. Alors, ça, je m'attendrai à ce que les participants concernés, en tout cas vous et maître Hogue, en traitiez en argumentation finale.

D'accord?

Me DOMINIQUE NEUMAN :

D'accord. C'était ma question à quel moment nous

devrions en traiter. Donc j'ai ma réponse. Simplement pour signaler que notre proposition n'est pas de modifier les normes de quelque façon que ce soit, je parle des normes de Santé Canada, quel que soit leur statut. Mais de demander à la Régie de l'énergie d'exercer sa juridiction qui a le choix entre...

LE PRÉSIDENT :

Bien, c'est ça. Vous le plaiderez ça en argumentation finale.

Me DOMINIQUE NEUMAN :

C'est ça. D'exercer sa juridiction, de demander à Hydro-Québec de modifier son projet par précaution.

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Dr. Carpenter, good morning. Yes, I'll try to talk, I'll try to ask my questions in English, Maybe if something gets difficult, I'll switch back to French. Is Dr. Carpenter? Yes, so Dr Carpenter is ready to be sworn in?

IN THE YEAR TWO THOUSAND AND TWELVE (2012), on this seventeenth (17th) day of May, PERSONALLY CAME AND APPEARED:

Dr. DAVID O. CARPENTER, public health physician. I

am a professor of Environmental Health Sciences at the University at Albany and I am the Director of the Institute for Health and the Environment at the University at Albany.

WHO, after having made a solemn affirmation, doth depose and saith as follows:

PREUVE SUR LA QUALITÉ D'EXPERT

EXAMINED BY Me DOMINIQUE NEUMAN:

Q. [1] So Dr. Carpenter, first, I will ask you if you recognise the document that was filed as your CV in the present file which is number C-SÉ-AQLPA-0060, SÉ-AQLPA-04, Document 3.

A. Yes I do.

Q. [2] Okay. And also do you recognise your revised report which is C-SÉ-AQLPA-0075?

A. Yes I do.

Q. [3] And the SÉ-AQLPA-07 Document 1.1 and the attached documents that are being filed, that are in the most cases documents mentioned in your report.

A. Yes, the many attached documents.

Q. [4] Okay. So Dr. Carpenter I will ask you to

describe your curriculum vitae, what is your experience and your expertise in the field that we are dealing with today?

A. Well I have had several segments of my career. I attended medical school but I became very interested in basic research during that period of time. I took one year off from medical school, went to Sweden to study basic aspects of the nervous system; came back, finished medical school but decided then that I wished to go into research at least for a period of time rather than practising medicine. In fact, I never went back to clinical medicine, I spent the year after my graduation from medical school at the Harvard Medical School where I graduated doing a research on the brain, then I went to Bethesda, Maryland and became an officer in the U.S. Public Health Service at the National Institute of Mental Health, where again, I did basic research on the nervous system.

I transferred from the Public Health Service to the U.S. Civil Service but then, after seven and a half years at the National Institute of Mental Health, I was offered a position as the Director of the Department of Neurobiology across the street from NIH at the National Naval Medical

Center for the Armed Forces Radiobiology Research Institute. And I was actually recruited there because I was not an expert in radiation, but I was given resources so that I became the head of a basic science department of about fifty (50) people that included everything from chemistry of the brain to physiology of neurons, to studies of brain injury that was obviously of great concern to the Defence Department.

Q. [5] In which year was that?

A. I moved from NIH to the Armed Forces Radiobiology Research Institute in nineteen seventy-three (1973).

Times changed and radiation became more important again and so I increasingly began to do studies and work on problems of ionising radiation. Now during the almost eight years I was at that research institute, I did not personally do any experiments with non-ionising radiation and in fact to this day, what I will discuss today is not my own research. I have never performed research on non-ionising radiation but I've had numerous administrative responsibilities for that subject and, to my judgement, that is a benefit because I don't have ego invested in my own studies, but can

sit back and review them objectively.

During the time that I worked at the Armed Forces Radiobiology Research Institute, there was increasing concern about health effects of microwaves. And again, I didn't personally get involved in the studies, but I was involved in review of those studies.

In nineteen eighty (1980) I was recruited to New York State as the Director of the Wadsworth Center for Laboratories and Research. This is an unusual organisation for a state. The time that I became the Director it had about a thousand (1,000) employees over two hundred (200) that were doctoral level, either Ph.D or MD, and it is the public health laboratory for New York State and the third public, the third largest public health laboratory in the U.S. after the National Institute of Health and the Centers for Disease Control.

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The reasons that they found me attractive for that position at that time really...

LE PRÉSIDENT :

Vous regardez en arrière, qu'est-ce qui vous préoccupe?

Me DOMINIQUE NEUMAN :

Non, non, je voulais simplement vérifier si quelqu'un était arrivé, c'était simplement ca. Je m'excuse.

A. The reasons that I was recruited for that position were two. The public health emergencies in New York State at that time were Three Mile Island, which was an ionizing radiation issue, and I had by that time considerable background in ionizing radiation. And the other was Love Canal, which was the first hazardous waste site for which there were issues of human health exposure to chemicals, which in fact was more closely related to my personal research.

I arrived in Albany in the first (1st) of March in nineteen eighty (1980), and two weeks before I arrived, there had been a settlement over a dispute between two New York State agencies, the New York State Public Service Commission and the New York State Power Authority. And this dispute was over whether there were health hazards from high voltage power lines. There was a power line bringing Canadian hydroelectric power into New York; across the border at Massena, there was a seven sixty-five (765) kV power line that terminated at Marcy, New York, in central New York

State. And while there had been to that point little scientific research around health... adverse health aspects of power line frequency magnetic fields, electric or magnetic fields, there were individuals that raised those concerns, particularly land owners, where the power line crossed their property.

I was given the responsibility of administering that program for New York State. Now, this was totally an addition to my major responsibilities, which were to direct this one thousand (1,000) person laboratory as well as to continue my own research program, which was primarily focused around nervous system effects. We designed the program trying to keep a certain distance from State government. So it was the New York State Department of Health responsible for administering the program. We identified nine experts that were carefully selected to not have biases, not own stock in utilities, not have public positions on whether or not electromagnetic fields were dangerous. That program then was supported by five million dollars ($5,000,000), assessed from New York State utilities in proportion to their share of the market. And we supported, over that

period of nineteen eighty-two (1982) to nineteen eighty-seven (1987), fifteen (15) different research projects, one here in Canada, and different parts of the U.S. And it was a competitive process. In nineteen eighty-seven (1987), when that program concluded, there was a final report written. And again, I was responsible, not for writing the report, but for administrating it. After that report was made public, I then became the spokesperson for New York State on the issue of adverse health effects from power line, electricity, electric and magnetic fields.

I should say something about the state of the art at that time, and please tell me if I'm talking too long.

Q. [6] No, but when you're saying "at that time", what year are we talking about?

A. Nineteen eighty-seven (1987). Well, I was actually referring to earlier than that. When our program started in nineteen eighty-two (1982), there had been really one scientific publication in a first-rate peer-reviewed journal that alleged that there were adverse health effects from exposure to magnetic fields from power lines. There was a report published in nineteen seventy-nine (1979) by

Wertheimer and Leeper, published in the American Journal of Epidemiology, which is one of the premier journals. And it was a study done in Denver, Colorado, where the investigators looked at the homes of children with cancer, and compared characteristics of the home without ever going in the home, but characteristics of the home in relation to power lines in the street, transformers in the street, substations and that sort of thing, and concluded that a child that lived in a home that had... likely had elevated magnetic fields from the electric appliances in the outside of the home was more likely to develop cancer. And they had statistically significant results, primarily for childhood leukemia, also for lymphoma and brain cancer. These are the three cancers that are most common in children.

Now, I should say, at that time, I was very skeptical of that report. There was no hypothesis even as to a mechanism. I think most good scientists were skeptical of that report. But it was the single most concerning demonstration in the scientific literature at that time, and so we determined that it was essential that in our New York State power line's program, we support a study

that would replicate or test the conclusions from that study. We did that, we recruited a young epidemiologist from the University of Colorado, we did the study in the same city, Denver, Colorado, as the original report. It did not include any of the same children with cancer.

09 h 55

And in addition to using the surrogate measures, how close was the power line to the house, how close was it to a substation or a transformer, that same wire code configuration, which was what Wertheimer-Leeper called it, was tested, but also, we went into the homes and made measurements of the magnetic fields. The study confirmed the relationship, but found statistically significant results only for childhood leukemia. In other words, whether the surrogate measure of exposure was used or whether one went into the home and made measurements of the magnetic field in the child's bedroom, in the living room, in the kitchen, there was a statistically significant elevation in risk for childhood leukemia. It was stronger however for the surrogate measure than the direct measurements.

So, from that point in time, there was

increased interest in this whole question. It lead to numerous studies in many different countries focused on two (2) levels of exposure, residential exposure, so exposure in the home, and also occupational exposure of adults. The studies of childhood leukemia and residential exposure, while this is a very controversial area, and I'm certainly not going to say that every study got exactly the same result, but what I rely on in issues like this where there are many different studies, people get somewhat different results, I rely primarily on meta-analyses.

A meta-analysis is when an epidemiologist takes multiple numbers of studies, evaluates the merit of each, and tries to pool the results. There have been three (3) major meta-analyses of the relationship between childhood leukemia and exposure to magnetic fields, from electricity and power lines. All of them have reported statistically significant elevations in childhood leukemia. There have been a number of reports of adult occupational exposure and adult leukemia. In general, those results are less strong than the case for childhood leukemia, but in the meta-analyses, they do show elevated risks that are

statistically significant.

To my knowledge... well, I should say that in the New York State power lines project, we did support one study of residential exposure of adults that did not show statistically significant elevations. I know of only one study that has, in an adult population, looked at both residential and occupational exposure. That's a study by Feychting et al., which is included in the documents that you have. In that study, there was not a statistically significant elevation in leukemia if you looked only at occupational exposure. There was not a statistically significant elevation if you looked only at residential exposure. But when you looked at both residential and occupational, there was a statistically significant elevation of about, I believe, three point seven (3.7) fold.

Q. [7] Just so that we may understand, when you say three point seven (3.7) fold, can you explain what this kind of number means?

A. That number is described either as an odds ratio or a risk ratio. And what it means is that you take the population that you are examining that you assume may have some elevated risk of disease and you're comparing the disease in that population to

another population that you assume has less exposure -- nobody has no exposure -- so, it's lesser exposure than your presumed exposed group. Now, if there is no difference, that ratio is going to be one. If the group you thought was going to be exposed is actually protected, that relation will be less than one. If it is at greater risk, it will be greater than one. And in epidemiology, because no result is ever without some variation, we define results as being statistically significant if there's less than a ninety five percent (95%) chance that those results could be random.

So, when we talk about three point seven (3.7) as an odds ratio, if I say it's statistically significant, then, there is a lower and upper bound that's always given around that number. If the lower bound is below one point zero (1.0), then that result is not statistically significant. If it's above, then it is stated to be statistically significant.

I should say that, you know, study of human health is not an absolute science and there always is the possibility of confounders, of factors that would either give you an artifactually low or

artifactually high odds ratio. So, this is what goes into these meta-analyses, how well did individuals control for this, control for that and... So, one always has to take these odds ratios with a certain critical view. Now, it's much easier to find no effect than it is to find effects. And so, finding an elevated odds ratio that's not statistically significant does not mean there is no risk, it means the investigator has not proved a risk. The same thing for an odds ratio that's less than one, it doesn't prove a benefit, but it does invite additional study.

10 h 01

Well to go on with my involvement in the study of electromagnetic fields, and again I should say during all of this period of time I was a very active researcher. I have over three hundred and fifty (350) publications in peer reviewed journals, I have a few around electromagnetic fields but they're review articles, they're not original research.

The major focus of my research however has been, and continues to be, human disease that is caused by exposure to environmental agents. I have been most active in recent years in study of

chemicals, particularly persistent chemicals, PCBs, chlorinated pesticides, dioxins, my research has focussed a lot on the Mohawk nation at Akwesasne, at the New York-Quebec-Ontario borders. I have also been involved in populations in northern Alaska, in Anniston, Alabama, which is the site of the Monsanto plants that manufactured PCBs. Recently I have become very interested in adverse health effects of air pollutants. Those are different subjects here but they are subjects where the same methods are applied. In those cases, my laboratory does a number of the measurements but we report risks and odd ratios just as I have described for these fields. Now because of my involvement in the New York State power lines project and because after the project ended I became the official spokesperson for New York State on health hazards, it's an area where, when one ever becomes involved in this, you never escape and so I have been invited, I was invited to edit books on the subject, there's a two volume book published I believe in nineteen ninety-four (1994), I'm not exactly certain, where I wrote with a colleague the introductory and I wrote by myself the conclusion on public health chapter. I was invited to write

review articles in other...

Q. [8] Sir, the book was on what subject?

A. Health effects... Biological effects of electric and magnetic fields. It included both extra low frequency, which is the term that's normally applied to power line electricity fields and radiofrequency fields. Although at that time, there was much more evidence around the power line fields so there are only a couple of chapters on radiofrequency fields. I served on a committee of the National Council on Radiation Protection and Measurements on the general subject of electromagnetic fields. Unfortunately that committee never released its final report because the chair of the committee became ill and died. I later was invited to be a co-editor of a web-based report called the BioInitiative Report which appeared four years ago. It was a report where we identified authors on specific subjects that wrote rather encyclopedic reviews.

Allow me to describe the BioInitiative Report because it has gotten a rather enormous amount of attention and it's also gotten a significant amount of criticism. The BioInitiative Report, the authors were invited by my co-editor

and me. It was a web-based report so in that regard it was not peered reviewed. We, in academic science, really depend on peer review as a gatekeeper for quality of publications. So there is some legitimacy to the criticism of the BioInitiative Report, so under those circumstances why would we do such a thing? Well the reason we did that is the perception that I have that other co-authors of the BioInitiative Report have, that national and international committees that review this question of health effects of electromagnetic fields do so with a very jaundiced eye and in a fashion...

Q. [9] Sorry, I didn't understand, do so in what?

A. A very jaundiced, prejudiced eye.

Q. [10] Oh, I'm sorry.

A. Many of these committees are dominated by engineers and physicists and the engineering and physics community has what they think is an absolute final conclusion that is impossible for there to be adverse health effects from electromagnetic fields that are at sufficiently low intensity so as not to cause tissue heating. One of the reasons that in my report there is such an enormous number of references, is to try to make the point that that

conclusion is totally false. This is like people saying the earth is flat because you can't see the edge. Now, I understand the issues of the levels of the energy. Again I come from this question as a public health person. Public health is a profession where my job is to do what I can to prevent disease. It's very nice to know the mechanism. Is it essential if you have strong evidence that human health is adversely impacted, to know the mechanism? I don't think it is. We do not know the mechanism of most kinds of cancer. We do have a pretty good idea of the mechanism of cancer caused by ionising radiation. Ionising radiation, some of which is also electromagnetic, but has higher energy than the fields we're talking about. It has sufficient energy to directly break chemical bonds, to damage DNA, to cause mutations. And most cancers are associated with direct damage of DNA. No, I don't mean that. They're associated with damage of DNA whether direct or indirect.

10 h 08

Now, there are many known human carcinogens that do not directly damage DNA. And the two that I would raise initially would be arsenic and dioxin. Both are rated by the World Health Organization, by

several different agencies of the U.S. government as known human carcinogens. And yet, there is inconvertible evidence that they do not directly damage DNA. They do damage DNA, but they do so indirectly, through mechanisms that we don't really understand. And we had exactly the same situation with both power line and radio frequency fields. They do not directly damage DNA, but they do a host of other things that lead to DNA damage and that may be, and I emphasize maybe, because we have lots of unknowns here. But they're possible, and indeed likely mechanisms that lead from exposure to cancer.

Now, subsequent to the web-based publication of the BioInitiative Report, I was a major author of the public health chapter. I'm very sensitive to this question of peer review, because it's something I hold very dear. That chapter was submitted, rewritten to some degree, submitted to a peer review journal and was published separately in the journal reviews on environmental health. Many of the chapters, not all of them, but many of the chapters of the BioInitiative Report were subsequently published in somewhat revised version in the Journal of Pathophysiology, again a peer-

reviewed journal. I should say that we are currently just beginning a revision of the BioInitiative Report, which will hopefully be done in another year's time, updating the evidence presented there over the last five years.

Beyond that, you know, I'm frequently asked to speak at universities on these issues, and especially now concern around smart meters, on wi-fi, on... you know, I'm sure this is a Wi-Fi device. We all live in a room that's bathed with electromagnetic radiation. There's no way we're going to avoid being exposed. If you can turn on your radio or your television, that means that there are radiofrequency electromagnetic waves in your environment. We're not going to go back to a pre-wireless age, that's not what I'm advocating. - I have my cell phone, I don't know the number because it's never turned on, but I use it to call out when I need to. -- But what I hope to show you today, is that there is enough evidence, and that evidence comes primarily, in the terms of radiofrequency fields, primarily from people that use cell phones for long periods of time, for many hours, and in relation to brain cancer. There's some evidence, it's less strong, but there's some

evidence for elevated rates of cancer in people that live near radio and television and cell phone towers. I will not tell you that this evidence is totally complete. I will tell you, however, it's strong enough so that as a public health professional it is my responsibility to say we should do what we can to reduce exposure in ways that are neither excessively expensive or excessively regulatory. It's just logical. Everyone as a child was taught that an ounce of prevention is worth a pound of cure.

There are ways in which we can use radiofrequency radiation, and use it safer than if we just proceed headlong, denying that there are any reasons for concern. And I'm not an engineer, I'm not going to speak in terms of exactly what we can do, but I think if the government does not acknowledge that there is reason for precaution, it will be like the situation we had with smoking and lung cancer. The evidence is strong, it's not complete, it's growing. And ten (10) years from now, it's going to be much stronger. In twenty (20) years, it's going to be much stronger. And by that time, we'll likely both have increased the risk of disease in significant segments of the population,

and it's going to be almost too late to establish the precaution that should be established right now.

So, I certainly am not going to say we know all the answers. We do not. But we know enough to be... to justify proceeding with caution, proceeding in ways where we set up efforts to reduce unnecessary exposure. At the same time, we don't stop progress for communication.

Q. [11] Dr. Carpenter, would you be kind enough to elaborate on your role at the university at Albany and the Environmental Health Sciences School of Public Health, and the Institute for Health and the Environment at that university?

A. Well, I told you about my period of time working for the New York State Department of Health. One of the other things I did from, really form the day I arrived in Albany in nineteen eighty (1980), I saw in this state research agency, a real lack of academic involvement.

10 h 14

Students are wonderful because they ask questions that are hard to answer, they have no great respect for anybody, and that's a good thing. So, I decided, when I was the director of that

laboratory, that we needed to develop an academic affiliation. The local programs weren't interested, and so, we created our own. And I was the founder of the School of Public Health at the University of Albany, which came into existence in nineteen ninety-five (1985). And in nineteen ninety-five (1985), while still remaining employed by the New York State Department of Health, I was relieved of my position as director of the laboratories and was assigned the position of being Dean of the School of Public Health. And that was a period of time where my personal understanding of how important it is to prevent disease grew. I had never, prior to coming to Albany, considered myself a Public Health person, I was a basic researcher. I held that position until 1998 as dean of the School of Public Health, while being employed by the New York State Department of Health, which in itself is very unusual. So, initially, we had almost no faculty except those faculty that were employed by the State Department of Health. We have slowly added university-paid faculty. I think to this day this is a unique school in that it is the majority of the faculty are actually employed by the New York State Department of Health. In nineteen ninety-

eight (1998), I stepped down as dean, being anxious... first of all, the School of Public Health was pretty well complete in terms of departments and programs. And I was very anxious to be removed from some of the administrative responsibilities and be able to spend more time in research. So, I moved my faculty line from the New York State Department of Health to the university, where I am now professor of Environmental Health Sciences. I teach classes, I teach major classes in introduction to Environmental Health, I also teach in the Neuroscience classes and undergraduate Environmental Health classes. But I had also learned from experience in interdisciplinary research programs, how valuable it is when you have a problem, to approach it from multiple perspectives.

10 h 18

And I had headed a large research program focused on health effects of PCBs that, by the way, was designed require that you have epidemiologists and toxicologists and ecologists and engineers all working on the same subject and our subject was the General Motors, Alco, Reynolds Metals, aluminium foundries, on the Saint-Lawrence River and the

adverse effects that had on the health of the Mohawk population at Akwesasne. Well, we lost our funding for that project in two thousand (2000) and so I had the lead in creating the Institute for Health and the Environment as a research institute of the University at Albany that reported to the Vice President for Research, not to the Dean in the School of Public Health who was my reporting person in my faculty role. But this Institute has members who come from the different departments of the University, not just the School of Public Health, it also has members that are scientific collaborators, it has international colleagues that are members, and it's been a very good thing. The Institute last summer was declared to be a collaborating centre of the World Health Organization and while that is not solely my, due to me, although I wrote the application and a lot of the international activities have been, once I was very personally involved in, it reflects the fact that the Institute is not just a local, or even statewide function, but has had major impact on international public health.

I have personally had, and have, researched projects in many different countries, collaborators

from many different countries. I currently have a grant in Pakistan, a grant in Uganda, major collaborators in Turkey, in Saudi Arabia, in China, in Japan and I have been an organiser for international conferences in a number of places, perhaps the most successful was, conferences in the broad area between Pakistan and Turkey where, through a series of conferences in Kazakhstan and in Turkey, we've resulted in creation of an organisation called the Euro-Asian Association for Children's Environmental Health. Again, that organisation deals with a host of issues, there is some concern in those countries of health effects of electromagnetic fields, but the issues there are more general than just that.

Q. [12] You mentioned that the Institute had received, had been nominated by the World Health Organization to play a certain role, could you elaborate on that?

A. Yes, the collaborating centre's network is a network of academic, mostly academic institutions, some government institutions, around the world, and there are collaborating centres in environmental health, I think we're the only one in North America. There are several in Europe but there are

collaborating centres in occupational health, some specifically children environmental health, I know you have some in Montreal, I believe in occupational health, but I don't know the details on that. But the idea of the collaborating centres is that these are people that are to work with WHO on a variety of projects. Now I've been very involved with WHO, I've been the chair of an advisory committee, let me back up, the National Institute of Environmental Health Science which has been my main funder over the years has supported the World Health Organization for some specific activities and I have chaired the advisory group that advises NIEHS and WHO on those programs activities for the last five years I guess. I have also been a reviewer on various WHO programs, I don't believe any of them have specifically dealt with EMF, but I work closely with WHO and the point of these collaborating centres is to have individuals that can be drawn on for various WHO activities. I was asked to be a member of a team reviewing environmental risks of childhood cancer in Europe, specifically in Europe. We have a report published there a couple of years ago. I've just received an invitation to serve on a committee for

the International Agency for Research on Cancer, IARC, for review of a new publication on cancer and PCBs. That will not begin until next year. So the... and what I am talking about, my personal involvement, other members of our Institute, other faculties of the University at Albany have also been involved in these meetings, in WHO activities, and serving as individuals that WHO can draw on when they need assistance in different areas.

Q. [13] Do you serve any function in Canada or in the Province of Quebec specifically?

A. Well yes. For the last three years, I've been one of the reviewers of the Quebec cancer program, I am sorry, I don't remember the exact name but this is really quite extraordinary to have a provincial program that supports grants up to a million dollars ($ 1 M) a year for five years and there's a review committee, I believe it's four or five members all drawn from outside Quebec. Applicants must be Quebec based, it must be an application that involves more than one university. It is expected that it will involve epidemiological studies of human health but also some other laboratory based studies. An excellent program and there have been wonderful grants that have come

through there.

Q. [14] You mentioned on several occasions that you evaluated the research of others, could you, is there anything you wish to add on that during the course of your functions, your various functions?

10 h 24

A. Well, I should say that I'm really quite experienced as an editor of scientific journals. I was the founding editor of the journal Cellular Molecular Neurobiology. I'm on the editorial boards of numerous journals. I've been recently appointed as the co-editor in chief of two journals, including the reviews in Environmental Health, and a new global Public Health journal.

One of the functions when you have these roles as editor -- and also, of course, I peer review journals, peer review manuscripts for many different journals -- but if you're an editor of a journal, you don't want to publish work that's not substantiated, that's not of high quality. And it's rather like reviewing grants, you don't want to see money wasted on proposals that have inferior designs that are unlikely to yield significant results. So, I've simply applied that experience when it comes to questions of electromagnetic

fields. Because of the fact I've been so involved in reviewing and writing summaries, I have a very comprehensive file cabinets, full of most of the major publications related to EMFs, some of the publications are good, some of them are outstanding, some of them are worthless. And that's true in every area. And what is important for an objective science-based person is to ignore the ones that are unconvincing and to look at the weight of evidence in a field, and particularly in relation to EMF, that's where I come from. What is the weight of evidence, does it constitute proof. And I should say right now, that in most cases, I would not say that it constitutes proof. Does it indicate strongly that there's something there for which there are a lot of things we don't yet understand. That's exactly where I see the EMF issue.

The weight of evidence says there's something there. Is it so weak that you should just ignore it and tell everybody: Forget about it. Absolutely not. There are lots of questions that we don't understand. And often, when we don't really understand the magnitude of the risk, that is going to ultimately lead to increased understanding that

the risk is even greater than the early studies suggested.

Q. [15] Before today, did you ever testify before either a Court of law or an Administrative Tribunal?

A. Yes. I've served as an expert witness primarily on cases related to chemicals, some on electromagnetic fields. I was invited to testify at the U.S. Congress for a congressional hearing on health effects of electromagnetic fields. This was perhaps five years ago. It was a committee headed by representative Kucinich of Ohio. I was invited to present at the President's Cancer Panel I believe two years ago, three years ago. The President's Cancer Panel is an appointed panel of three individuals that review different aspects of cancer and issue reports every two or three years. And the last report, which is an extraordinary report, is focused on cancer from environmental exposures. Now, the President's Cancer Panel Report does not take a strong position on the question of whether electromagnetic fields pose hazards. They acknowledge the issue, they acknowledge the controversy, they state that more research is needed, but my presentation to them was pretty much

what I've said this morning.

In my judgement, the evidence is very strongly suggestive, I think the hazard is greater than even that that you would conclude from the peer-reviewed meta-analyses that have been done. And I think it's appropriate that we practice the precautionary principle. The precautionary principle, which comes from the United Nations Convention held in Rio de Janeiro...

Me MARIE-JOSÉE HOGUE:

I'm going to make just a short interruption. I think we are going into the heart of the testimony now, we are far from the voir-dire. So, I would like, for the time being, just to stick to what is relevant to the context of the voir-dire, and then we'll come back later on, if need be.

Me DOMINIQUE NEUMAN:

Q. [16] The voir-dire means describing your curriculum vitae.

A. I understand.

Q. [17] Yes, okay.

A. No problem.

Q. [18] One last thing, is there a publication you're presently working on?

A. Well, I was invited to write the chapter on

electromagnetic fields for the textbook on Toxicology. I have the page proofs to that article, but it will appear some time very soon. This is a very distinguished toxicology textbook. It's in something like the sixth or seventh edition I believe. But this would be the first time that I was asked to author that chapter.

Me DOMINIQUE NEUMAN:

So, I have no further questions on the curriculum vitae and Dr. Carpenter is available to answer other questions on this subject.

10 h 30

CROSS-EXAMINED BY Me MARIE-JOSÉE HOGUE:

Q. [19] Good morning, Dr. Carpenter.

A. Good morning.

Q. [20] Welcome to Montreal.

A. Thank you.

Q. [21] You do mention that you are a public health physician, educated at Harvard Medical School. My understanding is that actually you received an MD from Harvard Medical School?

A. That's correct.

Q. [22] Have you received a Ph.D. from Harvard?

A. No.

Q. [23] No?

A. I have no degree other than a Bachelor of Arts and an MD

Q. [24] No other degree from any school?

A. No.

Q. [25] Any other university? So, the only degree you're having is the MD from Harvard?

A. That's correct.

Q. [26] So, on your web page that I took from the University of Albany's site, it's mentioned that actually you have a doctorate. It's not a doctorate in the sense of a Ph.D.? It's really an MD that you have?

A. That's correct, that's my degree.

Q. [27] Are you licensed to practice medicine or have you ever been licensed to practice medicine?

A. No. In the U.S., you have to take internships in order to get a medical license. You have to take three exams. I've taken the first two. I did not intern. So, I wouldn't be eligible to practice medicine. And of course, the difference between a public health physician and a practicing physician is that in public health, our concern is the population. We try to prevent disease in the population rather than treat individuals. So, there's no licensure for public health physicians.

Q. [28] Are you board certified in any medical field, or not at all?

A. No, you can't be board certified unless you're licensed.

Q. [29] Okay. And if you haven't done any internship, so it means that what you have done is written the first exam, and that's it? Nothing else but your MD?

A. The first two exams.

Q. [30] The first two exams have been written?

A. Yes.

Q. [31] Are you a member of any professional corporation?

A. You mean a professional society?

Q. [32] Yes, a professional corporation, a corporation that actually looks after a certain group of professionals.

A. I don't...

Q. [33] For example, the professional corporation for the doctors, or the professional...

A. The American Medical Association, no. No, I'm not a member of that. I am a member of a number of Academic Societies, I've served as an officer in some of those, but I'm not currently an officer of any.

Q. [34] Are you familiar with the American Board of Preventive Medicine in the U.S.?

A. Yes, I am. Yes.

Q. [35] Could you tell us what it is?

A. Well, the American Board of Preventive Medicine is a board of people that are licensed to practice medicine, who also are given specific training in public health. To be licensed by the American Board of Preventive Medicine, you must have two years... you must have, first of all, an internship and have taken all three segments of the licensing exam. You must have two years in public health practice and you must obtain a Masters of Public Health degree. So, I've supervised a number of the Masters of Public Health students that are in the process of getting their accreditation to the American Board of Preventive Medicine. But that's somewhat different from being a public health physician, because people that are licensed in preventive medicine usually operate out of hospitals, in clinics. But it's something that I very much support, because one of my concerns is that most practicing physicians aren't very concerned about preventing disease. They make their income by treating it, and people that are licensed in

preventive medicine have both the training and the goals of preventing disease.

Q. [36] So, I'm getting from your answer that actually you are not a member of the American Board of Preventive Medicine?

A. That's correct.

Q. [37] And you're using the expression "physician". Are you authorized to use the "physician" expression? Because I know that in the state of New York there are some provisions dealing with the use of the "physician" expression. Are you authorized to use it since you're not a licensed doctor?

A. My official position with the New York State Department of Health was as a Research Physician.

Q. [38] Research physician?

A. So, the answer is definitely yes. Now, the term "physician" in general means you have a medical education. There certainly have been some people that have abused that term, that have other degrees, but the term "Public Health Physician" in general implies that someone is not licensed to practice medicine, but they're trained in public health.

Q. [39] Do you have any license that have been issued to you by the New York State Board of Regions? Or

not at all, given what you're doing?

A. The State Board of Regions issues licence to academic institutions to offer degrees. They don't give license to individuals, to my knowledge. But the short answer is no, I don't.

Q. [40] No? Okay.

A. I don't even know what those would be other than approval to offer degrees by universities.

10 h 36

Q. [41] You have published, based on the review I made of your CV, hundreds actually of articles based on research that you conducted yourself.

A. That's correct.

Q. [42] And I would like to know if you have conducted yourself, or with a group, but you being part of the group, any research on the radiofrequencies and the effect of the radiofrequencies.

A. No, I have not.

Q. [43] When you are talking about the electromagnetic fields, are you talking about the sixty (60) hertz power?

A. Well, I'm really talking about the full electromagnetic spectrum which is everything from DC fields to the ionising fields from cosmic rays, gamma rays, x-rays. All of that is part of the

electromagnetic spectrum.

Q. [44] Okay so...

Me DOMINIQUE NEUMAN:

Q. [45] On the last question, my consoeur asked when you talk about, is she referring to the CV or the substance of the report for this case?

Me MARIE-JOSÉE HOGUE:

Q. [46] I am still on the voir-dire and it's based on what he, what he said. On many occasions, he referred to the... to the electromagnetic fields, so I just want to know what you are referring to. So, just for us to be all on the same page, I would like you just to describe actually to what you referred to when you use few terms in the context of the answers you gave to...

A. Right.

Q. [47] Me Neuman. So first of all, you made a difference between the... this word is difficult in English, ionised radiation?

A. Yes.

Q. [48] So I would like you to explain what are the ionised radiation because this is something that you have worked, you conducted some research...

A. That's correct.

Q. [49] ... in that respect. What are the ionised

radiation? Is it the X-ray, the gamma ray? And what else?

A. Well, there are two kinds of ionising radiation. There's particulate radiation which are alpha particles, beta particles, particulate radiation. Neutrons, protons. When you talk about electromagnetic fields, that does include some portion that is ionising. Those are the x-rays, the gamma rays and the cosmic rays; and I'm not going to be talking about those very much today although I described that in my background. There are two, there are three general terms I should be using and I am sorry if I have confused you. I'll be talking about non-ionising radiation.

Q. [50] Those are the RFs?

A. Non-ionising radiation...

Q. [51] Amongst others, the RFs are non-ionised radiation.

A. That's correct. But the power line frequency fields are also non-ionising. So the term I'll try to use for the communication frequencies is radiofrequency, EMF, whereas the power line frequencies most people will call those ELF for extra low frequency. So I think from here on, we can talk about radiofrequency, or RF, which is part

of the non-ionising EMF spectrum, but it's those frequencies that are much greater than electricity but much less than ultraviolet.

Q. [52] Okay. Do you agree that actually when we talk about sixty (60) hertz fields, magnetic or electric, we do not speak about radiation?

A. No, I don't agree with that.

Q. [53] You don't agree with that?

A. No. That's part of the electromagnetic fields, it is radiation but it is non-ionising radiation in the traditional terms.

Q. [54] Okay. And that's the...

A. That's the ELF.

Q. [55] That's the ELF. Okay. And the ERF, just explain what you just mentioned, the difference you made between both.

A. Well the electromagnetic spectrum goes over this great frequency. It's various sine waves, how fast they travel, how all of them are at the speed of light. Light is non-ionising radiation. And we know that the different frequencies because when you see the purples and the reds in a rainbow. The same thing at lower frequencies. The radiofrequency fields, those used for communication, for smart meters, for cell phones, for this, they are at

lower frequencies than visible light, but they are much higher frequencies than in the extra low frequencies, so the term I will try to remember to use is RF, radiofrequency.

Q. [56] And if we stick to the RF, radiofrequencies, I just want to know if you have, yourself, conducted any research?

A. No, I have not.

Q. [57] Okay. Have you published any peer-reviewed articles on this topic?

A. Yes.

Q. [58] Which one?

A. But they are review articles, they're not research, individual research, except scholarly research of evaluating the studies of others.

Q. [59] And you're making a distinction between a review article and an article based on research? I would like you just, again, to make the difference because I think it's important to understand where you are coming from in terms of your background.

A. Well, when I talk about a research article, my definition of it is that's a laboratory study or a field study that you did yourself. Now when I talk about a review article, there also is research involved in that because you're reading everybody

else's papers. You're trying to critically evaluate them but, and the review articles that I have published with the exception of the BioInitiative Report, have all been subjected to the same peer-review evaluation by others that my original laboratory studies have been subjected to.

10 h 43

So, many of my publications -- and my priority is my own research -- but there is very important research in a critical review article as well, it's just of different sort.

Q. [60] So, I would like you to identify those articles that you have published dealing with the RF. You can maybe use your CV because there's...

A. I don't think I need to. The BioInitiative Report, which was not peer reviewed, the reviews on Environmental Health chapter on... I've forgotten the title...

Q. [61] Maybe you can use your CV, it's going to be useful for us as well as for the President of this board.

A. Can someone remind me where my CV is in this package?

Q. [62] I think it's in your computer.

LE PRÉSIDENT :

0059, pièce 0059. 60.

Me DOMINIQUE NEUMAN:

Q. [63] Dr. Carpenter, if you don't have it, I can give you my computer.

A. I have everything else, I don't seem to find my CV.

LE PRÉSIDENT :

Ce serait peut-être plus facile avec une version papier. De la couleur, mettez de la couleur à côté. Vous nous le redonnerez après.

A. It will be a lot faster than scrolling down there.

Me DOMINIQUE NEUMAN :

Est-ce que vous voulez ma version électronique pour...

LE PRÉSIDENT :

Non.

A. All right, reference 310 in my CV, Carpenter and Sage: Setting prudent public health policy for electromagnetic field exposures in the reviews of Environmental Health. Reference 316, Sage and Carpenter: Public health implications of wireless technologies published in Pathophysiology in two thousand nine (2009). Reference 323: Electromagnetic fields and cancer. The cost of doing nothing , reviews in Environmental Health,

volume 25 in two thousand and ten (2010). Reference 327: Human health effects of EMFS. The cost of doing nothing in the IOP, which is the Institute of Physics, conference series.

THE PRESIDENT:

Q. [64] Dr. Carpenter, could you speak closer to the microphone...

A. I'm sorry.

Q. [65] ... because some people don't understand what you're saying at the back of the room.

A. So, reference 327: Human health effects of EMFS. The cost of doing nothing published in the Institute of Physics, conference series, in... I guess the meeting was in two thousand and four (2004), but it was published in two thousand and ten (2010). I believe that is all.

Me MARIE-JOSÉE HOGUE :

Q. [66] Then, we'll take them one by one. 310, Carpenter and Sage: Setting prudent public health policy for electromagnetic field exposures . Is it a peer-reviewed publication?

A. Yes, it is.

Q. [67] Is it an editorial that you have published or an opinion article or is it an article based on the review of the literature on the subject?

A. It is an article based on the review of the subject. And this one is the article I mentioned which is a revision of chapter 17 of the BioInitiative Report.

Q. [68] So, it's a revision of what has been done for the BioInitiative Report and you have made some adjustments for this article?

A. Not many adjustments, but we had to put it in the style of the journal. It covers almost all of the same things that chapter 17 of the BioInitiative Report did.

Q. [69] If we go at 316 now, is it a peer-reviewed journal?

A. Yes, it is.

Q. [70] And is it an editorial, an opinion text, or is it a review of the literature?

A. It's a review of the literature. And there's considerable overlap between those two publications.

Q. [71] Between 310 and 316?

A. That's correct.

Q. [72] So, would it be true to... exact to say that actually 310 as well as 316 is the chapter of the BioInitiative Report that you have actually modified a little bit and put in a different form?

A. Yes. 316 had much shorter page limits, but it still was peer-reviewed so it had to be condensed from what 310 was.

10 h 50

Q. [73] And 323. "The electromagnetic fields and cancer, the cost of doing nothing", is it a peer-reviewed journal?

A. Yes. This is the same journal...

Q. [74] It's the same one as 310?

A. ... as 310. But this was the article that I prepared for the President's Cancer Panel. It reflected my presentation at the President's Cancer Panel as it happened, and it was through no action of mine. The people that were collecting those manuscripts decided to publish them in the same journal.

Q. [75] Okay. And is it a review of the literature or is it more in the form of the expression of an opinion?

A. This one probably is more in the form of expression of an opinion, because it had quite severe page limits, so while I reference scientific articles, it was not long enough to allow me to do a systematic review of the literature.

Q. [76] Okay. So, you will not qualify this article as

being a complete and accurate review of the literature on the subject?

A. That's correct.

Q. [77] Okay. If we go at 327, "Carpenter DO, a human health effect of EMFs", is it published in a peer-reviewed journal? It's a conference actually, but it has been published, I'm not too sure where. So, could you just tell us?

A. We're on 327, is that right?

Q. [78] 327.

A. Yes. This is interesting, because in this issue of EMFs, I often fight with the physicist. And this is a meeting held in London at the Institute of Physics, and it was a meeting on EMFs. And this is a peer-reviewed publication, although it's an online journal. It took them forever to get the publication, because the meeting was in two thousand and four (2004).

Q. [79] And it was published in two thousand ten (2010), you said?

A. That's right.

Q. [80] Okay. And is it a review of the literature or is it more in the form of an editorial, or the expression of an opinion?

A. It's more in the form of an editorial and opinion.

Again, we were very limited on pages, so it was not a comprehensive review of the literature.

Q. [81] Okay. So, you do agree with me that we cannot find in this article the complete and accurate review of the literature on the subject?

A. That's correct.

Q. [82] Okay. And when we are talking about the EMF, I want to make sure again that we are talking about the same thing. What are you referring to?

A. I'm referring to the non-ionizing portion of the electromagnetic spectrum. So, that includes power line frequencies, ELF and radio frequency, but in these articles, I'm not discussing the ionizing portion, the very high frequency.

Q. [83] Okay. And what about the 323, when you're using the expression "electromagnetic fields and cancer"? Does it include the RF?

A. The ionizing?

Q. [84] Yes.

A. No, it does not.

Q. [85] It does not.

A. Now, if I were to use the term properly, it should, but I was using it there to refer to the non ionizing portion of the electromagnetic spectrum.

Q. [86] Is there any other article that you would have

published on the RF, or dealing mainly or partially with RF?

A. Well, the only other article would be this chapter for the Toxicology Textbook, which hasn't appeared yet. And that of course is not peer-reviewed in exactly the same fashion.

Q. [87] And it has not been published yet?

A. No.

Q. [88] You're still working on it?

A. No, I have page proofs on it. It's in press, but it hasn't appeared yet.

Q. [89] It has not been published? Okay. And I'm I right that even for the BioInitiative Report, you have not conducted any research?

A. That's correct.

Q. [90] And you're...

A. In the sense that I haven't conducted any personal involvement in measurements to studies of humans. It is research in the sense that it's a careful evaluation of the full literature.

Q. [91] Okay. Have you at any point in time received any grants for making any research on radiofrequencies?

A. No. Nor have I ever applied for any.

Q. [92] The BioInitiative Report have been published

in two thousand seven (2007), Mr. Carpenter. You were the co-editor of this report with Mrs. Cindy Sage?

A. That's correct.

Q. [93] Could you tell us if the group that participated in this report have been appointed by any scientific organization, or is it something that have been done on your own?

A. The authors were selected by Ms. Sage and me, as people that were leaders. All of them have done their own research and they have made significant contributions in the different subjects that were components of the chapter. But that was our role as editors, just to select the authors.

Q. [94] Okay. But then, the group have not been appointed by any scientific organization?

A. No.

Q. [95] Okay. Am I right in saying that Mrs. Sage is not a scientist?

A. No, I don't think you're right there. She's a masters level scientist. She's very knowledgeable in this area. She has not herself done a lot of, you know, direct field research, but she's a wonderful collaborator to work with and she took on the major administrative parts of putting the

report together.

Q. [96] Do you know actually what diploma she's having?

A. I'm sorry?

Q. [97] Do you know what diploma she's having?

A. She has a Master's degree, I don't know in what field.

Q. [98] You don't know in what field?

A. No.

Q. [99] And do you know what is her first degree?

A. No.

10 h 58

Q. [100] No? Do you know about, without knowing her degrees, do you know about her academic background? Or you don't know?

A. I don't know details about her academic background. I evaluate people on the basis of their abilities and, you know, she didn't graduate from school yesterday so I don't...

Q. [101] Okay.

A. ... really know the details.

Q. [102] And do you agree with me that she's having actually a business that is called CGMF Design that is providing consulting services amongst other things to home owners?

A. Yes.

Q. [103] And this is actually how she is making her living?

A. Yes, that's correct. Well, she makes her living from a variety of activities, but most of them are associated with the general issue of electromagnetic fields with a particular focus on radiofrequency fields.

Q. [104] Okay. And mainly through her business?

A. Mainly?

Q. [105] It's mainly through her business? The business that she has created?

A. Yes. Yes.

Q. [106] Okay.

A. But it's a business that applies for grants like those of us in the academic world do.

Q. [107] Okay. You have been involved in various study groups interested in various pollutants such as PCBs or you mentioned some of them, a certain number of chemicals. Have you been appointed by a scientific organisation on any study group on RF?

A. I mentioned earlier that I was appointed to this committee of the National Council on Radiation Protection and Measurements that unfortunately never completed its report.

Q. [108] Okay.

A. That was more focussed on ELF than RF but it was also dealing with RF.

Q. [109] Okay, but were you personally dealing with RF in the context of the role you were having with this group? I'm suggesting you were not there for the RF but for other things.

A. I wasn't there for the RF.

Q. [110] You were not there for the RF. And have you ever been a member of any study group that had been appointed by a public authority?

A. Well I certainly had that role in the New York State power lines project but...

Q. [111] But...

A. ... that wasn't RF of course.

Q. [112] Okay, but dealing with RF.

A. No.

Q. [113] I am sorry, I should have mentioned dealing with RF.

A. No.

Q. [114] Not at all? You have mentioned, in the context of the answers you gave to maître Neuman, I'm just trying to find my notes, that you are quite proud since the institute that you have been involved with has been, is in a certain way

connected to the World Health Organization and you have, in various ways, collaborated with the Health Organization. Have you, in the context of this collaboration with the World Health Organization, made any type of work with respect to the RF, or appointed to do any type of work with respect to the RF?

A. No, I haven't. And in fact I have rather fought with the World Health Organization RF people. I think that they have a pretty sordid history of minimizing risk, their previous director, when he retired from the WHO, immediately was hired by an Italian utility. I think there are some major issues of conflict of interest with regard to that particular program of the World Health Organization. So, I have interacted with them, yes. Not always in a positive fashion, but I've never been appointed to any of their committees.

Q. [115] You also mentioned actually that you have played a certain role with IARC, the International Agency for Research on Cancer. Was your role connected in any ways to the RF?

A. No, it was not.

Q. [116] You mentioned that the BioInitiative Report, I'm going back to the report, have got a good deal

of attention as well as criticism. Are you aware of any scientific groups that have supported the findings or the conclusions that we may find in the BioInitiative Report?

A. Well yes, there have been a number of groups that have supported those conclusions.

Q. [117] Okay, I am talking about scientific groups?

A. Yes. The... let me just pull out one thing, the American Academy of Environmental Medicine issued a very strong report that supports the conclusions of the BioInitiative Report.

Q. [118] The Environmental Academy?

A. American Academy of Environmental Medicine. The...

Q. [119] When was it?

Me DOMINIQUE NEUMAN:

Just a remark, Dr. Carpenter is answering the question but the question, the subject of the question is no longer the CV, it's referring to the substance of the report of Dr. Carpenter. But I don't have any objection...

LE PRÉSIDENT :

Non?

Me DOMINIQUE NEUMAN:

... that Dr. Carpenter answers that question but...

LE PRÉSIDENT :

Si...

Me DOMINIQUE NEUMAN :

... if my consoeur's...

LE PRÉSIDENT :

Dans son CV il réfère à un rapport...

Me DOMINIQUE NEUMAN :

O.K.

LE PRÉSIDENT :

... le BioInitiative Report, la question est : Est-ce que ce rapport-là, est-ce qu'il y a des groupes scientifiques qui se sont prononcés.

Me DOMINIQUE NEUMAN :

O.K.

LE PRÉSIDENT :

Monsieur Carpenter a dit que son rapport avait été sujet à des critiques positives et négatives là, donc on lui demande...

Me DOMINIQUE NEUMAN :

O.K.

LE PRÉSIDENT :

... est-ce qu'il y a des groupes scientifiques qui ont commenté ce rapport, l'ont approuvé, je ne sais pas. Ça m'apparaît tout à fait dans le... correct dans le contexte là, de où on fait une

investigation de sa qualité d'expert.

11 h 04

Me DOMINIQUE NEUMAN :

O.K. As I mentioned, I don't have any objection on answering that, it's just, if we start dealing with the substance of that report, the substance is...

LE PRÉSIDENT :

Non, non, on va finir avec ce qu'on appelle le ouï-dire, puis j'imagine que vous allez avoir des arguments à nous soumettre, à me soumettre, et puis j'entendrai ça, puis je déciderai. Et après ça, on continuera sur la substance, d'accord?

Me MARIE-JOSÉE HOGUE:

Q. [120] So, is there any other scientific group that have supported the conclusion of... found in this report?

A. Well, let me amend my answer. This report was issued on January twenty-ninth (29th), two thousand twelve (2012). In fact, the BioInitiative Report is not mentioned in the report. But the conclusions and the recommendations of that committee are totally consistent with the recommendations of the BioInitiative Report.

The other organization that certainly has supported the BioInitiative Report is the European

Environmental Agency, EEA. There have been... I must say I have not attempted to document groups that have supported the group... the report. But I think it's fair to say that there's been more criticism than official groups that have supported it. I wouldn't deny that.

Q. [121] But apart from this last one that you just mentioned, the European Environmental Group, is there any other group?

Me DOMINIQUE NEUMAN:

Agency. Environmental Agency.

Me MARIE-JOSÉE HOGUE:

Q. [122] Agency, sorry. Agency. Is there any other group, scientific group that have supported the conclusion of the report?

A. I don't think I can answer that. Honestly, I know that there are some European governments that have supported the report. I don't think it's the larger European country governments, but I don't really know the details of that.

Q. [123] Just maybe, it may help you, there are certain norms, and I don't want to go into the merit of the norms themselves, I just want to try to see if it can help you knowing whether it has been retained by any governments. There's certain

norms that are proposed, new norms that are proposed in this report. Do you know if these norms have been accepted and implemented by any countries?

A. To my knowledge...

Q. [124] Standards, if you prefer.

A. Standards, yes. To my knowledge, they have not. And if you look carefully at our readings in these reports, we were not proposing them as standards. We were identifying levels of exposures to radiofrequency fields for which there's some evidence that exposures greater than those levels is associated with human health hazards. We make two statements. One, it would be unrealistic to impose these as standards. It would affect too much. So, we were not proposing them as standards. On the other side, we also make a very clear statement that we have no real assurance that even those fairly draconian levels are safe. So, they were not proposed as standards. I know of no country or report since our time that has recommended that they be as... proposed as standards. While they have been many groups, not so much government agencies, but still many groups that have echoed our call for precaution because of

the strength of the evidence, but not focused on those particular levels.

Q. [125] You have also mentioned during the answers you gave to maître Neuman that in nineteen ninety-four (1994), you have wrote the introductory as well as the conclusions of two published books, that's what I got from your testimony, dealing with health of electric and magnetic fields, including radiofrequency field?

A. Correct.

Q. [126] Have you been involved in any way in this part of the book dealing with the RF?

A. No. I was involved only to the point of recruiting the authors of the two chapters, one on more the physics of RF and one on the radiofrequency, the human health effects. But as an editor, I might correct the grammar and be sure the references are all there, but I did not, in any way, influence the substance of the chapters.

Q. [127] You also mentioned that you... you have been requested to testify on a few occasions. Do you recall on how many occasions you have been requested to testify, be it in front of a court of law, or in front of a board, or any other type of deciding body?

A. Well, I've testified fairly often in courts of law, on legal cases, but most of those have not been the MF. Perhaps five have been.

Q. [128] Five maybe have been with RF, dealing with RF, radiofrequencies?

A. No, not five with RF.

Q. [129] How many with RF?

A. Probably only one.

Q. [130] Only one?

A. Other than today.

Q. [131] Okay. And where was it?

A. Well, it was a case on whether or not Portland, Oregon, would put Wi-Fi in all schools.

11 h 10

Q. [132] And it was in front of what type of body?

A. I was deposed in that case, but it hasn't come to trial yet, it's scheduled for trial I believe in October.

Q. [133] Okay. So, actually, you drafted a report, you were questioned by the attorneys out of court, but you have not testified in court yet?

A. That's correct.

Q. [134] So, in that context, the Court has not yet decided whether you are qualified or not on RF?

A. That's correct.

Q. [135] And in all the other cases where you testified, actually, it was in cases dealing primarily with chemicals and the effect of chemicals in various situations, in various contexts?

A. Yes. There have been certainly four or five, or maybe even more cases on ELF, but the majority of my testimonies have been related to chemicals.

Q. [136] Do you recall having testified in the case called the Allgood case?

A. Yes.

Q. [137] Could you tell the Court what it was all about?

A. I don't recall the details. It was a PCB case.

Q. [138] It's a PCB case?

A. Yes.

Q. [139] And do you recall having testified in the context of the Great River Energy case?

A. That sounds like a power line routing case, but I don't recall the details.

Q. [140] You don't recall the details of that? Okay.

A. Is that the case in Minnesota?

Q. [141] Great River, just give me a minute, I'm going to tell you. It's Minnesota.

A. Yes. Yes. That was an issue of routing a power

line, whether it would go right through a highly residential area, whether it could be routed into a more rural area that would impact fewer people.

Q. [142] And were you talking about RF in this case or...

A. No. No.

Q. [143] No.

A. That's all ELF.

Q. [144] And do you know if your testimony has been retained by the Court?

A. I believe that it was, yes.

Q. [145] That it was retained by the Court, your testimony, yes? And your conclusions, were your conclusions retained by the Court?

A. I've actually had no feedback from that case after my testimony. To the best of my knowledge, my testimony was retained by the Court.

Q. [146] And do you recall having testified in the Wisconsin Public Services, in front of the Wisconsin Public Services Commission?

A. I believe I did, that was ages ago. And that was on stray voltage and effects on cows.

Q. [147] So, nothing to do with RF?

A. Nothing to do with RF.

Q. [148] I have no further questions. Thank you.

LE PRÉSIDENT :

Merci, Maître Hogue. Si vous avez d'autres questions pour votre témoin, ça va aller après la pause. Et puis j'entendrais également après la pause, les arguments sur la question de la demande de statut d'expert du Dr Carpenter.

Alors, on va reprendre à 11 h 30.

SUSPENSION

11 h 30

LE PRÉSIDENT :

Alors Maître Neuman avez-vous des questions pour...

Me MARIE-JOSÉE HOGUE :

Moi j'ai une question supplémentaire avant...

LE PRÉSIDENT :

Je vous en prie, oui c'est correct.

Me MARIE-JOSÉE HOGUE :

Q. [149] Je lève la main comme à l'école. Dr. Carpenter, I would like to know for preparing the report that you have filed in front of the actual Régie, have you reviewed and mentioned in your report the bulk of the literature dealing with RF or have you made your own selection?

A. I have not looked at a book specifically on RF. I

have a very extensive reprint file on RF as well as the LF and when I was asked to submit to Mr. Neuman articles, my inclination was to give only a few. He asked that we identify a lot of the literature so what's in those reports is not everything that's ever been published but it's primarily things that I had copies of in my reprint file or was aware of.

Q. [150] Okay. Do you agree with me that actually it's not a comprehensive review of the literature dealing with the subject, but mainly a review of the articles and other types of literature that actually without necessarily supporting your own conclusions are not against your own conclusions, and those that are against your own conclusions are not mentioned in the report?

A. No, I don't agree with that. I think...

Q. [151] You don't agree with that?

A. I don't agree with that.

Q. [152] Okay. So are you suggesting that you did a comprehensive review of the literature dealing with the RF issue and mainly with the impact of the RF on the health of human beings?

A. I did not do a comprehensive review of the literature specifically for this case. I think I am as knowledgeable as anybody is on the literature

both positive and negative because of the fact that I have been involved in writing the BioInitiative Report, editing the chapters written by other people and that BioInitiative Report is encyclopedic, it does not ignore negative articles. The literature itself is enormous and so I wouldn't say that I did a comprehensive review specifically for this case, but certainly the enormous list of references to my report include many that do not support my particular position and I think that it is representative of the field.

Me DOMINIQUE NEUMAN :

Excusez. Excusez-moi. Là encore, on est en train de rentrer dans la substance parce que je n'ai pas encore posé mes questions au Dr Carpenter sur la substance pour qu'il décrive les différentes études, les pours et les contres et tout ça, donc moi je n'ai pas encore posé mes questions.

LE PRÉSIDENT :

Non, mais...

Me DOMINIQUE NEUMAN :

Et ma consoeur l'interroge sur le présent rapport donc.

LE PRÉSIDENT :

Vous savez on a publié, la Régie, récemment les

attentes de la Régie sur le rôle des témoins experts et dans ses attentes-là, on n'a pas rien inventé là, c'est ce qui est appliqué par la jurisprudence là, c'est qu'un expert doit venir objectivement informer un tribunal de l'état de, par exemple, ici ce que j'avais demandé quand j'ai autorisé le témoignage du Dr Carpenter, en dehors des délais d'ailleurs, j'ai demandé de faire le statut de la recherche scientifique sur la question de savoir si les émissions de la radiofréquence des compteurs nouvelle génération en question, dont on parle ici, peuvent, pas n'importe quoi là, les compteurs dont on parle, peuvent constituer un risque de dommages graves ou irréversibles pour la santé. Alors ça, on s'attend à avoir une opinion objective, d'où la question : Est-ce que vous avez fait, est-ce que votre rapport...

Me DOMINIQUE NEUMAN :

O.K. D'accord.

LE PRÉSIDENT :

... s'est, répertorie juste une partie des articles, avez-vous fait le tour? Il y a des opinions pour, des opinions contre, mais c'est dans, on s'attend à ce qu'un expert ne vienne pas défendre une thèse là, vienne expliquer

objectivement, est-ce que oui ou non, il y a des conclusions au niveau de la recherche, concluantes là, à... c'est ça.

Me DOMINIQUE NEUMAN :

O.K.

LE PRÉSIDENT :

Alors c'est directement en ligne avec les attentes de la Régie sur l'objectivité des témoins experts.

Me DOMINIQUE NEUMAN:

O.K. Je n'ai pas de problème avec ça, mais tout simplement que je vais revenir là-dessus aussi sur le fond du rapport quand il sera examiné plus tard.

O.K. Merci.

11 h 36

LE PRÉSIDENT :

Avez-vous des questions?

Me MARIE-JOSÉE HOGUE :

Je n'ai pas d'autres questions, moi.

LE PRÉSIDENT :

Maître Neuman, avez-vous d'autres questions pour votre expert sur sa qualité d'expert?

RE-EXAMINED BY Me DOMINIQUE NEUMAN:

Q. [153] Yes. Good morning again, Dr. Carpenter. My consoeur asked you a question about the time that you did not actually take an internship in

medicine, of the fact that you did or not pass the exams for an internship to practice medicine. When did that happen?

A. Well, I took one year out of medical school in nineteen sixty-one (1961), sixty-two (1962), went to Sweden and did research. I came back and graduated in nineteen sixty-four (1964). I was very ambivalent. I had a wonderful year doing research in Sweden. I knew I wanted to study the nervous system. I applied for one internship only, and that was at the Boston City Hospital, but only if they would allow me to avoid the general rotating things and focus on nervous system studies. They agreed to consider six months of rotating, two months of neurology, two months of neurosurgery, two months of psychiatry. But I ended up not being matched to that, and so happily went back into the laboratory, and I've... my thought was if I ever wanted to do clinical medicine, I could always go back and do the internship. I passed the first two exams, it was... You have to have an internship before you can even take the third. And I've never regretted the fact that I've moved into public health rather than clinical practice.

Q. [154] Yes, my question was simply to situate that

in time. So, that was in the sixties (60's). Also, there were questions asked to you by my consoeur, about whether or not you applied for research grants. But in the function that you had, working for the New York State, you did receive public funding for what you were doing?

A. Yes. That project was supported by the New York State utilities. And I administered the funding. There was no part of it that I received myself. And I should say that in every legal case that I've been involved in, whether it was chemicals, or with radiofrequency fields, or ELF, I accept only personally travel reimbursement, and all other funds go into my research account, so I don't make money by litigation.

Q. [155] So, there were certain questions about ionized radiation versus non-ionized radiation. Just to make it clear, all the radiations that we are talking about from smart meters are non-ionized, is that correct?

A. That is correct.

Q. [156] And the cell phones?

A. That's correct.

Q. [157] There was a question about the subject of various research that you quoted. Is it correct to

say that most research on RF deal with emissions... well, non-ionized radiations emissions, but from other devices than smart meters, because smart meters are newer?

A. Well, most studies, in the first place, there is never been a human health study on smart meter emissions. Smart meters have been around too short a time. The latency between exposure to radiofrequency radiation and most diseases is very long. In the case of cancer, probably twenty (20) to thirty (30) years. The issue around smart meters is that they use radiofrequency radiation and they have the potential to add to the aggregate exposure. And so, my hypothesis that I'm sure I will be asked to expend on further, is that studies on cell phone use and cancer are directly relevant to the question of smart meters, even though there is no human health study to date, that I'm aware of, that has specifically looked at diseases coming from smart meter RF.

Q. [158] And that's something that you will cover when you'll describe your report itself?

A. I suspect that's correct.

Q. [159] Okay. No further questions.

11 h 42

LE PRÉSIDENT :

Alors, merci Maître Neuman. Là on en est à la portion argumentation. Là, je voudrais vous entendre sur exactement ce que vous demandez. Et je le répète là. Alors, on demande que le docteur Carpenter soit reconnu comme témoin expert, médecin en santé publique, incluant les risques de santé associés à l'exposition aux émissions de radiofréquence dans le présent dossier. C'est exactement ça. Alors, je vous écoute.

ARGUMENTATION PAR Me DOMINIQUE NEUMAN :

Sur la qualification du docteur Carpenter comme médecin en santé publique, le docteur Carpenter a très fortement insisté là-dessus dans son témoignage aujourd'hui et ça transparaît dans son c.v. écrit, qu'il n'est pas... qu'il n'est pas un médecin traitant, mais un médecin de santé publique et que ses fonctions ont, en grande partie, été pour des organismes gouvernementaux ou des organismes mandatés par des utilités publiques, donc, comme il l'a mentionné, des laboratoires de recherche, des institutions d'enseignement, des comités sur lesquels il a siégé qui sont appelés à prendre des décisions de protection de la santé publique, des décisions donc qui s'adressent à

l'ensemble de la population, et donc des décisions qui sont basées sur l'évaluation du risque global pour la population. Et c'est cela qui constitue l'intérieur de la Régie, la description de la qualification que nous demandons. La question qui a été posée par la Régie dans sa décision procédurale consiste à décrire l'état de la recherche. Donc, pour décrire l'état de la recherche, le docteur Carpenter est très bien placé.

Il a dirigé des institutions, il a dirigé des chercheurs, il a dirigé des étudiants, il a eu des fonctions... des fonctions d'approbation de « grants », de financement à de la recherche et des fonctions à titre d'éditeur de différentes revues et de certains livres qu'il a lui-même publiés et dont il choisissait les collaborateurs. Donc, il a cette vision globale d'ensemble que nous recherchons.

LE PRÉSIDENT :

Je vais peut-être vous poser quelques questions.

Me DOMINIQUE NEUMAN :

Oui.

LE PRÉSIDENT :

Ça va vous simplifier la vie là. Il n'y a pas de doute que le docteur Carpenter a une expérience,

une longue expérience en santé publique. Alors, c'est sûr qu'il est capable de lire tous ces rapports-là avec une connaissance qui est différente de la mienne là. Bon. Ça, ça va. Mais, comment pouvez-vous demander qu'il soit reconnu comme un expert sur les risques de la santé reliés à l'exposition des émissions de radiofréquence alors qu'il n'est pas un clinicien et qu'il dit bien franchement qu'il n'a jamais fait de recherche dans ce domaine?

Me DOMINIQUE NEUMAN :

Bien, je pense...

LE PRÉSIDENT :

Alors, je comprends qu'il s'intéresse depuis des années à ce sujet-là là, la santé publique, et qu'il se tient au courant de tous ces articles-là, mais il n'est ni un clinicien ni un médecin ni... Il n'a pas fait de recherche sur cette question précise, puis là vous demandez qu'on lui reconnaisse un statut d'expert en la matière. C'est ça qui m'intéresse.

Me DOMINIQUE NEUMAN :

Je vous soumets respectueusement que son statut est supérieur même à celui qu'aurait un clinicien qui serait centré sur l'étude spécifique qu'il a faite

sur un chercheur. Lui, il supervise la recherche. Et son mandat, son mandat consiste à vous informer sur l'état de la recherche scientifique, donc non pas sur une recherche spécifique, quelqu'un qui aurait peut-être passé cinq ans de sa vie à faire une recherche spécifique, à travailler juste sur celle-là. Sa fonction est de superviser, il supervise... dans sa fonction gouvernementale, sa fonction pour différentes institutions et comités, sa fonction... ses fonctions universitaires, ses fonctions d'éditeur, il supervise ces recherches. Donc, s'il y a quelqu'un qui est bien placé pour vous informer sur l'état de la recherche scientifique sur ce risque, c'est bien davantage quelqu'un qui supervise ce domaine plutôt que quelqu'un qui aurait lui-même passé, bon, cinq ans sur une recherche numéro 1, cinq ans sur une recherche numéro 2. Et au bout de la ligne, cette personne-là serait centrée sur les cas particuliers qui auraient fait l'objet de sa recherche spécifique. Donc, c'est dans ce sens-là que je vous soumets même que c'est la meilleure personne pour vous fournir ce type de renseignements.

Et également, dans la question qui a été posée par la Régie, on référait aux termes, aux

mots qui sont employés dans la définition du principe de précaution. Donc, on utilisait... je ne les ai pas par coeur, mais en tout cas, sur un risque... un risque pour la santé, en tout cas. Donc, on utilisait les termes qui sont employés dans la définition du principe de précaution.

Et à ce sujet, monsieur Carpenter justement, de par ses fonctions notamment gouvernementales, son rôle était de déterminer s'il y a effectivement, compte tenu de l'état de la recherche, un risque, un risque d'un niveau suffisant pour justifier l'application de mesures de précaution.

Je préfère, enfin, je préfère utiliser ce terme-là de « mesures de précaution » plutôt que le principe abstrait de précaution, c'est des mesures. Il a donné le... monsieur Carpenter a décrit tout à l'heure qu'il y a des mesures qui peuvent être prises qui peuvent être peu coûteuses et qui permettent de réduire le risque d'exposition si on constate qu'il y a une masse, une masse de preuve, une masse de recherche qui indique qu'un tel risque peut exister et...

LE PRÉSIDENT :

Je pense qu'on confond les choses là. J'ai dit que

la Régie était intéressée, puisque c'est une question qui était débattue, de savoir quel est l'état de la recherche sur la question de savoir si, oui ou non, l'exposition à des radiofréquences de ces appareils-là peut causer des problèmes de santé, ça... Bon.

11 h 48

Alors là, le docteur Carpenter vient, il nous soumet toutes sortes d'études là. Il ne faut pas... Bon. Ça, c'est des déclarations écrites là qu'on peut assimiler à du voir-dire là, t'sais, ça ne fait pas... Quand on vient me déposer ça d'épais de documents là, ça ne fait pas la preuve de la véracité de ce qui est écrit dans ces documents-là. Ça fait juste la preuve que tel et tel auteurs pensent de telle et telle façons sur ce problème-là, c'est ça. Alors, ça, il ne faut pas confondre le témoignage qu'il vient rendre et la question de son expertise, là on est au niveau de son expertise.

Et quand on dit, on veut le faire reconnaître comme un expert sur les risques de la santé qui sont reliés aux émissions de radiofréquences, bien, comme il n'est pas un clinicien et qu'il n'a pas fait de recherche là-

dessus, c'est bien difficile de le reconnaître comme expert. Je veux dire, qu'il ait une grande expérience sur toutes ces recherches-là, ça va là, mais... en tout cas. J'ai un problème avec ça là.

Me DOMINIQUE NEUMAN :

Mais, justement, vous avez mentionné les différentes recherches, mais ça prend justement quelqu'un qui est au-dessus de cela, qui a une fonction de direction, une fonction de coordination pour pouvoir vous présenter sa vision, son interprétation de ce que cette masse de recherche indique ou n'indique pas.

Justement, la solution n'est pas de venir amener le chercheur numéro 1 de l'article 1 et ensuite de l'article numéro 2, c'est d'avoir quelqu'un qui a cette vision d'ensemble qui puisse vous permettre d'apprécier la force probante ou le pouvoir ou la... que représentent ces recherches, ces recherches qui existent déjà. Donc, les recherches ont été produites, vous les avez. Ça permet de faire contrepoids à ce qui avait déjà été dit antérieurement par le témoin, monsieur Plante, d'Hydro-Québec qui donnait une certaine vision de ce qu'il avait, de ce qui était le résultat global de la recherche. Docteur Carpenter vous donne une

autre vision et il a... et, de par les fonctions qu'il a occupées, l'expérience qu'il a, il a la... il a l'expertise requise pour vous faire cette appréciation-là.

LE PRÉSIDENT :

Je vous vois et je vous entends.

Me DOMINIQUE NEUMAN :

Donc, c'est ça. Donc, je vous soumets que... Bien, de toute façon, les études qu'on vient de mentionner, elles ont été produites. Et comme on pourra le voir, il y a des études qui ont... des résultats - je vais utiliser le terme positif et négatif - ce n'est pas un jugement de valeur, mais simplement pour simplifier la description puisqu'il y a toutes sortes de nuances entre les deux.

Il y a des méta-analyses, comme le docteur Carpenter l'a mentionné, qui font des revues plus globales et qui incluent donc à la fois les... en fait, l'incertitude scientifique. Le docteur Carpenter en fait état dans son rapport et c'est... et je présume qu'il en fera état tout à l'heure, du fait qu'il y a une incertitude scientifique. Il y a à la fois des résultats positifs, mais il y a différentes recherches qui ne parviennent pas à aboutir aux mêmes... qui n'aboutissent pas aux

mêmes résultats, donc on a cette divergence de vue dans la science.

On essaie de l'expliquer, il y a différentes explications possibles qui va être que comment ça se fait que la recherche A donne tel résultat et la recherche B donne tel autre résultat, alors que ça devrait être la même chose. Qu'est-ce qui l'explique? Est-ce qu'il y a quelque chose qu'on n'a pas compris? Le docteur Carpenter pourra élaborer là-dessus. Mais, comme il a mentionné, il y a encore beaucoup d'incertitude dans la science, même sur des choses de base, comme les causes de plusieurs... des cancers reconnus qui existent sont... les mécanismes ne sont pas tous complètement compris par la science. Et donc il y a différentes choses qui ressortent des études.

Il y a une des études où, pour une même recherche, c'est la recherche d'interphone, il y a plusieurs interprétations divergentes de la même recherche. Il y en a qui disaient que ça prouve A, d'autres qui disaient que ça prouve le contraire de A, donc...

Et justement, on a besoin d'avoir quelqu'un qui puisse vous présenter, de façon globale, vu par en haut là, quel est l'état de la recherche et les

commentaires sur ces recherches qui ont été faites, pour que la Régie puisse avoir l'information dont elle a besoin pour qu'elle décide, le cas échéant et sous réserve des questions de juridiction que vous avez mentionnées, Monsieur le Régisseur, s'il y a lieu pour la Régie d'appliquer ou non le principe de précaution et le traduire, en fait, dans des mesures de précaution, comme nous le préconisons.

Donc, je vous demande de reconnaître la qualification d'expert. Mon ordinateur vient... mon image vient de s'éteindre, mais en tout cas, tel que ça a été dit tout à l'heure. O.K.

LE PRÉSIDENT :

Merci, Maître Neuman. Maître Hogue.

11 h 55

ARGUMENTATION PAR Me MARIE-JOSÉE HOGUE :

Alors, peut-être juste rappeler, Monsieur le Régisseur, au départ que le fardeau de vous convaincre que le témoin qu'on vous propose comme expert a les qualifications nécessaires revient à celui qui le présente comme témoin, qui veut le voir qualifié d'expert.

Je n'ai absolument aucun doute que monsieur Carpenter a une belle carrière académique, que

c'est certainement quelqu'un qui est dans le domaine de la santé publique, a fait beaucoup, a réalisé plusieurs recherches, a publié, a dirigé des groupes de recherche. Le problème, c'est que ce n'est pas ça qui nous intéresse ici. Ce qui nous intéresse, et c'est la question spécifique qui a été d'ailleurs posée par la Régie, c'est l'effet des radiofréquences qui sont émises par des compteurs comme ceux qu'Hydro-Québec se propose d'installer.

Quant à moi, il ressort très clairement de la part du témoignage qui a été rendu par monsieur Carpenter qu'il n'a à cet égard-là absolument aucune expertise au niveau des RF. Il n'a pas fait de recherches à cet égard-là. Il n'a pas publié sur ces sujets-là. Il existe des groupes qui ont fait de la recherche à cet égard-là. Il n'en faisait pas partie. Même dans certains cas où c'étaient des organisations avec lesquelles il a pu avoir certains liens, en aucun moment ses services à lui ont été retenus à l'égard des radiofréquences et de l'impact des radiofréquences.

Alors, dans le contexte où vous êtes intéressé par la question de l'état de la science au niveau de l'impact des radiofréquences, le

témoignage de monsieur Carpenter ne se qualifie pas à titre d'expertise. Il n'est pas en mesure de vous éclairer sur cet élément-là.

La seule chose où monsieur Carpenter pourrait être utile, c'est au niveau d'une revue de la littérature, mais parce qu'il semble avoir l'habitude de réviser de la littérature, mais avec égard je doute qu'il s'agisse là d'une expertise. Et surtout il nous dit qu'il n'a pas fait une revue qui soit... j'ai utilisé en anglais « comprehensive review », de la littérature sur le sujet. Il a plutôt utilisé ce qu'il avait. Et à partir de là, on tombe véritablement dans des questions d'opinion de nouveau pour lesquelles il n'est absolument pas qualifié, toujours au niveau de l'impact des RF.

Je voudrais vous remettre copie d'une décision américaine, parce que je pense que c'est mutadis mutandis, la même situation à laquelle on fait face. C'est une décision dans laquelle, qui a été rendue dans laquelle monsieur Carpenter a témoigné. C'est l'affaire Allgood. Et c'est une décision qui a été rendue par l'United States District Court for the Southern District of Indiana dans la division d'Indiana. J'en remets une copie à maître Neuman.

Et vous allez voir qu'on faisait face exactement au même genre de situation. Je vous amène à la page 22 de cette décision-là. Ça n'avait rien à voir avec des RF, mais vous allez voir que, néanmoins, c'est le même type d'analyse qui est fait. Parce qu'il n'y a pas qu'au Canada qu'avant d'accepter d'entendre l'opinion de certaines personnes, on veut s'assurer que les gens qui émettent cette opinion-là devant un tribunal soient des gens qui ont clairement les qualifications nécessaires pour leur permettre de le faire.

Et à la page 22 dans cette décision-là, vous verrez qu'il y avait deux experts qui étaient présentés par ceux qui avaient retenu les services de monsieur Carpenter. Alors, ils présentaient un dénommé Teitelbaum et monsieur Carpenter qui était à ce moment-là identifié... je suis à la page 22 dans la colonne à gauche, le troisième paragraphe, il était à ce moment-là identifié comme étant « environmental health professor David Carpenter ». Et vous allez voir que la Cour ne retient pas le témoignage du docteur Carpenter, ne le qualifie pas comme expert. Et je m'en vais dans le dernier paragraphe en bas à gauche :

GM argues that the court should

> exclude any such testimony by Dr. Teitelbaum and Dr. Carpenter because their opinions do not satisfy the reliability and relevance requirements of Rule 702 [...].

Ce sont, c'est évidemment une règle différente, on est dans un contexte américain, mais ce sont évidemment les mêmes standards qu'ici ou l'équivalent. Ça doit être un témoignage, une expertise qui est fiable et surtout une expertise qui est pertinente.

> Because the court...

Je suis à la fin du paragraphe.

> Because the court finds that Dr. Carpenter's opinion does not meet standards for admission, plaintiffs' medical monitoring claim cannot survive. The court does not reach the question of the admissibility of Dr. Teitelbaum's opinion.

Puis allez par la suite à la page 23. Et je m'en vais à la colonne de droite, le deuxième paragraphe, où on fait état dans un premier temps de tout ce qu'il a fait et, de nouveau, je le répète pour le bénéfice de tous, incluant le

bénéfice de monsieur Carpenter, je ne minimise pas ou ne sous-estime pas ce qu'il a pu faire dans sa carrière. Ce que je dis, c'est que ça n'a absolument aucun lien avec ce qui nous intéresse ici. Alors, si vous allez à la fin du paragraphe.

> Plaintiffs plan to have Dr. Carpenter testify as to the necessity for medical monitoring in this case and as to the components and cost of a proper medical monitoring program. While Dr. Carpenter has extensive experience relating to the study of PCBs...

C'est vraiment ça son champ d'expertise, c'est l'effet de certains produits chimiques.

> ... and their effects, Dr. Carpenter's opinions are not sufficiently reliable and therefore are inadmissible in this case.

Et je pourrais continuer comme ça. Vous avez de nombreux passages. Je vous invite à en prendre connaissance.

12 h 00

À la page 23, à la page 24. Ça va comme ça jusqu'à la page 25. Je vous souligne d'ailleurs à la page 24, dans la colonne de gauche, le

paragraphe où on voit, le troisième paragraphe :

> Dr. Carpenter's assessment, however, is not reliable. Dr. Carpenter failed to use reliable methodology in determining how to rate such levels as either usual or above background levels. In other words...

Et c'est là où je vous dis, le fardeau est toujours au demandeur,

> ... plaintiffs have not demonstrated that Dr. Carpenter employed reliable methodology in determining that "normal" exposure levels are between 0.9 ppb and 1.5 ppb.

Et en haut à droite à la page 24, le premier paragraphe au centre :

> Dr. Carpenter's misapplication of his own source reveals a methodological flaw critical to his opinion of whether plaintiffs' exposure is significant. For example...

Et, là, je saute ce qui reste. Vous pourrez le lire. La raison pour laquelle je fais référence à cette décision-là, Monsieur le Régisseur, c'est qu'on est exactement dans la même situation que

celle qui est décrite là. On ne peut pas compte tenu de l'expérience du domaine d'expertise de monsieur Carpenter penser qu'on peut se fier raisonnablement sur les opinions qu'il peut émettre. Il n'est pas qualifié pour le faire. J'ai bien établi, puis je pense qu'il a eu l'honnêteté de le reconnaître, il n'est pas un médecin qualifié, il n'a jamais fait de clinique, il n'a pas fait de résidence. Alors, tout cet aspect-là est absent.

Au niveau de la recherche fondamentale, parce que je comprends que c'est un chercheur, et j'ai bien du respect pour les chercheurs, en matière de recherche fondamentale, il a fait des grandes choses, mais strictement rien au niveau des RF, si ce n'est le rapport de bio-initiative qui, l'admet-il lui-même, n'a pas été retenu par des organismes publics importants. Il nous réfère à une seule organisation qui aurait supporté ses conclusions tout récemment. Mais il nous dit qu'il a... encore là, je pense de façon honnête, il nous dit qu'il a fait l'objet de beaucoup, beaucoup plus de critiques que de support.

Alors, sur cette base-là, quant à moi, il ne rencontre pas les critères que les tribunaux ont

toujours établis pour qu'un expert puisse recevoir la qualification d'expert. Et je ne pense pas qu'on devrait permettre au docteur Carpenter de témoigner à ce titre-là.

LE PRÉSIDENT :

Je comprends que vous demandez qu'il ne... Maître Hogue, je comprends que vous demandez qu'il ne témoigne pas à titre d'expert, mais vous ne demandez pas que son témoignage soit rejeté du dossier?

Me MARIE-JOSÉE HOGUE :

Ce que je vous dis, c'est que je ne sais pas sur quoi d'autre il pourrait témoigner, parce que la question qui est posée, ça requiert une expertise. Je ne pense pas qu'il a connaissance de faits à l'égard desquels il pourrait témoigner. Alors si, effectivement, il n'était pas reconnu comme expert, je pense que, nécessairement, par ailleurs, son rapport ne peut pas non plus être retenu. Et à moins que maître Neuman nous informe de faits à l'égard desquels il pourrait témoigner, moi, je ne connais pas, là, d'objets à son témoignage qui pourraient être à ce moment-là pertinents.

LE PRÉSIDENT :

Maître Neuman, vous avez probablement une réplique.

RÉPLIQUE PAR Me DOMINIQUE NEUMAN :

Oui, d'accord. D'abord, je vais simplement répliquer au tout dernier propos de ma consoeur en réponse à la question du tribunal. La proposition qu'elle fait, ça me rappelle quelque chose qu'elle avait déjà plaidé un peu plus tôt à propos d'une autre personne dans cette cause. Elle propose littéralement que, si la reconnaissance d'expert n'était pas approuvée, que le rapport soit sorti du dossier. Donc, ça voudrait dire que le docteur Carpenter aurait un statut inférieur à n'importe quel témoin de n'importe quel intervenant qui est venu devant vous, qui témoigne de son opinion sans être reconnu expert sur différents sujets, qui présente un mémoire.

Donc, elle propose que, par le fait d'avoir demandé un statut d'expert, s'il n'est pas reconnu, le résultat, c'est qu'on est moins que n'importe qui d'autre qui a déjà témoigné devant vous, et que ce serait la seule personne dans cette cause qui n'aurait pas droit... dont le rapport serait retiré. Il y a eu toutes sortes de personnes qui ont témoigné devant vous, de différents intervenants, qui ont présenté des rapports où ils émettaient des opinions sur toutes sortes de

choses. Tous ces gens y ont droit. Le docteur Carpenter, parce qu'on a demandé qu'il soit, on demande qu'il soit reconnu expert, là, il aurait moins de droit que n'importe qui d'autre.

Donc, je vais passer maintenant au jugement américain que ma consoeur présente. J'ai lu les passages. Et incidemment je ne sais pas si la copie de la Régie était surlignée en jaune, mais la mienne ne l'était pas. Elle ne l'est pas. D'accord. Donc, j'ai suivi les passages. Et c'est clairement un cas complètement différent. Puis d'abord, il s'agissait de la question des PCBs, ce qui n'est pas l'objet sur lequel porte le témoignage du docteur Carpenter dans le présent dossier.

Également, la demande visait à... la demande des demandeurs dans cette cause était de faire en sorte que deux témoins puissent témoigner sur la composition et les coûts d'un programme de « medical monitoring program », d'un programme de suivi médical. Donc, c'était quelque chose de beaucoup. D'abord, qui portait sur les PCBs, les BPC, qui portait sur les composantes et les coûts prévus d'un tel programme.

Et, en tout cas, à tort ou à raison, je ne sais pas si le jugement a été porté en appel ou

pas, mais le tribunal a jugé que, sur ce sujet très spécifique, les deux... en fait, on parle des deux témoins, je n'ai pas vu ce qui est dit de l'autre témoin exactement, qui n'avait pas, selon l'opinion du tribunal, les compétences pour parler de ce sujet spécifique.

12 h 06

Mais, dans le cas qui nous occupe ici, ma consoeur a laissé entendre que le docteur Carpenter n'avait pas d'expérience ou n'avait pas été retenu sur la question... sur la question spécifique qui nous occupe ici, c'est-à-dire donc les radiations, les radiations non ionisantes et que le docteur Carpenter a présenté qu'il y a un spectre de radiations ionisantes et non ionisantes qui ont différents effets.

Il a travaillé sur ce sujet. Il a été employé, d'abord par l'armée américaine sur ce sujet, ensuite par l'État de New York sur la question des lignes, des lignes à haute tension. Il a publié deux livres qui portaient spécifiquement sur les champs électromagnétiques. Il a donné... Bon. En plus de ça, il a coordonné le rapport bio-initiative sur ce sujet. Il est en train d'écrire un chapitre qui est déjà rédigé et qui doit

paraître très prochainement dans un « text book », donc un manuel d'enseignement pour les étudiants spécialisés dans ce domaine, sur les champs électromagnétiques, c'est sur ce sujet que ça porte.

Et donc, ça implique aussi que les organismes, l'organisme qui l'a choisi pour écrire ce chapitre de ce livre a dû le reconnaître comme expert. L'armée américaine, quand on l'a employé, a dû reconnaître son expertise dans le domaine. L'État de New York qui non seulement l'a engagé pour coordonner des études, mais ensuite il a été le représentant de l'État de New York sur le sujet. Donc, quelqu'un a dû le reconnaître comme avoir une... ayant une expertise suffisante sur la question.

Et ça, c'est en plus des nombreuses publications, des revues, de la littérature qui sont publiés dans des « peer-review journal », des journaux qui sont revus par des pairs. Si ces pairs avaient jugé que la publication que le... les publications que le docteur Carpenter faisait n'étaient pas... n'avaient pas de valeur, ils ne l'auraient pas publiées parce que, par définition, ce n'est pas volontairement qu'on peut aller

publier dans ces revues-là. Il faut d'abord qu'on soit approuvé par un Comité de lecture des pairs, donc...

En plus de ça, il y a les différentes conférences qu'il a faites. Il a siégé sur des comités, des comités, il a mentionné des comités dont le nombre de personnes est très restreint. Là encore quelqu'un a dû reconnaître sa valeur pour l'engager sur ces... le nommer sur ces comités. Donc, je vous soumets que sur la question spécifique des radiations, radiations ionisantes et non ionisantes, il a les compétences requises.

Et en plus, quand on parle des effets de ces radiations, on parle du cancer, des effets sur... des effets neurologiques, son curriculum vitae regorge d'études publiées dans des revues dirigées par des... supervisées par des pairs sur ce sujet. Donc, le sujet n'est pas la cause en soi, le sujet, quand on parle des effets sur la santé, on parle des effets des radiations sur quelque chose. On parle des effets des radiations sur le cancer, des effets des radiations sur les fonctions neurologiques, sur... parmi le cancer, sur la leucémie. Il a mentionné qu'il avait coordonné une étude visant à répliquer, à la demande de l'État de

New York, la première étude qui avait été faite dans un autre État, pour s'assurer que les résultats étaient reproductibles et l'ont été.

Puis là encore, c'étaient des effets des radiations sur le cancer. Il a parlé de différents types de cancer, leucémie ou cancer chez les enfants, cancer chez les adultes. Donc, il a travaillé spécifiquement là-dessus.

Je vous soumets que la reconnaissance que nous demandons devrait être... devrait être accordée.

LE PRÉSIDENT :

Merci, Maître Neuman. On va ajourner pour le déjeuner, je vais penser à ça pendant le déjeuner. On va reprendre à une heure trente (13 h 30). Si je n'ouvre pas la porte à une heure trente (13 h 30), c'est parce que j'y pense encore.

SUSPENSION

13 h 30

REPRISE DE L'AUDIENCE

DÉCISION :

Voici la décision. On demande à la Régie de reconnaître le docteur David Carpenter comme témoin expert en médecine, c'est-à-dire témoin expert médecin en santé publique, incluant les risques de

santé associés à l'exposition radiofréquence... c'est-à-dire à l'exposition aux émissions de radiofréquences au présent dossier, c'est-à-dire les émissions de radiofréquences qui sont reliées aux compteurs nouvelle génération.

Alors, je ne peux pas accorder un statut, je ne peux pas accorder le statut d'expert tel que demandé. Monsieur Carpenter n'est pas médecin en santé publique. Il n'a pas d'expérience clinique, c'est-à-dire qu'il n'est pas un médecin qui a des contacts directs avec des patients. C'est ça une expertise clinique. Il n'a pas non plus personnellement d'expertise clinique ou en recherche sur les effets des radiofréquences sur la santé.

Alors, il est difficile dans les circonstances de lui reconnaître le statut d'expert demandé sur les risques de santé associés à l'exposition aux émissions de radiofréquences. Je dois cependant reconnaître que monsieur Carpenter a une grande expérience en matière de santé publique. Ça, il n'y a pas de doute.

Il ne serait pas utile de lui accorder un statut d'expert aussi général qu'expert en santé publique, car cela ne lui conférerait pas

l'expertise pointue pour répondre à la question que la Régie a posée, c'est-à-dire faire le statut de la recherche scientifique sur la question de savoir si les émissions de radiofréquences des compteurs nouvelle génération en question peuvent constituer un risque de dommage grave ou irréversible pour la santé.

Cela étant dit, je ne vais pas rejeter pour autant son témoignage qui fait, en fait, le bilan des recherches faites par d'autres. J'ai référé ce matin aux attentes de la Régie sur le rôle des témoins experts dans la lettre de transmission aux participants de ces attentes, une lettre de juillet de l'an passé, deux mille onze (2011) que l'on retrouve sur le site de la Régie de l'énergie. La Régie précisait ceci, et je cite :

> La grande majorité des témoins qui se présentent devant la Régie sont des personnes d'expérience ayant une certaine spécialité dans le secteur de l'énergie. La Régie reconnaît que ces témoins, analystes ou spécialistes, qui agissent comme représentants d'un participant puissent donner leur opinion même s'ils ne sont pas

> reconnus comme témoins experts. En fait, la Régie n'applique pas la distinction juridique traditionnelle entre le témoin de faits et le témoin d'opinions ou le témoin expert. La Régie fait cependant la distinction entre, premièrement, le témoignage d'un analyste ou d'un spécialiste qui fait valoir le point de vue d'un participant et, deux, le témoignage d'un expert. Elle tient à rappeler que le participant qui désire faire valoir son point de vue en faisant témoigner un analyste ou un spécialiste n'a pas à demander la reconnaissance de statut de témoin expert pour cette personne.

Alors donc, je rejette la demande de reconnaissance d'un statut d'expert de monsieur Carpenter. Néanmoins, j'accepte son témoignage sujet à la décision à intervenir sur la force probante à accorder à un tel témoignage. Voilà, c'est la décision. Alors, Maître Neuman, vous pouvez faire entendre monsieur Carpenter.

Me DOMINIQUE NEUMAN :

Je vous remercie, Monsieur le Régisseur. Une

question cependant que je demanderais au tribunal. Est-ce qu'il serait possible de le reconnaître expert sur l'état de la recherche sur le sujet?

LE PRÉSIDENT :

Je viens de rendre ma décision sur ce qui avait été demandé. Je pense que ça clôt la discussion. Je viens de dire qu'on accepte que les gens nous donnent des opinions. Je sais que monsieur Carpenter est au fait de la recherche qui a été faite par d'autres. Alors, je l'accepte comme tel. D'accord. On n'a pas besoin d'étiqueter le témoin expert pour ça.

Me DOMINIQUE NEUMAN :

D'accord. Je vous remercie bien.

13 h 35

PREUVE PRINCIPALE

EXAMINED BY Me DOMINIQUE NEUMAN:

Q. [160] So, Mr. Carpenter, so I will ask you to present your report. And I'll ask to you present it generally, and then I may ask you certain questions on more specific subjects.

A. Well, let me begin by a discussion of studies that have been done, of people that live near to AM-FM, television, cell phone towers, transmission towers,

where individuals are exposed by virtue of where they live to a variety of different continuous radiofrequency radiations. Now, these studies have no measure of exposure other than the fact that they lived near to a transmission facility. And there are a number of such studies. The ones that are... the strongest, I should also say, that not every study have shown statistically significant relationships, but the majority of them have. And I will summarize those briefly.

There is a study from Brazil, it's... in my report, it's number 38 a., that looked at cancer rates among people that lived near a cell phone tower. Now, they compared the death rate and the death rate from cancer of people living close to the tower as compared to people living further away. And in this case, they documented in their study that they're the same social economic status, they did not find other differences. But they did find significant elevations in both total death rate and specifically of cancer.

The second study is a study of two communities in Austria, where again, they looked at rates of cancer in people living close to facilities as compared to people living further

away. They found significant elevations in the risk of breast cancer and brain cancer. And in this case they had a good dose-response relationship, which is to say the closer you lived to the tower, the greater your risk. The further you lived away, the lower the risk.

Now, in all of these studies, there are some limitations of the exposure assessment. You're not directly measuring the fields, but it is certainly well-known from other studies that the intensity of exposure decreases as you go further away.

The third article on this list is the study of people in Rome that live near to Vatican Radio. Vatican Radio is a very powerful AM radio transmission tower, and in this case they show statistically significant elevation in rates of childhood leukemia in people living close to the towers compare to people living further away.

There have been two studies from Korea, very similar, one by Ha, one by Park as first authors, looking at rates of leukemia, particularly rates in children, in relation to living close to the AM radio transmission towers. Both show higher rates and higher mortality of children living close

to those towers.

Now, there are a number of older studies which I've listed. I don't intend to talk about each of them individually. I think they are not as well done, but they all do report of the five more that I've listed, do report elevated rates of cancer. Now I should say, although it's not on this list, there's at least one study from Germany that did not find elevations in rates of cancer. Let me summarize these studies. They have poor exposure assessment because there's no measurements of the radiofrequency fields. There's only residential proximity to the sources. But residential proximity is a pretty good indicator of what the exposure would be. In none of these studies was there a systematic analysis of other possible differences, but since they were looking at people in the same community, they all, although they discuss other confounders, we would say, other factors that might explain differences in rates of cancer, they did not identify any that could explain the results. So, while some of the older studies in my judgement are relatively weak, I think the newest studies are relatively strong.

Now, these studies are interesting in

relation to what I'll go on to talk about, which are the cell phone use studies. This is the same cancer that we've demonstrated in multiple studies to arise from exposure to power line fields, the extra low frequency fields. In this case, because it's residential proximity, close to a radiofrequency transmitter, it's the whole body that's exposed. And these studies, allow me to extrapolate to the issue of other exposures, in this case particularly smart meters, where it's likely that the whole body would be exposed.

13 h 42

And therefore, the cancer of greatest concern in my judgement is leukemia, and particularly leukemia in children.

Now, let me move on, it's in my report under number 39, I think the strongest evidence for harm to humans from radiofrequency fields comes from studies of individuals that have used cell phones for a long period of time and rather intensely. And as with the power line fields, since there have been quite a large number of studies here, the ones I will focus on primarily are the meta-analyses, the studies that have looked at the literature from all of the studies that have been

done and have drawn a summary conclusion. Hardell, under 39 a., performed a meta-analysis of cell phone use and brain cancers. Now, Hardell himself is an investigator that has published a number of research reports of his own, but in this case, he includes his studies along with all others and he concludes that individuals that have used cell phones for ten (10) years of more, these are adults, have a doubling of the risk of developing a brain cancer, but only on the side of the head where they usually the cell phone. Myong is...

Q. [161] Dr. Carpenter, what is the technical term that we might use in these reports to describe that side of the head?

A. Ipsilateral. Yes, ipsilateral, same side in comparison to controlateral. And in the Hardell review, there was no significant elevation in rates of controlateral brain cancer. And that, in itself, is a very important control because there are limitations in all of the cell phone studies. Again, most people are not going to recall accurately how often they used a cell phone ten (10) years ago. In most of these cases, there's not direct documentation from the communications company about how much use there was. So, the

exposure assessment is not very good, but the fact that the brain tumors are occurring on the side of the head that people traditionally use... habitually use the phone is a good control.

Now, I should actually talk about Levis, which b. under 39 This is a review of the literature on cell phone use and brain tumors. And this study focused particularly on whether positive results were found in studies depending on whether there was a built-in bias or errors in the exposure assessment. They don't give a specific odds ratio but they find that studies that are most free from bias and from errors in project design are leading to the highest odds ratio, the greatest risk, and that studies that did show bias tended to not show such strong results.

Myung, a study from the U.S., a review of another meta-analysis, a study where four hundred and sixty-five (465) publications that reported on twelve thousand (12,000) cases of cancer and twenty-five thousand (25,000) controls, this study found an odds ratio that, being this ratio of use, of two point one eight (2.18) very similar to the Hardell study, for use of ten (10) years or more. It found an elevated risk of one point eight two

(1.82) for use for sixteen hundred and forty (1,640) hours or more. And a risk of one point three one (1.31) for more than two hundred and... I'm sorry, I'm reading from the wrong one, that's under the Interphone study. To go back to Myung, this was a review of four hundred and sixty-five (465) publications and their overall risk was one point eight (1.8) for developing brain cancer. And that didn't distinguish ipsilateral and controlateral.

Now, I started to give results mistakenly on the Interphone study and that merits some detailed discussion. The Interphone study was co-sponsored by the World Health Organization and European cell phone companies. It was done in thirteen (13) different countries, including Canada, but not including the U.S. There was a committee of individuals responsible for the design and implementation of this project, but than other individuals identified in each of the thirteen (13) countries. And the concept of the Interphone study was a very good one. It was to be large, it was to be very international, and it was to be the definitive study that answered the question of: Do cell phones cause cancer? There ended up being

great division among the members of the committee on the Interphone project. And I believe it was more than four (4) years, three and a half (3 ½) or four (4) years after the data collection was completed, that no reports were coming out, until a new director was appointed at the IARC, the International Agency for Research on Cancer, and basically told these people they had to publish their results.

13 h 48

The result was a publication, this was in the International Journal of Epidemiology in two thousand and ten (2010). A publication where in the abstract one of the lead statements was that there was no difference in the rates of brain tumors in people that use cell phones, that did or did not use cell phones. Actually, the results tended to show that people that use cell phones had lower incidents of brain cancer than those that did not. And this, obviously, made no sense. Hidden away in an online appendix were the results that I quoted you, that a significant elevation of two point one eight (2.18) fold for using a cell phone ten (10) years or more, almost identical to what we have in these other meta-analysis. An elevation of one

point eight two (1.82) for using a phone for more than sixteen hundred and forty (1,640) hours, or more, an elevation of one point three one (1.31) for using a cell phone for more than two hundred and seventy (270) calls.

Now, I think this, first of all, was deceitful. And there have been analysis and critiques of this Interphone study by many people. There clearly was some flawed design at the beginning of that study. Nobody would argue that having ever used a cell phone reduces your risk of brain cancer. Nevertheless, when they looked at those people that used phones extensively for long periods of time, then they found a clearly elevated risk. So, in my judgement, the numbers they did find are almost certainly underestimates of the true risk that would have been found had there not been some error, and nobody quite has identified what that might be in the original design of the project.

Me MARIE-JOSÉE HOGUE :

Je vais faire une objection, ici. Je ne vais pas la faire à chaque fois. Je vais simplement, parce que je veux qu'elle soit bien notée au dossier, je vois que ca va plus loin que strictement la revue de la

littérature, en ce sens que monsieur Carpenter émet son opinion quant à ce qu'auraient pu être les résultats si les choses avaient été faites autrement. On traverse la ligne, à ce moment-là. Alors, je veux faire l'objection, qu'elle soit notée. Je prends pour acquis qu'elle vaudra pour l'entièreté du témoignage, mais je veux être sûre que par la suite, on ne puisse pas me dire que ne m'étant pas objectée, que tout ca est à ce moment-là retenu et permissible, là.

Me DOMINIQUE NEUMAN :

Monsieur le Régisseur, je vais répondre à ca. Dans... I'll say it in English. In the exhibits that I filed, we... Because the Interphone study created a controversy and there were articles, articles published by both the authors of the report, who acknowledged the problem, they acknowledged both that, as it can be seen in the documents, that some results showed lower cancer rates, some results showed a higher cancer rate. The authors themselves dismissed their own findings by saying that the ones that showed higher cancer rates, "we were biassed". The authors themselves blame themselves for having... for their own results. There were other articles that said, "No,

bias does not explain the result", and that came from the World Health Organization, it's in the documents that were filed. The World Health Organization, which was the sponsor, said, "No, you cannot just explain by bias the positive results that you found", and maybe we could go to these documents. So it's, there was really a controversy, it's not just one isolated person making a comment, it's the whole scientific community that was divided on this Interphone study, and it appears in the documents themselves.

So, maybe if... What I could suggest is for the Dr. Carpenter to go to the exhibit where the interphone documents have been deposited. For the Régie, it's Exhibit... I'll give the full number, C-SE-AQLPA-0091, SE-AQLPA-7, document 20. And under that exhibit we have several documents which come from various... both the authors themselves, there's two documents from the authors themselves, one document from WHO, one document from another group of scientists, which is the BioInitiative Group, who commented on these results. At a certain point there was a debate on accessing the data, as Dr. Carpenter mentioned.

13 h 55

LE PRÉSIDENT :

Q. [162] Dr. Carpenter, could you put on your headphones? Comme vous n'avez pas été reconnu comme un expert vous-même sur les effets des radiofréquences sur la santé, là, on vous a permis de faire un bilan de la recherche scientifique sur cette question-là. Alors, on vous demanderait de procéder à faire un bilan, sans nécessairement faire de commentaires sur est-ce que telle recherche c'est correct ou ce n'est pas correct. La question qu'on se pose c'est quel est l'état de la recherche scientifique sur cette question-là qui est, de toute évidence, controversée? Alors, c'est ce qu'on vous demande de faire et non pas embarquer dans des commentaires qui dépassent... qui relèveraient des auteurs ou des spécialistes en effets des radiofréquences sur la santé.

Me DOMINIQUE NEUMAN:

Q. [163] Yes, but I'll ask you, Dr. Carpenter, to inform the Board of the existing publications, the existing articles, by which... both from Interphone Group and the ones that have been filed, by which other scientists comment on the Interphone Group results and the Interphone Group also comments on their own results. So, I will ask you to inform the

Board of this existing literature.

A. Well, respectfully, I have some difficulty knowing exactly what you want. So, please, stop me if I'm exceeding what you are asking about.

There have been numerous individuals and numerous agencies that have commented on the Interphone study. The World Health Organization officials themselves have called it inconclusive. Many other people, in reports that are documented, that are included as appendices to my report, have concluded that it is strong evidence, consistent with the meta-analyses I've already described, showing that long-term use of cell phones, primarily ten (10) years or more, increases the risk of cancer of the brain, specifically of gliomas, and specifically only on the side of the head that the phone was used. Most studies have not shown elevations in risk of other brain cancers, meningioma is a case in point, which, once again, provides support for this being a true effect.

I've already commented that exposure assessment was limited and the World Health Organization in two (2) papers, of which - I don't think they're included here -- but Cardis was the lead author -- looked at biasses, recall bias and

exposure bias, and concluded that the results could not be explained by those kinds of biasses.

Beyond that, it is controversial. The document, as it was published in the International Journal of Epidemiology, if you read the printed version, you would conclude that there is really nothing to worry about. If you look in the appendix, then you find quite a different story.

Q. [164] Dr. Carpenter, I would like to describe the various documents that are constitutive of Exhibit C-SÉ-AQLPA-0091, SÉ-AQLPA-7, document 20.

A. Let me be sure I have that one.

Q. [165] It's SÉ-AQLPA-7, document 20, and the Régie's quote is 0091.

A. 0091. Of course I have too many things open on my computer.

There was an editorial in Lancet Oncology that...

Me DOMINIQUE NEUMAN:

Mr. Régisseur, I'm not sure if you have access to this document on... c'est SÉ-AQLPA-07, document 20, 0091.

LE PRÉSIDENT :

Est-ce que ça fait partie des documents que j'ai reçus ce matin? C'est une pile de six (6) pouces

d'épais. Je n'ai pas lu ça, moi.

Me DOMINIQUE NEUMAN:

I think so. I think so, otherwise, I'm sure it's on the internet.

LE PRÉSIDENT :

Quel numéro?

Me DOMINIQUE NEUMAN :

0091. Vous l'avez en papier?

LE PRÉSIDENT :

Oui, je l'ai ici.

Me DOMINIQUE NEUMAN :

O.K.

A. This is a particularly important document because it's written by the Interphone Study Group themselves. The panel of experts that were charged with the development of this research program in thirteen (13) countries. And this is an editorial that summarizes the results. And let me read from one section which I've highlighted there because I think it states where this group of experts come from.

Q. [166] First, just so that we know, the first document you're talking about is the one from Lancet Oncology?

14 h 00

A. Lancet oncology first author is Baan.

Q. [167] And it's... Baan is who compared to?

A. Baan was the Chair of the Interphone Study Group that was responsible for administration of this project.

Q. [168] Okay.

A. And let me quote,

> "Although both the Interphone Study and the Swedish pooled analysis..."

those are the reports of Hardell at all that I have already referred to, both,

> "... are susceptible to bias due to recall error and selection for participation, the Working Group concluded that the findings could not be dismissed as reflecting bias alone, and that a causal interpretation between cell phone, RF/EMF exposure and glioma is possible. A similar conclusion was drawn from these two studies for acoustic neuroma, although the case numbers were substantially smaller than for glioma."

And I should describe acoustic neuroma. It's a benign tumor of the auditory nerve, but it's not

really benign because the auditory nerve is enclosed in bone and so as it grows you lose hearing and can suffer severe pain. To continue with the quote,

> "Additionally, a study from Japan found some evidence of an increased risk for acoustic neuroma associated with ipsilateral mobile phone use."

So I think that my comments that this was a positive study are, those comments are consistent with the conclusion of the main authors of the Interphone program.

Q. [169] Okay. The next document in that, within that exhibit.

A. The next document is a statement from the BioInitiative Group and it's under the address of the Institute for Health and the Environment at the University at Albany in my role as the chair of that committee and this comments on the release of the, the final release of the ten (10) year long Interphone study and it has a number of comments by authors. Let me read one from Michael Kundi who is the head of the Institute of Environmental Health at the Medical University of Vienna. He says,

> "The authors emphasize that no increased

> risk was detected overall. But this is not unexpected. No exposure to carcinogens can cause solid tumors like brain cancer or lung cancer, for example from tobacco to asbestos, have ever been shown to significantly increase cancer risk in people with short duration of exposure. The latency period for brain cancer is fifteen (15) to thirty (30) years.

The Interphone study lends support to previous studies from Sweden. Dr. Hardell, who is a practising oncologist quotes,

> "The final INTERPHONE results support findings from several research groups including our own, that continuing use of a mobile phone increases risk of brain cancer. We would not expect to see substantially increased brain tumor risk for most cancer causing agents except in the longer term, ten (10) years or longer, as is the case here in the population of regular cell phone users. The participants included in this study were thirty (30) to fifty-nine (59) years old, excluding younger and older users. Use of cordless

phones was neglected in this analysis. Radiofrequency radiation from cordless phones can be as high as mobile phones in some countries so excluding such use would underestimate the risk."

Q. [170] Okay. The next document is from the BioInitiative Group, December third (3rd) two thousand eight (2008).

A. And this was a memo sent to the principal investigators of the Interphone study groups and this was a plea that they published the results and that they enable scientists and other experts not directly involved in the Interphone studies to get the whole pattern of results without further delay. And this was signed by all of the authors of the various chapters of the BioInitiative Group. And it includes exhibits that report on what studies have been published and have not been studied, published from the different countries. There were few publications from Japan, from France, from Germany, from the U.K., from Denmark, Finland, Norway and Sweden. None in this case from Canada, from Australia, from several other countries.

Q. [171] Thank you. And after that there is a document described as Appendix Table 1?

A. Appendix Table 1...

Q. [172] This is from whom? Who is, this document is coming from whom?

A. This is the, this isn't the document coming from the Interphone appendix. The appendix that was in the, the electronic appendices to the paper. And this appendix looks specifically at meningioma cases in relation to outcomes of, it looks at glioma cases in relation to outcomes and controls. And then in the Appendix table 2 it looks at the rates, the odds ratios, for meningioma and for glioma on the side of the use of the cell phone and provides the overall odds ratios for each.

14 h 08

Now, meningioma, there were no statistically significant elevations in odds ratios. Although, for some of the higher uses, there were elevated odds ratios, they just were not statistically significant. For glioma, there were statistically significant elevations in risk for ipsilateral use, one point two seven (1.27) odds ratio. For regular users, one to four years before the reference date, one point two three (1.23) was the odds ratio. For regular users five to nine years before the reference date, one point three

four (1.34) is the odds ratio. And for regular users ten (10) years or more, one point two four (1.24) is the odds ratio.

Then they go on, in appendix table 3, to look at hours of regular use. And the numbers I gave you earlier for glioma, for six hundred and forty (640) hours or more, an elevated risk of almost two, one point nine five (1.95), statistically significant.

For digital phones, and this is very interesting, and I hadn't commented it earlier, that a digital phone, one of the handsets you pick up and walk away from the base, actually generates fairly significant radiofrequency fields, and Hardell's group has shown elevations in rates of glioma with digital phones and in this study they did have significant elevations with more than one thousand six hundred and forty (1,640) hours of use of a digital phone. The odds ratio, one point eight four (1.84).

Then, the Appendix table 4, excluded the results from different countries and basically found that that didn't change the overall conclusions in any way.

Appendix table 6 breaks the results down by

country, and obviously when you break them down by country you have smaller pools, so fewer of those are statistically significant by themselves, but that's why there's power in the aggregate data.

Q. [173] I see these appendices are dated two thousand ten (2010), and the earlier document was the request for data that the BioInitiative Group has sent in two thousand eight (2008). Were these appendix, the data that you were looking for or was it something else?

A. Well, the data that we were looking for, we really never got, which was all of the original data. We were not unhappy with the publication in two thousand and ten (2010) that included this analysis. And our letter of two thousand and eight (2008) was basically expressing our frustration that nothing had been published. So, we did not receive all of the original data. Had we received that, we would have analysed it ourselves and published if we had found significant results.

Q. [174] After that, there's a document named Appendix 2?

A. Now, Appendix 2 is an attempt to determine whether some of these biases that I've already discussed, bias in recall or bias in selection of the

participants, whether bias could explain away these positives results.

Q. [175] Just before we go any further, when you say "this bias", are we talking of the bias that the authors identified themselves, or bias that other people identified against them? What bias are we talking about?

A. We're talking about biases in the experimental design that would have led to an artifactually positive result. And there are clearly some opportunities for bias here. When you're getting self reports of how frequently you used your cell phone ten (10) years ago, that is unlikely to be remembered very accurately. And it may be, for example, that someone that has a brain tumor is looking for an explanation for their brain tumor, and therefore would report a greater use than someone that doesn't have a brain tumor and doesn't have any motivation to exaggerate. But the... And that had been raised earlier in the report I mentioned from Dr. Cardis, who had been the administrator of the Interphone study, and in her report she did not find evidence of any of these biases. This was an appendix to the Interphone report because the question of bias had been

raised. It was one of the major reasons that the greater committee had delayed the publication, because they couldn't agree amongst themselves as to whether biases would be the explanation for their findings.

14 h 14

The conclusion from... this is a rather long appendix and it's... let me just read the conclusion,

> Analyses excluding never regular users of mobile phones may have reduced downward bias in odds ratios from an angiomeningioma due to selective non-participation of people who were never regular users. There is evidence however of persisting bias in the results of these analyses and it is possible that the exclusion of never regular users has produced upward bias in the odds ratios, particularly for glioma. Does biasses and error prevent a causal interpretation of these results?

And I concur with that observation. Just because one sees associations in study after study and in

meta-analysis does not prove that the radio frequency radiation cause the glioma. However, it is consistent with that conclusion and that is the reason why I call for precaution. We don't have all of the answers. There are clearly biasses in this study or flaws in the study design that leave the study and its results open to some debate. But nevertheless, the overall results are consistent with investigations in other countries, particularly the studies of Hardell et al. And because the use of a cell phone is exposing a person to radio frequency radiation, may not be exactly the same frequency as you would have from smart phones. But in my judgement, this is our strongest evidence for hazards from radio frequency radiation. And because, as with any environmental exposure, what is really critical is not a single high-intensity exposure, which you do get if you talk on a cell phone and hold it to your ear, but it's the aggregate exposure over seven days a week, twenty-four (24) hours a day, year after year after year. And while the latency for leukemia is usually given as something like five to fifteen (15) years, the latency for brain tumours are usually given as fifteen (15) to thirty (30) years. So this

aggregate exposure is what we're concerned about.

Now, I said earlier there has never been a study of health outcomes specifically from smart phones, they haven't been around long enough. And even people that have had them for maybe five years have not been exposed long enough to show the diseases of concern. There's nothing uniquely bad about smart phones. What is of concern is that they add to the exposure to radio frequency radiation that is already existing from multiple other sources. And what we're asking, Hydro-Quebec and other utilities to do, is to recognize that there is very likely -- in my judgement, it's more strong than very likely but -- to be cautious on it, it's very likely that there is harm from excessive exposure to radiofrequency radiation, and therefore, we should do whatever we can with whatever wireless radio frequency source we have to minimize the exposure while at the same time we don't prohibit the development of technology that makes things more efficient.

Q. [176] Dr. Carpenter, I'll go to the next document, which is a publication in the International Journal of Epidemiology 2010. The article's title is "Teen cancer (...) risk in relation to mobile telephone

use."

A. This is the article that we've been discussing and I think it would be informative if I read the conclusions of the original published article,

> "Overall, no increase in risk of glioma or meningioma was observed with the use of mobile phones. There were suggestions of an increased risk of glioma at the highest exposure levels, but biasses and error prevent a causal interpretation. The possible effects of long-term heavy use of mobile phones requires further investigation."

Now, I basically concur with that statement. Where I would raise a question is, first of all, in biology and medicine, we never absolutely prove anything to one hundred percent (100%) certainty, that's why we talk about results in terms of odds ratios, we talk about confounders and biasses. And you can prove a physics theory, a mathematical theory to one hundred percent (100%) certainty, but you can't ever prove that, for example, smoking causes lung cancer to one hundred percent (100%) certainty.

So, I think this idea of concluding that

there's a causal relationship is unrealistic to start with. And this study is consistent with there being a strong association for brain tumors on the side of the head that we use the phone, and whether that's causal or not, to some degree, is almost irrelevant. The association is strong. It must be some component of the use of a cell phone that is associated with the development of these tumors.

14 h 20

And therefore I think this again argues for the precautionary principle and doing what everyone can to reduce exposure.

Q. [177] I'll switch, well, I'll switch right now and you can... We can go back later on the next paragraph of your report but I'll switch immediately to the U.K. Health Protection, I'm sorry, the AGNIR Report, for the record it's exhibit C-SÉ-ALQPA-007 Document 22, zero, it's, the Régie's quote is 0093. I am not sure the paper version is out yet, it's only on the internet right now, so it's, it's not in the paper, Mr. Commissioner, it's, I don't think the paper version has, is out yet. It's only on the internet. 0093. But could you describe what we can see, like the AGNIR report and what we can see on the

excerpts from that report that you filed.

There's... I think it's a long report of three hundred (300) pages but I think...

A. It's a very long report.

Q. [178] ... you took only a part of these three hundred (300) pages.

A. Yes. This is a very long report and it's one that overall minimizes the dangers from radiofrequency radiation. However, the summaries of this report all acknowledge that nothing has been proven to be safe. They argue that we haven't proven hazard but clearly states that nothing has been proven to be safe. And my take home lesson from that again falls back to the precautionary principle and it, of course, is very difficult to prove something is safe. But it's also very difficult to prove something is hazardous, and this report reviews many of the same references that I have referred to and it concludes that the results are inconclusive. Well I don't quite agree with that but I think this report, while it's long and difficult to read, is consistent with a call for precaution in radio frequency exposures.

Q. [179] Yes. In the exhibit that was, that is filed, which is ninety (90) pages out of this three

hundred (300) pages, we see a succession of tables.

A. Yes.

Q. [180] On various health effects.

A. Yes. These are, there are many, many tables, it goes on and on for ever and ever.

Q. [181] Yes. And it is tables, it is lists of studies?

R. Yes.

Q. [182] Each table is on a specific subject and enumerates a certain number of studies that were examined?

A. And after, at the end of each of these references...

Q. [183] Yes, but...

A. ... there's a blank that basically says give yes or no in terms of there being significantly reported effects. And if one looks down these multiple tables, the yesses and the nos are about equal. Now it is not appropriate, in concluding whether or not something is hazardous, to simply count the positive studies and the negative studies and not critically review them, but this report certainly does not document that there is a lack of adverse effects. Their tables are on human health effects, studies on cells, studies on animals, and it's a

fairly systematic accounting of the literature. But on the section that I am looking at for example, there are six yesses, three nos. If I go a little further there may be four nos and five yesses. So there are...

Q. [184] I'm sorry, could you indicate the page number which is at the bottom of the page each time you...

A. Okay. I just move pass that one so...

Q. [185] ... of the page itself, on the document itself.

A. I am on page 19 of 90, this is...

Q. [186] Yes.

A. ... gene expression.

Q. [187] No, the page of the, well, yes, the page of the document itself.

A. Page 19.

Q. [188] Not of the exhibit but...

A. Oh.

Q. [189] The page number which is written on the text of the report.

LE PRÉSIDENT :

Pardon, vous êtes à quelle pièce?

A. Page 96.

Q. [190] 0099 non?

Me DOMINIQUE NEUMAN:

Non, 93.

LE PRÉSIDENT :

93.

A. No, gene expression in my judgement is not one of the...

Q. [191] Which number was it? I didn't...

A. 96.

Q. [192] 96. Okay.

A. And it lists I believe twelve (12) studies, thirteen (13) studies, where it looks at building of radio frequency fields to induce genes. And in this particular case...

Me DOMINIQUE NEUMAN :

Q. [193] Just a second, we will wait until the Board and the Commissioner, ninety... which page?

A. 96.

Q. [194] 96.

14 h 26

A. In this particular case they're looking at studies, these are all different studies, they're studies of different cell types and they're asking whether or not exposure to radiofrequency radiation changed the expression of different specific genes. The first study is Capri et al, two thousand and six (2006), and they say, "yes, these are studies of

lymphocytes, human lymphocytes", and they report that one specific gene was down regulated. That means the gene caused less production of a particular protein. The next study, Tuschl et al, two thousand and six (2006), was not positive. This looked at regulation of genes in monocytes. The next one was positive. It showed increased protein synthesis in lymphoblastoid cells. The next was positive, it showed that nerve cells showed twenty-four (24) genes that increased and ten (10) genes that decreased. The next study was negative, it was on astrocytes, glial cells in the brain, and found no changes in the cytokines.

So, I think the point is that each of these studies is different. You can't say that any is a replication of a previous study. Now, the point here is that some people find statistically significant results in one study system. Other people using a different study system do no find significant results. We wouldn't really expect significant results in every circumstance. Again, the cancers of concern are leukemia and brain cancer. And that's why a lot of the studies have been on lymphocytes or neurons. And some show the gene that they are looking at is altered, some show

it is not. And this report is quite encyclopedic for the studies have different sorts, and giving this yes versus no kind of answer.

Q. [195] We can continue at the next page, to have an outlook.

A. Now, this is stress proteins, especially heat shock protein. This has been one of the effects of radio frequency field and also ELF, that has gotten a lot of attention because there are a number of reports and replications of changes in heat shock proteins. Now, glancing down here, it's "no, no, yes, no, no, no, no, no, no, no, no, no, no, no, no, no, no". So, a lot of studies did not show elevations in heat shock proteins. One did. Now, they're studying different cells. The yes was a study of lymphocytes. Some of the nos were studies of macrophages and monocytes, so again, in this particular list, there are not replication studies, which you would like. You'd like to see when two different laboratories study the same cell, they get similar results. And those are not present here.

Q. [196] And the next page, which is the continuation of the same table?

A. Yes. "No, no, yes, no, yes, yes". And these are all

recent studies, two thousand six (2006) onward, while there's one two thousand and three (2003). But they're studies of different cell types, and again it shows the... I don't call this a lack of consistency, it's not that because these are all different laboratories studying different cell types. And it shows that some show that genes are induced, and others do not find that the gene they study and the cell they study is induced.

Q. [197] The next page, or is there another section of the report you want to discuss?

A. I'm not sure there's so much value in going through all of these sections, because they look at studies looking at different outcomes. The next one, intracellular signalling, and then they have one on membrane effects. This is sort of, again, an encyclopedic analysis of the different studies that have been done.

Q. [198] Okay. Just an example, which is table 3.6, the membrane effects, which is I think a few pages... It's the page which is number 102.

A. Yes. And this is something I haven't really spoken to yet, but while in my judgement, cancer is of greatest concern, there is a significant body of evidence where I see the weight of evidence to

argue that radio frequency radiation reduces sperm count in men, and therefore contributes to infertility. And there is also some evidence for effects on the nervous system that we'll talk about a little later. But the table 3.6 looks at a variety of cells. They didn't find effects on glial cells in the brain. They did find effect in one study from... I believe it's from China, on endothelial cells, these are the cells lining blood vessels, and finding that radio frequency radiations increases the permeability of blood vessels. This is important because of some evidence that the blood-brain barrier, that lining of blood cells that prevents substances in our blood supply from getting into our brain, that that is adversely impacted by radio frequency radiation.

14 h 33

There are a number of studies of neutrophils, those are being white blood cells that are not lymphocytes. And then a number of studies of sperm. And these are consistently positive. There are four studies of the effect of radiation with radio frequency waves on sperm and they invariably find that the mobility... the motility of sperm is reduced after exposure, to most of

these are nine hundred (900) megahertz, one point eight (1.8) gigahertz both motility and viability reduced and again, that is a laboratory investigation consistent with the reports of reduced fertility in men that hold their laptop on their lap and wireless mode for long periods of time, and of other sources of radio frequency exposure.

Q. [199] And, yes, the table continues on the next page also with Zhadobov et al.

Me MARIE-JOSÉE HOGUE:

What page?

Me DOMINIQUE NEUMAN:

Sorry, the page, the number at the bottom of the page is 103.

A. 103. Yes. Now phospholipid membrane, this is Zhadobov, so this is not a sailor system and it does affect, it shows effects on membranes at sixty (60) gigahertz. It's a fairly high intensity radio frequency field. The, all of the studies, the first three studies on this page are all on artificial membranes and do show changes in the membrane. The Del Vecchio study is effect on certain kind of neurons, those that use acetyl-choline as the transmitter, grown in tissue culture and it shows

that the neurites, the extensions from the nerve cells, are decreased after exposure to nine hundred (900) megahertz.

Q. [200] I see that each time, on each of these tables, or in most of these tables, there is an indication of the exposure conditions and on three of the studies here, on this page, they were at around nine hundred (900) megahertz.

A. That's correct and that's important because that is the frequency with which smart meters will be utilizing and generating RF.

Q. [201] The next page, Table 3.7, Direct effect on proteins.

A. Once again, there are a mixture of yesses and nos. On protein and epithelial cells, yes. Proteins and epithelium, yes. Effects on haemoglobin, yes. Effects on myoglobin, that's the muscle protein, yes. Then another study on myoglobin in solution and no, they didn't find anything there. Effects on chromatin, that's part of DNA, yes. Effect on ferritin protein, a protein that binds iron, yes. In another study from the same group on ferritin protein, yes. Effects on human-hamster hybrid cells, yes, disruption of cell division. Effects on the pineal gland, which makes melatonin which has

been implicated in a lot of VMF effects, yes. Effects on black locust seedlings, these are baby trees, yes. Effects on enzyme activity of a ascorbate oxidase, yes. Effects on the enzyme activity acetyl-cholinesterase, yes. Effects on protein, yes. On globular protein, yes. On green fluorescent protein, yes.

Now, you know, these effects seen in a protein solution neuron and artificial membrane, it's difficult to extrapolate those to say that this is indicative of hazard to humans. And I'm not doing that nor are these investigators doing that. But what is very important here is most of our standards, national, international standards, are based on this assumption that there is no effect of radiofrequency radiation except at intensities that cause measurable heating. And in almost all of these experiments, these intensities do not cause measurable heating, and yet clearly are having effects in biological systems. Now I want to say a little bit more about this heating because that's a fairly important consideration. And I emphasize the word "measurable". Now, how a microwave cooks your potato is obviously by generating heat.

Me MARIE-JOSÉE HOGUE:

Là, je vais faire une objection parce que clairement, là, on s'en va dans de l'opinion, là. On n'est plus dans la revue de la littérature. Ce qu'il veut faire c'est nous amener dans le champ d'expertise qui ne lui a pas été reconnu.

Me DOMINIQUE NEUMAN:

Le Dr Carpenter est en train d'expliquer le contexte de différentes études, et de toute façon, la Régie n'a pas déclaré que le Dr Carpenter avait moins de droit que n'importe quel autre témoin qui ne serait pas reconnu expert. Et au contraire, Monsieur le Régisseur, vous avez cité les attentes de la Régie où vous avez même indiqué que la Régie régulièrement entend des personnes qui ne sont pas experts et qui ont chacun leur champ d'expertise, donc la Régie n'a pas déclaré que de tous les humains sur la terre, monsieur Carpenter est le seul qui n'a aucune expertise et qui ne peut pas parler de ce qu'il connaît et de ce qui, de... il a un diplôme en médecine, il est capable de parler de ces choses-là.

14 h 40

Me MARIE-JOSÉE HOGUE :

Ce qu'on lui a demandé de faire c'est de nous faire un bilan de ce que les... il a fait un bilan sur

les recherches faites par d'autres. Alors, il doit s'en tenir à cela, pas de nous sortir ici une théorie, qui est la sienne, là, et qui dépasserait son expertise, c'est tout. Un bilan des recherches qui ont été faites par d'autres sur cette question-là.

Me DOMINIQUE NEUMAN :

Bien, il est en train d'expliquer c'est quoi la notion d'effets thermiques puisque ces mots apparaissent dans différents textes qui se trouvent dans les différents documents. On parle d'effets thermiques, non thermiques, il ne fait qu'expliquer de quoi il s'agit.

LE PRÉSIDENT :

Bien, s'il veut nous référer à des études qui ont parlé des effets thermiques ou qui démontrent qu'il n'y a pas que les effets thermiques qui résultent de l'exposition... bien, c'est ce qu'il a fait d'ailleurs.

Me DOMINIQUE NEUMAN :

C'est ce qu'il était en train de dire quand ma consoeur l'a interrompu.

LE PRÉSIDENT :

Il nous réfère à des études qui montrent qu'il y aurait des effets non thermiques d'exposition aux

radiofréquences. Ça, c'est correct, là, tu sais.

Me DOMINIQUE NEUMAN :

C'est ce qu'il était en train de faire, c'est exactement ce qu'il était en train de faire.

LE PRÉSIDENT :

En tout cas, on va écouter, mais il faut qu'il s'en tienne à ce bilan-là, des études faites par d'autres.

Me DOMINIQUE NEUMAN :

Et d'expliquer ce que ça veut dire, de la même manière... dans plusieurs cas, il a... on parlait d'un certain type de cellule, il a expliqué ce que voulait dire le mot technique qui décrivait la cellule, de quelle cellule on parlait, il a fait ça à plusieurs reprises. Et c'est normal pour qu'on comprenne de quoi il est question.

LE PRÉSIDENT :

Bon, en tout cas, posez-lui une question, là, on va voir.

Me DOMINIQUE NEUMAN :

Bien.

Q. [202] Dr. Carpenter, could you continue elaborating on this aspect that was shown by these studies about heat, non-heat effect or...?

A. I think the only thing I need to say is that the

intensity of radio frequency radiation in these studies was not adequate to cause measurable tissue heating.

Q. [203] Okay. And nevertheless, there were some... in some cases, there were positive...

A. And yet, in many cases, there were positive biological effects.

14 h 43

Q. [204] We'll continue at...

A. I could perhaps read the last paragraph of the summary of this article, because I think this does show where this committee came from. And it says,

> In general, there are no coherent pattern of exposure, conditions, or in vitro cells system that consistently show effects of exposure to radio frequency fields below international guideline levels.

And let me emphasize that international guideline levels are those that cause measurable heating.

> The reported studies are still mostly diverse in terms of exposure and biological system tested. Furthermore, the reported effects lack independent verification. Even in cases where

there are several studies using similar cell lines as in the case of lymphocytes, the results were the effect of RF field exposures are conflicting.

Q. [205] The group that was the author of that report, for which we've read several pages, its name was AGNIR, that's correct? AGNIR, that's the Advisory Group on Non-Ionising Radiation.

A. That is correct, yes.

Q. [206] And that report was remitted to the... That's a United Kingdom group, that's correct?

A. That is correct, yes.

Q. [207] And it was remitted, it was commissioned by the Health Protection Agency of the United Kingdom?

A. Right.

Q. [208] I'll ask you to look at the next document, which is filed SE-AQLPA-7, document 23, it's 0094, it's a short document.

A. Again, I'd like to read only one paragraph from this document. So, this is the agency...

Q. [209] Just a second, so that everyone has the time to get... Yes, okay. So, that was the document from the...

A. This is the agency that solicited the previous

report, that had these multiple studies. And there is an underlined paragraph in this short report, let me read,

> HPA's view is that the continuing possibility of: (a) biological effects, although not apparently harmful, occurring at exposure levels within the ICNIRP guidelines, and (b) the limited information regarding cancer effects in the long term, together support continuation of the UK's long-standing precautionary approach to mobile phones. While technology has developed substantially over the past ten (10) years since the IEGMP report, the principles behind the IEGMP recommendations should continue to be observed. Excessive use of mobile phones by children should be discouraged, while adults should make their own choices as to whether they wish to reduce their exposures, but be enabled to do this from an informed position.

I think that is a clear endorsement of precaution.

Q. [210] So now, Dr. Carpenter, I invite you to back to your own report. You had finished, I think, section 39? That's where the Interphone report was discussed.

A. Yes.

Q. [211] So, if you can continue on the...

A. There is one other original report that I would like to discuss, which is the report of Hardell and Carlberg, in two thousand and nine (2009). Now, this is not a meta-analysis, but I think this has important implications for everything we've been saying.

Q. [212] Just for the record, is that one of the... I'll just check. I have Exhibit SE-AQLPA-7, document 17, 0088, which was a list of documents by Hardell, and... Which was a series of documents by Hardell. I see here the second document is two thousand nine (2009), "mobile phones, cordless phones and the risk for brain tumours".

A. And I will draw your attention to table 2.

Q. [213] Table 2 of the second document, which is part of this exhibit, yes?

A. I'm sorry, that's a long table. The table I'm actually interested in... No, that's a long one too. The table I'm interested in is table 1.

Q. [214] Table 1 of the two oh nine (2009), of the thousand and nine (2009)...

A. Of the two oh nine (2009), yes.

Q. [215] ... article. So, that's on the second one, yes.

A. There has not been...

Q. [216] So, that's the one on page number 7, right?

A. Yes.

Q. [217] Okay.

14 h 48

A. There has not been a lot of study of the effects of age on risk of brain cancer. This is, to my knowledge, the only study that has reported on the effects of age on brain cancer, but it's particularly important because... and the information is really in all of these tables. What Hardell has shown in this study, is that if you are under the age of twenty (20) at the time -- and I'm sorry because I was mistaken, it's really table 4 that shows the final odds ratios -- if you're under the age of twenty (20) at the time you begin to use a cell phone, your risk of developing brain cancer is almost five fold greater than if you are older. And this poses real issues because the use of cell phones, the prolonged extensive use of cell phones

is so common in teenagers, and even young children these days, they are at greater risk. And in this study, odds ratios are as high as four point seven (4.7) and for less than... for people less than twenty (20) years of age in... let me find the right table. But odds ratios are greater than five.

Q. [218] Excuse me, could you indicate it on which table, on which line, we can see this number that you're mentioning?

A. Let me be sure I have the right table.

Me DOMINIQUE NEUMAN:

If I may suggest, Mr. Commissioner, maybe it's a good time to take a short break so that Mr. Carpenter finds the appropriate figure and the article.

LE PRÉSIDENT :

On va prendre une pause de quinze (15) minutes. On reviendra à trois heures cinq (15 h 05).

Me DOMINIQUE NEUMAN :

Merci.

SUSPENSION

LE PRÉSIDENT :

Alors, Maître Neuman, est-ce que vous êtes en mesure de terminer votre interrogatoire en chef avant quatre heures (16 h 00), parce qu'on va

ajourner à quatre heures (16 h 00).

Me DOMINIQUE NEUMAN :

C'est à peu près ce que j'avais prévu, qui correspondrait à peu près à ce que j'avais annoncé. Donc, le temps sur le sujet lui-même, c'est deux (2) heures à peu près. Donc, on arrivera à quatre heures (16 h 00) à peu près.

LE PRÉSIDENT :

Il faut penser à la santé de notre sténographe et puis... tu sais.

Me DOMINIQUE NEUMAN :

Absolument.

LE PRÉSIDENT :

Tu sais? D'accord?

Me DOMINIQUE NEUMAN :

Mais c'est approximativement ça que j'avais estimé.

LE PRÉSIDENT :

Oui.

Me DOMINIQUE NEUMAN:

Q. [219] So, Dr. Carpenter, just before we go back to the document we were looking at for the Régie's reference, in the first maybe thirty (30) minutes of his testimony, Dr. Carpenter mentioned several studies and all of them have been filed. Like we didn't indicate the exact number of the filing in

each case, but they've been filed more or less in a sequential numbers. And there's a list of exhibits which is C-SÉ-AQLPA-0100 in which you can find each author.

So, we're at Hardell 2009, Dr. Carpenter?

A. I apologize for my difficulty in finding the right table. It's table number 1. I was looking on later in the report. What this table shows is odds...

Q. [220] Yes, it's the table on page 7, right? Page number 7?

A. Page number 7, yes.

Q. [221] In the electronic filing, it's page 13.

LE PRÉSIDENT :

Maître, est-ce que c'est bien le document 0088 Hardell and Carlberg?

Me DOMINIQUE NEUMAN :

Oui, oui. Yes.

LE PRÉSIDENT :

Mais c'est parce que, moi, je n'ai pas de pagination. C'est la version papier, mais c'est la table 1?

Me DOMINIQUE NEUMAN :

Table 1 of the second document which is... this exhibit contains two (2) articles, well, several articles from Mr. Hardell, and it's the second one,

the one which is in the International Journal of Oncology, 35, in year two thousand nine (2009). And we're looking at page 7 of that second article, which is table 1.

LE PRÉSIDENT :

Okay.

Me DOMINIQUE NEUMAN:

Q. [222] Yes?

A. I would call your attention primarily to the middle column which is looking at ipsilateral cancers from cell phone use or cordless phone use. And the critical numbers are sort of the second one in each column. So, for example, people that use mobile phones for more than one year, up to ten (10) years, had double the incidents, odds ratio of two point zero (2.0), and it's statistically significant because the ninety-five percent (95%) confidence limits are given below one point five (1.5) to two point five (2.5), so they're all greater than one.

Q. [223] Just so that we can understand the table, the second figure, which is a two point zero (2.0), that figure is what?

A. That means a doubling of the chance that those individuals would have brain cancer.

15 h 10

Q. [224] And the line on the...

A. This is specifically glioma.

Q. [225] And the line underneath is the ninety-five percent (95%)...

A. The boundaries.

Q. [226] The boundary.

A. The lower and the upper boundary. Now, for individuals that have use cell phones for more than ten (10) years, the next number is three point three (3.3) fold, and again, statistically significant because the numbers below do not go below one point oh (1.0). Cordless phones, this is not getting very much attention. It's only Hardell that really has studied this, but he shows similar relationships, and for greater than ten (10) years, he actually has an odds ration of five point oh (5.0) for use of a cordless phone. Cordless phones do not regulate the radiofrequency radiation in relation to distance. It doesn't matter how far away you are from the base, and that is important.

What I really wanted to show this table for, however, is the next section, which looks at the risk of brain tumors if you use cell phones when you're less than twenty (20) years of age. And

in this case, a seven point eight (7.8) fold greater risk. Highly statistically significant. That's for cell phones. For cordless phones it's a seven point nine (7.9) fold, significantly elevated risk. If you look just below, if you're between the ages of twenty (20) and forty-nine (49), the risk falls down to two point one (2.1) fold and one point six (1.6) fold. And then, if you're over fifty (50), the risk falls even, well it's about the same, one point eight (1.8) and one point nine (1.9).

So, from a public health point of view, this is about the only well done study that's looked at teenagers and children usage. So, of course it does need to be replicated. But it suggests that the younger you are when you start to use a cell phone, the greater your risk of brain cancer. Another very, very important reason for precaution. And I am making the assumption, which I think is quite valid, that if cell phones cause brain cancer when you have a localized exposure to your head, the radiation frequencies that you have from smart meters, from Wi-Fi, from all of these other wireless devices and radiofrequency devices in our environment are going to add to that

exposure. And while the intensity for any unit of time is less than that of holding a cell phone to your ear, the health impact may actually be greater if the aggregate overall exposure exceeds that that you get from use of the cell phone. So, in that regard, this is an important publication, even though it has not been replicated in other studies.

Q. [227] I'll ask you to go back to your amended report. So, we're at paragraph 40.

A. Yes. Paragraph 40 talks about additional studies that demonstrate that there are biological effects of radio frequency radiation at intensities considerably below national and international guidelines, which are set to avoid tissue heating.

The first article by Volkow et al. is a particularly important demonstration. Dr. Volkow is the woman who's the director of the National Institute of Drug Abuse and Alcoholism based in Baltimore, Maryland. She has not been an investigator particularly focused on study of radio frequency fields. The study she did was to use a brain imaging technique in normal human volunteers to look at the effect of turning on a cell phone. The subject had cell phones by both ears, but turned off and then one turned on, but in a silent

mode, so that there was no awareness of the subject whether the phone was on or not on. And then, monitoring the uptake of glucose, glucose is the sugar which is the only food source for nerve cells, and what she demonstrated was when the cell phone was turned on, even though the subject was not aware of it, she could see an increase in the use of glucose in that part of the brain, in the temporal cortex just underneath the ear.

This provides really very strong proof that radio frequency radiation has effects on nervous tissue. It isn't particularly proof that that effect is related to cancer, but it certainly demonstrates convincingly that exposure to radio frequency radiation at intensities way below national and international guidelines have biological effects on the brain.

Q. [228] For reference, I'm not sure if we will need to consult it, but all the articles that are mentioned in Dr. Carpenter's paragraph 40 have been reproduced as Exhibit SE-AQLPA-7, document 26, it's 0097, en liasse, except for two articles that were previously filed before Dr. Carpenter arrived, and they are mentioned in his report with the proper quotes.

15 h 16

A. I'm not going to go through all of these publications in great detail, but I will talk about 40 b, the McCarty paper. This is a two thousand and eleven (2011) paper which, to my mind, is the first really good study that has demonstrated what has become known as the syndrome of electro-hypersensitivity. And I should say that until this paper came out, I avoided in my publications any significant discussion of electro-hypersensitivity because I was unconvinced that it had been rigorously demonstrated in a controlled setting to be real.

Q. [229] Yes, excuse me, Dr. Carpenter. That was an exhibit previously filed as SÉ-AQLPA-5, document 5, 0037. I'm not sure if that's the document that the Régie has? We had filed it I think at... I think it was filed as part of my counter-questioning of... cross-examination of Mr. Plante, Dr. Plante.

C-0037.

LE PRÉSIDENT :

C'est beau, allez-y.

Me DOMINIQUE NEUMAN:

Q. [230] Yes, okay, please continue? So, could you repeat what you...

A. Let me describe what electro-hypersensitivity is. And actually, the World Health Organization has held a full conference on this. It is a series of rather non-specific symptoms that some people report feeling when they're in the presence of radio frequency fields. It's primarily headaches, fatigue, mental dullness, sometimes joint pains, sometimes skipped heartbeats. I personally had been rather skeptical that it was a real disease. It's very much like chronic fatigue syndrome, fibromyalgia. The symptoms haven't been very specific. And until this paper, there has never been a study where individuals that report to be electro-sensitive were brought into a controlled circumstance and asked to tell whether or not they felt ill in relation to radio frequency fields, either on or not on.

This was a study done in a neurology department with contemporary brain imaging techniques. The subject was a female physician who developed headaches when she was in... she reported she developed headaches in the presence of radio frequency fields. They had controlled administration and asked her whether she... she had to report whether she had a headache or not a

headache, depending on... she didn't know whether the fields were on or off. But the investigators demonstrated highly statistically significant results that she developed headaches and some other symptoms much more frequently when the fields were on than when they were not on.

Electro-hypersensitivity, in some countries, like Sweden, is being reported in a fairly significant percentage of the population, maybe as many as ten percent (10%), or even greater. And there's getting to be a lot of public concern about this. Now, I'm not saying that every person that reports that they have headaches and their mental function is not as good as it might be is suffering from electro-hypersensitivity. But I think we're going to see a lot more of this.

One of the big concerns again, if this is correct that memory function is reduced, then, children in schools are particularly vulnerable population and it's yet another reason to practice precaution, particularly in terms of placing smart meters in schools, placing Wi-Fi in schools, wired computer labs give access to the internet, which is obviously important in education, but we don't need to go wireless everywhere.

Q. [231] In that study, the McCarty study, was there some conclusion also in the conclusion of the text about the effect, the change of field may have had on the subject?

A. The change of...

Q. [232] The change of field, the fact that the field was switched on and off, it's...

A. That's right, yes, and that is an important factor, although it's hard to put in context with all we know. The electro-hypersensitivity, the headaches, which were her primary symptoms, did not occur when there was just a constant radio frequency wave. It depended on on and off. And there's some other evidence from everything, from cellular systems to human studies, that indicates that the transients, the on-and-off switches, the transients are more -- I don't want to say dangerous -- more... have greater biological effects than just the pure sign wave of the radio frequency field.

Q. [233] The next article is... do you want to talk about pathology?

A. Now, I don't think I want to go into all of these articles in great depth, but the next article looks at brain evoked potentials and demonstrates they're altered by Wi-Fi signals. The one after that looks

at sleep...

Q. [234] Could you describe the name so that we know on the transcripts which one you're talking about?

A. Yes. Papageorgiou is the one that looked at the brain evoked potentials. Altpeter, under d., and Roosli, these looked at sleep quality in relation to a... I believe this is a cell phone tower that was shut down for a period of time and local residents had better sleep quality after that. Abelin et al. is a sleep...

Q. [235] Just to go back on Altpeter, what was the power density of the Altpeter experiment?

A. Now, let me go to the study.

Me MARIE-JOSÉE HOGUE :

C'est quel document?

Me DOMINIQUE NEUMAN :

C'est Altpeter, c'est...

Me MARIE-JOSÉE HOGUE :

Quel document?

Me DOMINIQUE NEUMAN :

Je réponds à ma consoeur. This document is part of SÉ-AQLPA-7, document 26, it's 0097, which is all the documents from this section number 40.

A. It was short-wave EMF six (6) to twenty-two (22) megahertz... the abstract doesn't say power

density, let me find it in the methods. A maximum power of two (2) times hundred and fifty (150) kilowatts. And the transmitter was shut down for maintenance and the investigators studied the sleep patterns of nearby residents before, during and after the shutdown and found a significant improvement in sleep quality when the transmitter was not on.

Abelin et al., this is e. under number 40, this also looked at sleep disturbances in the vicinity of a short-wave broadcast transmitter in Schwarzenburg. I'm not sure I remember what country that is, it's obviously Germanic. And they found strong evidence for a causal relationship between the operation of the short-wave radio transmitter and sleep disturbances in the surrounding population.

Hutter et al., two thousand and six (2006), again a study looking at sleep problems near, in this case, a cell phone tower, reporting significant disturbance of sleep.

Preece et al., two thousand and seven (2007), in a village that had a cell phone... had several cell phone antenna systems, they found that individuals in that village had differences in

migraines, headaches and dizziness as compared to residents of a controlled village that did not have such exposure.

Robertson et al., looked at pulsed electromagnetic exposures and demonstrated that brain processing was adversely impacted in individuals close to the exposure.

Buchner et al., i., was a long-term study of modulated radio frequency fields and showed clear evidence of increases in certain hormones and neurotransmitters, increase noradrenaline and a decrease in dopamine in individuals near to this station.

So, it goes on. And some of these reported effects, even if they're statistically significant, are not necessarily adverse, but again, it shows that even relatively low-intensity exposures coming from cell towers, coming from short-wave transmitters, have biological effects, and at least in some sensitive subset of the population, interferes with normal physiologic functions such as sleep and even neurotransmitters.

Q. [236] And are these effects at levels lower than what would cause the heating of cells?

A. All of these effects are much lower than what would

cause heating, because these facilities are transmitting within regulatory guidelines.

I should mention one other, Barth, k., this is a meta-analysis of these neurobehavioral effects from GSM mobile phones. And looking at nineteen (19) studies of cognitive function, they found that there was evidence of a decreased reaction time, reduced working memory and an increased number of errors in exposed persons.

And again, I do pay a lot of attention to these meta-analyses, I think they are perhaps much more important to consider than just individual studies. There are several other specific studies listed, but I don't think I need to talk about them in great detail.

Q. [237] Paragraph 41 is cellular and animal studies?

A. One argument that people make for minimizing health effects of radio frequency radiation is often that there are not good animal model systems that consistently replicate effects seen in human populations. However, forty-one (41) lists nine animal studies that show significant effects. The first one by Sinha is effect on thyroid hormone. Thyroid hormone does regulate metabolism and mental function.

15 h 28

The study by Nittby et al., is looking at cognitive function in rats exposed to radio frequency radiation. It's pulsed microwave frequency, and it shows that rats have impaired memory after two hours a week for fifty-five (55) weeks exposure. Kimmel et al., number c., looked at these, and there has been some concern that perhaps the decline in bee colonies is related to electromagnetic fields. I am not convinced that that's necessarily the case, but in this study they did find a significant difference between unexposed and exposed hives.

Panagopoulos, the same author we talked about earlier, in D, looked at reproductive capacity of... in cell death in an animal model system finding a relation to exposure. And so on. So, studies on sparrows, studies on bees, studies on birds. And now, well, in this listing I do not include negative studies. There are some negative studies as well. But clearly, these studies are showing significant change in behaviours or biological outputs in animal model systems.

Q. [238] Is it correct that the AGNIR report, which is the ninety (90) page document...

A. Yes.

Q. [239] ... in which we had a lot of... many tables, there a section also on animal studies in that report, which includes both the studies that shows positive effects and negative effects?

A. Yes. And that's a good place to look, because that's really quite encyclopedic, in a way in my report I did not attempt to do... to be.

Q. [240] Please continue.

A. Well, in my report, I discuss a threshold for harmful effects and I think one important point there is the question of whether humans and animals respond in the same ways to these exposures. And there's been evidence since the late eighties (80's) that that is not the case, that the geometry and the size of animals and people influence at the very least the induced currents generated in those people. So, I think there is some difficulty in comparing exposure thresholds in animals to exposure thresholds in people, and at least some evidence that humans are more sensitive than animals, because of our size and our two legs.

We go on, I go on to study questions about frequency bands. This is related to what we talked about a little earlier, that sometimes the pulsed

signals appear to be more harmful than pure sine waves. In number 44, I talk about the effects of microwave and radiofrequency radiation on cellular level responses. I list a long series of reports there. I think it's not productive use of our time to go through them all. There's a brief statement on each if these, reporting the results of that particular study. Again, these studies in cellular systems are important in documenting that there are biological effects at intensities of exposure that do not cause measurable tissue heating. But in almost every case, just demonstrating the biological effect in cells and tissue culture doesn't really help with the analysis of effects in humans that result in diseases like cancer or reduced fertility.

Q. [241] All these articles were filed, so the reference number is SE-AQLPA-7, document 28, it's 0099. And this exhibit, we have almost all, I say almost all because there are three or four missing, almost all of the articles mentioned in section 44 of Dr. Carpenter's report.

A. And I shouldn't minimize the importance of these articles. I think they are important. But I think going into the technical details of the responses

here is less than productive. But there's... I've prepared sort of a one-sentence description of the results of each, primarily to document the conclusion that exposures at levels that did not cause measurable tissue heating have been well documented to have a variety of biological effects.

Q. [242] We'll go to paragraph 45.

A. Well, I pretty much just said this, that 45 is my reiteration that the above non-thermal biological effects do indeed constitute a risk for serious harm to human health. They should not be taken lonely, must be taken in context of the human studies that I've talked about earlier.

15 h 35

Q. [243] It's section 45 of your report. Section 45 does not have a... I mean it's...

Q. [244] No, no, it's just that...

A. Page 24 in my report.

Q. [245] Yes, I wanted to make sure that everyone had the proper page.

A. Yes. Now, I think the important conclusion here is that changes in the human population may be irreversible and they may be permanent. Now, I emphasize « may ». Obviously, if you develop brain cancer, you can have it removed and sometimes that

cures you of the brain cancer, but it leaves you with deformities. Cancer is a very serious disease, even if your leukemia or your brain cancer is treated, it leaves harm. And if not caught early enough, it has every potential for causing death.

This whole series of reports confirm my conclusion, at least add very strong support to my conclusion, that there are health effects of radio frequency radiation at intensities that do not cause measurable heating, that this is demonstrated in cellular systems, in animal systems, even in artificial membranes, but of greatest concern is the evidence from the human studies of individuals both living around radio frequency transmitter facilities, and particularly those even stronger studies on extensive and long-term use of cell phones resulting in cancer.

Q. [246] You frequently mentioned studies on cell phones. Are there any studies on exposure or long-term exposure to smart meters?

A. No. There have been no studies, to my knowledge, of disease outcomes in relation to smart-meter exposure. Smart meters are very recent. They're being applied, they're being put into homes all over North America and Europe just in the last few

years. Their exposure is... the concerns are not different than those for other sources of radio frequency radiation. And from my judgement, first of all, it would not be possible at this point to do a good study on smart-meter exposure because they haven't been around long enough for the diseases of concern to appear. Secondly, it would be almost impossible to separate the smart-meter exposure from the other sources of radio-frequencies exposure in the environment. The symmetry is very difficult. Certainly, from a smart meter, the exposure is going to be greatest if you're close to the meter, it's going to fall off fairly rapidly with distance. If, as in the way that smart meters are going to be installed, there is a reflective plate, it's not even going to be a simple fall off with distance, it's going to be complicated by reflection off of other surfaces.

But the point is that nobody has done that study and I am actually skeptical that such a study ever can be done with adequate exposure assessment. But that doesn't limit my concern about the implantation of smart meters without... I mean I'm not saying I oppose implementation of smart meters. In the ideal case, they would be wired smart

meters, they would cause no elevation and exposure to radio frequency radiation. I do understand the cost implications of having all of that be wired, but I do believe strongly that there are things that the utilities can do, things that regulators can do, that will allow us to use smart meters but in a fashion that minimizes the exposure to human populations, especially to children, but really to everybody.

Q. [247] What do you mean by that -- to minimize exposure?

A. Well, for example, what I'm concerned about particularly is that we're on a rapid road without critical evaluation of putting radio frequency devices everywhere. The immediate smart meters that are being placed in homes are to communicate between the home and the utility, information on frequency of use, amount of use of electricity. Some of those smart meters are on the outside of the home, some of them are on the inside of the homes. If they're on the inside of the homes, there's a much greater possibility that people, in their day-to-day business, will go up near to the meter. So, one simple thing to do is put the meters on the outside. That, of course, may be difficult

when you have apartment buildings where you want meters in every apartment.

The other thing that really concerns me is the plan for the future are the Zigbee meters that will be put in every appliance in our homes. And I know that already at least the General Electric company is installing these meters in the appliances that they measure. The plan for the future, not right now, is that your refrigerator, your dishwasher, your clothes dryer, your washing machine, your toaster, will all have little meters that will communicate to the smart meter, hopefully on the outside of your house, that will document the use of that appliance. Now, the kitchen is going to be full of these things communicating regularly. That suggests to me that in the future there can be very serious problems.

15 h 41

Now, the other thing that can be done in the short-term. The communication to the utility from the smart meter that's used is relatively infrequent. But the meters are generating these spiking signals somewhere between a thousand (1,000) and three thousand (3,000) times a day. Most of that information, apparently only six of

those spikes are actually used. Now, this is information I've gotten through the attorney, but why does that meter have to generate all of these other spikes if it's not being used? If there are only six spikes a day that documented the use of electricity in your house, that's a much reduced exposure than if it's almost three thousand (3,000) spikes a day. So, a simple thing, I don't know how simple it is technically, but I see no reason why you should have all of these spikes that are not being used. I still am concerned about the Zigbee in the future. I think that's going to dramatically increase exposure.

Q. [248] To go back on the cell phone studies, you mentioned that there are those studies on smart meters because they are recent. Why is the information on the... Why are these cell phone studies useful for us to learn something about smart meter exposure? Why is it pertinent?

A. Well, these studies, not just from cell phones, but also from the radio frequency generating towers. These are useful because these identify the human diseases that are associated with exposure to radio frequency radiation. Now, the frequencies are not identical in all cases, but the nine hundred (900)

megahertz for the smart meters is very similar to that that's used for cell phones. There are a range of frequencies and the studies from AM radio transmission on up through the higher frequencies, we've not really seen very much in the way of differences in disease outcomes as a function of frequency in the radio frequency range. So, and all of those frequencies are not pure sine waves. They have transients. And when they're pulsed, they appear to be even more dangerous. And most microwave frequencies are modulated at... they have a radio frequency wave on top of a slower modulating wave.

So, the reason that those studies are relevant is they are studies that have demonstrated disease in human population with relatively well defined exposures, where we can compare more highly exposed people to less highly exposed people and look to see what diseases they get. I've said that smart meter are not uniquely bad, but what I'm concerned about is that they add to the radio frequency exposure. And if there's anything we've learned from studies of chemicals and disease, is that what causes disease is the total exposure over periods of time. It's not just the intensity at one

point in time. One arsenic pill today versus a little arsenic in your food over multiple days is going to lead to the same disease, because these chemicals cause disease that's based on what the body is exposed to. And the same principle applies with radiofrequency radiation. Smart meters, unless they are designed to minimize human exposure, are going to add to aggregate radio frequency exposure and contribute to the development of the same diseases. I emphasize leukemia and brain cancer because the evidence is strongest there, but there's also strong evidence for male infertility. There's increasingly developing evidence for neurodegenerative diseases. I've talked about the electrical hypersensitivity, which appears to be a much more common syndrome than appreciated. So, everyone is going to be impacted by increased exposure.

Q. [249] Dr. Carpenter, let's go to paragraph 46 of your amended report, which is the section on the division within the scientific community.

A. Yes. I've certainly said that the scientific community is not uniform in accepting the views that I've expressed that radio frequency exposure is something of significant concern. And there are

a variety of reasons for this. One reason I've alluded to is that many of the standard setting organizations are dominated by electrical engineers and not individuals with health backgrounds or understanding of biology.

There is also the great tendency, when we have something that we all enjoy, to not want to see it as being harmful. And I think there's a great lack of information in the public of the dangers of these exposures. There's also an important issue of conflicts of interest in terms of who does the study, who pays for the study, is there a reason independent of the science that would cause one to conclude there was not or there was adverse health effects? Now in this section...

15 h 48

Q. [250] Yes.

A. ... we discuss in fair detail the various organisations that have minimized the material presented in the BioInitiative Report but more generally in the other documents that reflect the research that went in the BioInitiative Report that was later published in peer-reviewed journals. And I am often asked why we did that BioInitiative Report when we were sort of an ad hoc group of

individuals that weren t part of any specific organisation, and the answer to that question is that, we were individuals that felt that the reports coming from these organisations were biased and inaccurate and that they were excessively conservative and they were not adequately protecting the public health.

So it is a legitimate criticism that the authors of the BioInitiative Report were selected because they had a point of view that we felt was not being reflected in other national and international documents. But, at the same time, we document the scientific support for the position that we ve taken. And from my perspective, the support for our position has just grown enormously, much stronger in the last four year, which is the reason we ll be updating the BioInitiative Report next year.

Q. [251] You filed a document by a mister... by a group of researchers, the first researcher s name is Mr. Huss, Mr. or Mrs. Huss, I m not sure. H-U-S-S. It s SÉ-AQLPA-007 Document 24, it s 0095. It s Anke Huss and Matthias Egger and a few other people who are the authors of this article. It s mentioned in paragraph 53 of your report.

A. Have we found it?

Q. [252] Yes. What...

LE PRÉSIDENT :

Allez-y.

Me DOMINIQUE NEUMAN:

Q. [253] Yes, okay, so what is significant about this article by Huss and others.

A. This is an important article. It was published in Environmental Health Perspectives which is the official journal of the National Institute of Environmental Health Sciences, it s probably the premier journal in environment health and I serve on the editorial board of that journal. This is a study written by people from Basel, Bern and Basel, Switzerland, and what they did was look at the source of funding for studies on radiofrequency fields and the results that were obtained. And let me just read on the data synthesis,

> Of fifty-nine (59) studies: twelve (12) were funded exclusively by the telecommunications industry, eleven (11) were funded by public agencies or charities, fourteen (14) were mixed funding, (including industry), and twenty-two (22) the source of funding

was not reported.

Studies funded exclusively by industry reported the largest number of outcomes but were least likely to report a statistically significant result. The odds ratio was zero point one (0.1) to one (1), ninety-five percent (95 %) confidence interfolds zero point zero two (0.02) to zero point seven eight (0.78) compared to studies funded by public agencies or charities. This finding was not materially altered in analysis suggested for the numbers of outcomes reported, study quality or other factors. And the conclusion is that the interpretation of results from studies of health effects of radio frequency radiation should take sponsorship into account.

And I think the important conclusion here is that the telecommunications industry certainly has a reason to not want their product demonstrated to be hazardous and therefore one, and I don t mean that every investigator was totally perverted by this, but you can always get a negative study by setting the exposure limits properly, by having a reduced number of participants, and that sort of thing. But this is one reason why it is so important to look at members of national and

international committees, look at source of funding for articles, consider conflicts of interest along with every other factor in evaluating scientific reports.

Q. [254] Okay. In paragraph 54 of your report, section 6.2, you talk about the evolution towards precaution and prudence. Could you elaborate on that? On paragraph 54 and following.

A. Right. This section deals considerably with the BioInitiative Report and the strong support of precaution as a standard policy for exposure both to ELF and RF. We comment on the existing standards, as I have said, several times, existing standards almost everywhere are set to prevent tissue heating.

15 h 55

When you talk on your cell phone, you don't want to cook your brain. But I hope that I've demonstrated through these multiple scientific studies, both of humans and animals and cellular systems, that there are many biological effects, including many hazards demonstrated in humans, at intensities of exposure that do not cause... that are within the existing guidelines, which are set not only to prevent tissue heating, but to have a

safety factor in addition.

So, what we have done in the Bioinitiative Report and have discussed in our other publications is a consideration of those that have supported standards that are like those contemporary ones, why we don't agree with them, and tried to identify levels of exposure to radio frequency radiation, below which there isn't very much evidence of harm. When we do that, we come with numbers that are very, very low and it's very important to emphasize we did not, at any time, propose those as standards because they would be unrealistic as standards.

Q. [255] First, in paragraph 55 of your report, you discuss about the earlier reaction to the Bioinitiative Report which was issued about five years ago.

A. Well, if anyone wants to see a report that really takes us on, look at the COMAR Report, this was published by the Committee on Man and Radiation in two thousand and nine (2009), and it's almost complementary in the sense that this whole article is a matter of trying to discredit the Bioinitiative Report, saying that we're self-appointed, which was true, saying that we're people that have a history, that most of the authors,

almost all of whom are distinguished academic scientists -- one exception perhaps is Cindy Sage -- but that we have a history of arguing that existing standards are not protective of human health, which is absolutely correct, but, you know... perhaps I can just read from the summary,

> Since appearing on the internet in August 2007, the BIR...

Which is Bioinitiative Report,

> ... has received much media attention, but more recently, has been criticized by several health organizations. See section entitled. Views on health agencies about BIR." COMAR concludes that the weight of scientific evidence in the radio frequency...

Q. [256] Dr. Carpenter, just a second, so that we know which document we're talking... you are reading presently the COMAR article?

A. This is an abstract of the COMAR article, about two thirds (2/3) of the way down.

Q. [257] Yes. So, that's Exhibit SÉ-AQLPA-7, document 21, it's 0092.

A. And then, the final statement I want to read there is,

> COMAR concludes that the weight of scientific evidence in the radio frequency bioeffects literature does not support the safety limits recommended by the BioInitiative group.

And again, we didn't recommend those as limits, we identified numbers that we felt there was no significant evidence that there were adverse health effects below that level. We specifically did not recommend those as regulatory limits. So, I think that's a somewhat distortion of our position.

Some of the other comments in this report are probably fair. We are self-appointed, we are, for the most part, among the best active researchers in this field, and I would exclude myself from that, in the sense, it's not my own research, but we feel that these committees, including the COMAR Committee, are not critically evaluating the scientific literature, because if they did, they would come up with a different view.

Q. [258] Dr. Carpenter, I would like to go directly to page 39 where the first graph of... the first graph of your report is on page 39 of your report.

LE PRÉSIDENT :

Maître Neuman, il est presque quatre heures (16 h 00), vous êtes rendu au paragraphe 55 je pense, puis il y en a 70, c'est sûr que vous ne finirez pas à quatre heures (16 h 00).

Me DOMINIQUE NEUMAN :

O.K.

LE PRÉSIDENT :

Alors, à moins que vous en ayez pour cinq minutes, on va ajourner à demain matin.

Me DOMINIQUE NEUMAN :

Oui, O.K. Ou est-ce qu'on fait les graphiques maintenant ou on les fait demain?

LE PRÉSIDENT :

Bien là, de toute façon, vous êtes rendu... je ne me trompe pas, là, vous êtes rendu au paragraphe 55, il y en a 70. Donc, vous avez besoin du temps pour compléter. Mais on a dit qu'on ne va pas épuiser notre sténographe, on va ajourner à quatre heures (16 h 00). Alors, on continuera demain matin à neuf heures trente (9 h 30).

Me DOMINIQUE NEUMAN :

Je vous remercie.

AJOURNEMENT

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SERMENT D'OFFICE :

Je soussigné, CLAUDE MORIN, sténographe officiel, certifie sous mon serment d'office, que les pages qui précèdent sont et contiennent la transcription exacte et fidèle de la preuve en cette cause, prise par moi au moyen du sténomasque, le tout selon la Loi. Et j'ai signé.

_____

Claude Morin

sténographe officiel