File No. 65381

C A N A D A

IN THE PROVINCIAL COURT OF BRITISH COLUMBIA

(BEFORE THE HONOURABLE JUDGE F. HOWARD)

SURREY, B.C.

1997 JANUARY 29

REGINA

V

VICTOR EUGENE CAINE

PROCEEDINGS AT

CHARTER APPLICATION

APPEARANCES:

T. DOHM, A. CHAN, M. HEWITT for the Crown

J. CONROY, P. SMITH GANDER for the Defence

V. KARIYA Court Recorder

S. OSBORNE Transcriber

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PART III - EXHIBITS

NO. DESCRIPTION

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Nil

1997 JANUARY 29

(PROCEEDINGS RECONVENED PURSUANT TO ADJOURNMENT)

MR. DOHM: Your Honour, recalling the matter of Regina versus Caine. I'd like you to know Dr. Kalant is present. He's in the courtroom and unless somebody has some found objection, I would propose he stay here at least until the conclusion of the examination in chief of Dr. Morgan.

MR. CONROY: That's fine with—

THE COURT: Any objection to that?

MR. CONROY: -- me, Your Honour.

DR. JOHN PAUL MORGAN, recalled, testifies as follows:

THE COURT: All right. Dr. Morgan, you are still under oath. You understand that.

A Yes, ma'am.

EXAMINATION IN CHIEF BY MR. CONROY continuing:

Q Dr. Morgan, at the end of the day yesterday, we got to topic 18, punishment for marihuana and my friend—

THE COURT: I'm going to my version of the—

MR. CONROY: Oh, right.

THE COURT: -- manuscript. Madam Clerk, there's an exhibit, I think it's right in front of you.

THE CLERK: Yes.

MR. CONROY:

Q You'll recall my friend objected in terms of it not being within your area of expertise, and I believe you explained how you gathered the information and the purpose of gathering it.

A I might have commented also that my co-author, Professor Zimmer, is indeed a sociologist and criminologist and she and I worked together on this particular chapter, as we did on everything else.

Q And I'm not asking you for any opinion on it or anything, but simply it's information that you gathered

in order to inform you and Professor Zimmer and then any of the readers of the manuscript of that type of data, so they can put it in relation to the medical and health data?

A Correct.

Q Okay. Let's go on then to—

MR. DOHM: At this stage, Your Honour, I think we're awaiting your ruling on the propriety of the question and whether or not the answer should be forthcoming.

MR. CONROY: I'm not putting any—

THE COURT: I think the—

MR. CONROY: No, I'm accepting—

THE COURT: -- question has been abandoned.

MR. CONROY: I'm accepting the objection.

THE COURT: He's asked the witness why this chapter is there.

MR. DOHM: All right.

THE COURT: I think that's the full extent of—

MR. CONROY: Yes. My position is is that it's—

THE COURT: -- our inquiry into it.

MR. CONROY: My position is it's not something that the doctor can express an opinion about or anything. He's just told us it's there, it's part of the manuscript and it's therefore just further information for you, much like any of the Brandeis information and no more than that.

MR. DOHM: Thank you.

MR. CONROY:

Q Let's then—the next chapter is the one that we don't have. According to the table of contents, it would be entitled Marihuana Use Can be Prevented, and another way of putting it is demand reduction, as I understand it?

A Correct.

Q And this is an area, we don't have a chapter, but you can tell us essentially what that's about and I assume this is again from a public health perspective in terms of reduction of demand or how to prevent use or reduce use.

A Yes, I think so. That is, marihuana prevalence in the United States reached its all time high in 1979 and it began to decline. That is, in the two principal documents of which Americans are questioned about their drug use, prevalence data among high school seniors and among the general population showed a decline in marihuana use from 1979 to approximately 1991. Since 1991 in the last two to three versions of the survey, maybe 1993 would be better, that's when everything reached its nadir. The prevalence in the general population of the United States has remained approximately the same according to these two survey tools.

But the prevalence in teenagers aged twelve to seventeen in the United States approximating eighth graders, tenth graders and twelfth graders, that prevalence has increased. Because of the reports of increasing prevalence among high school students, the United States drug abuse apparatus, particularly in the forms of NIDA and the Department of Health and Human Services have begun to call for renewed prevention efforts. This is very interesting to us in light of the fact that these particular teenagers have received what I might perhaps impolitely call an onslaught of drug information since their school days begun. In fact, they've received more negative drug information than I think any cohort of young people in the history of the universe.

One-third of these students have received DARE education, DARE is the Drug Abuse Resistance Education in which uniformed policemen come to the school and are integrated into the school curriculum to make anti-drug statements. In almost every state in the United States mandates drug resistance or drug prevention education for young people, often times starting at grades Kindergarten, so that American teenagers, particularly this cohort of American teenagers, have received in school more drug education, essentially all of it negative and much of it directed at marihuana than any group of young people ever have.

In addition to this, as I described yesterday, American teenagers have been the recipients of the one million dollars per day in donated advertisement of the Partnership for a Drug-Free America in which private advertising agencies develop ads which have been placed by the non-profit Partnership for a Drug-Free America in all American media. I know of no media, perhaps High Times magazine and a few others, which resist these ads and they're in the New York Times and the Washington Post and Los Angeles Times and on every major television station, both network and local presentations and in fact one finds them in rented videotapes in the United States.

So the point of our chapter is that despite this effort and however one evaluates its character, the teenagers of the United States have heard drugs, drugs, drugs, drugs, drugs, drugs and by the way don't do them for most of their school life. When queried, young people exposed to such education say oh, I won't do drugs. That's the consistent finding. They say they will not. It turns out that they will. In fact, in a series of embarrassing evaluations of the DARE programme published in the American Journal of Public Health, it has been shown the DARE programme has no impact on drug use among young people, no impact whatsoever in terms of diminishing or diminishing resistance to experimentation with drugs, diminishing the tendency to experiment with drugs.

So we tried to document this and have concluded that more prevention, more resistance drug education is a waste of time and money, and we also point out that this is an unprecedented social experiment, to expose Kindergartners to through age six to significant drug information, something that's never been done before, and in fact something that's clear that they have very little interest in. Children in Kindergarten to age six have very little interest in drugs. They do not speak of them, it's not an important topic to them, they show relatively little interest but in the United States their interest has been heightened, piqued and I might even say pandered to by this onslaught of material coming from their government and their policemen and their schools and officially integrated into their curriculum, and I might offer the hypothesis that one of the reasons there's been an increase in drug use in the United States, although I do note there's been a similar increase in other countries in the world, I do wonder if this onslaught of prevention, anti-drug education, never take a drug ever, has not contributed to their curiosity and perhaps bears some responsibility for promoting this increase. I state that only as a hypothesis. I cannot prove it. So that's what that chapter is about.

Q And so looking at this from the perspective of a physician and having a concern about public health, you're commenting then on the current approach in the United States in particular and it doesn't seem to be effective—

A Right.

Q -- looked at other approaches as well, have you, and the other approach, one of the other approaches you've looked at I take it is what Chapter 20 is all about, the Holland's liberal marihuana policy?

A Yes. We are, Professor Zimmer and I, and many Americans involved in drug policy and drug care issues, that is caring for individuals who have difficulty with drugs, are fascinated, intrigued by the Dutch experience and as I told you in our earlier conversation, the Dutch experience grows out of a series of ideas emanating from the public health apparatus in the Netherlands; that is, the government received advice from public health officials both government-paid and otherwise,

and physicians involved in drug abuse issues in the Netherlands and in 1976 they made the decision that drug—Dutch policy should be radically changed, and that marihuana should be made relatively available to young people in Holland. I'll say a little bit more about how that happened, but the two main drives behind that were clearly stated by Dutch public health officials.

The first is that because cannabis has minimal biological harms, they were not worried about making it more available to young people. And the second issue was that they hoped to separate the criminal markets between cannabis and what they refer to as harder drugs, in this case mostly heroin and cocaine are under discussion. There actually was some ancillary goals of the policy; one was that they wished to remove drug dealing from outside to relatively civilized retail dealing inside, really a commentary on public order.

They also felt that it was very, very likely that Dutch young people would wish to use cannabis. They express quite clearly cannabis is apparently here to stay. It is unlikely that any prevention efforts will work so the issue is to supply young people with cannabis under a controlled retail scheme and to separate that very, very clearly from the sale of other drugs, and to do that the Dutch basically accomplished a de facto legalization, not a de jure one.

Cannabis remains illegal under the Dutch codes, but a decision was made simply to permit retail sales, exchanges and never to arrest anybody for possession of cannabis. This is accomplished through a network of coffee shops and if one's in Amsterdam or other places in the Netherlands, you look on the window of a store that says coffee shop and if coffee shop is spelled in English, written in English, you can be relatively certain that cannabis is available for sale there. The coffee shops usually do not sell alcohol, although a few of them now do.

They are rigorously investigated if there is any suspicion of sale of other drugs there. In fact, the stores are frequently closed if there is a suspicion or proof that cocaine or heroin are available in the stores in any arrangement whatsoever, but if you enter the store and there's available snacks and juices and a house dealer who will then bring you the menu of available cannabis preparations. There is a limit on how much one can purchase. One can consume it on premises, but many people buy it to carry away. In some of the larger coffee shops you may buy joints, rolled cigarettes, but mostly it's sold as loose marihuana or loose—or packaged hashish. There's also a few marihuana/cannabis foodstuffs available in such shops. These have been in existence since 1976, so Dutch—one may enter the shop at age sixteen. One may not purchase until age eighteen.

We have tried to document in detail what this appears to have meant and let me just state the two things that it has meant most clearly, which is the prevalence of marihuana use in Dutch teenagers is by and large lower than it is in the United States and by our calculation it's significantly lower in the twelve to seventeen or twelve to sixteen age group. So in the United States, where ten million people have been arrested for marihuana offences since approximately 1970, the prevalence of marihuana use is higher than it is in

the Netherlands where no one has been arrested for marihuana possession since 1976, so the impact of the criminal justice law, the impact of the criminal justice referring to the United States, is a failure. It's quite clearly a failure, and that is the prevalence of use is higher and, of course, the monstrous costs of the criminal justice apparatus don't even exist in Amsterdam.

The second point of policy was the desire to separate Dutch young people who wished to use marihuana and not marginalize them, make it possible with them to use cannabis and not expose them to the cocaine market.

> Q When you say marginalize them, explain what you mean.
>
> A Well, one of the characteristics of criminal justice approaches and prohibition is that drug users are marginalized. They are criminals. If they persist in their attempts to obtain drugs, they become arrested and subject to indictment, prosecution and imprisonment. For them to obtain drugs, they generally live on the—in the midst of a criminal underworld market, black market, which is illegal, which has very unpleasant characteristics such as the absence of tort and the presence of weapons, and has serious impact on their health because the materials they purchase are often contaminated and of unknown quality.

So that the Dutch felt and expressed quite clearly that it is likely that young people who wish to use cannabis and we would prefer for them not to be marginalized, not to be excluded from the mainstream and the services of a social order which says the use of cannabis does not criminalize you or indeed reduce you very much in the—certainly in the eyes of the law, in the eyes of officialdom. The other point I wanted to make is the prevalence of cocaine in Dutch marihuana users is significantly lower than it is in the United States.

We did do one calculation of again young people twelve to seventeen-year-olds. In the United States, the prevalence of cocaine use is still low in twelve to seventeen-year-olds but it's appreciable. It's about two per cent, 1.7 per cent; while the prevalence of cocaine experimentation in Dutch people, Dutch youth aged twelve to seventeen according to a recent very detailed Amsterdam survey by Professor Peter Cohen is less than one per cent, it's about .6, .7 per cent, and so a Dutch policy in which marihuana is made available under controlled but circumstances which do not result in criminal justice actions has neither increased markedly the prevalence of drug use, particularly cannabis use in young people and Dr. Cohen's survey indicates that the median age for beginning cannabis use in Amsterdam residents is age twenty which is very interesting and to some degree surprising, so all the Dutch young people may legally purchase marihuana at eighteen; approximately half of them do not. So the median age of beginning cannabis at age twenty, and the prevalence of use at least in Amsterdam for the last eight years has been pretty much steady, not been any marked increase. Everybody who wants marihuana in the population of young people by and

large have found it and there is an appreciable stop rate. Dr. Cohen estimates that ten per cent of cannabis users stop every year in Amsterdam.

So we've written extensively about Dutch drug policy because it to us is infinitely preferable. Removal of young people from criminal justice approaches, removal of arrests for possession of small amounts of marihuana, the decriminalization of marihuana has resulted in no obvious harm and to us and we've tried to document them, significant benefit both to the nation and to Dutch youth. The Dutch government does not spend billions of gilder on arresting people for marihuana possession. There is no obvious havoc because of the marihuana dealing. It's actually quite civilized. If you enter a coffee shop, you'll find that it's a civilized, polite retail transaction. And the prevalence of cocaine use in Dutch young people is less than it is in the United States, where we have experienced a Draconian regime of criminal justice intervention into the cannabis market.

Q So what lessons can we draw from this from a public health perspective, what the public health situation was there in '76 and what's it like now twenty years later in 1996?

A There has been no emergence of significant biomedical toxicity because of the easy availability and retail marketing of cannabis. I believed in 1976 that marihuana was a relatively safe—had a wide safety margin in terms of its biomedical toxicity, so did the Dutch and the Dutch have enacted a policy which says we see no evidence of significant harm from the ingestion of marihuana in our young people. There are no publications indicating that this policy has resulted in biomedical harm and increased prevalence of automobile accidents, lung disease, arrested sexual maturation, et cetera, et cetera.

The second point is that Dutch young people are not, if they wish to purchase cannabis, not compelled to deal with individuals who do cannabis, cocaine and heroin, et cetera, et cetera. The idea may be that if there was a threshold or a stepping-stone phenomena, it was in criminal contacts that one had to make to obtain cannabis, that your seller of cannabis might well be a seller of cocaine. In Holland that's not true. Seller of cannabis is identified individual working in the retail market at your corner coffee shop.

So the Dutch public health experiment, to us, and we've tried to document it clearly, has been a fantastic success and needs to be emulated internationally.

Q The quote that appears at the end of the chapter, 20-6, is taken from the footnote 26, Drug Policy in the Netherlands, Continuity and Change, 1995, a fairly recent document, does that succinctly summarize the Dutch perspective in terms of their approach from a public health point of view?

A Oh, absolutely. It's really a public health statement, isn't it? Cannabis is not very physically toxic. It mainly affects mood, consciousness and memory and its effect is dependent on the amount used. Neither fatal overdoses, nor physical dependency, can occur. Cannabis use generates less aggression than drinking alcohol and is certainly not an automatic step on the road to use of hard drugs. Everything that we now know lends to the conclusion that the risks of cannabis use cannot in themselves be deemed as unacceptable.

I might add a brief note, that the reason the Dutch made this statement is because their attack has been—their policy has been under concerted attack by other European nations, particularly the French and the Swedes, and of course by the ever-present attack from the United States. The United States sends DEA agents to yell at the Dutch. America tries to pressure the Dutch in every way. American spokesmen, the drugs are—

MR. DOHM: These statements no doubt fall within his qualifications as an expert in health, Your Honour. I'll reserve my right to refer to this evidence in argument, whether it should even be admissible.

THE COURT: I accept that, that that will probably occur to the question of argument.

MR. CONROY:

Q Carry on then.

A The Dutch policies come under significant attack. The American drugs are—Lee Bennett said that he had been to Amsterdam and seen the young people behaving as zombies in the park. He said that to the Washington Post, a national news outlet in the United States, and American spokesmen, when asked about Dutch policy, point to Interpol data to show there's been an increase in criminality in Amsterdam. It turns out, of course, there's been an increase in criminality in every European city of an approximately the same amount. And other such statements were made about what a horrible failure Dutch drug policy is.

Q Do they—have they commented specifically on the public health differences—

A It's—

Q -- between the United States and Amsterdam or Holland, for example?

A Essentially not at all, although it's included. They tend to fall—I think most American critics of Dutch policy fall back on the old moral arguments, zombies in the park, increased levels of addiction to drugs, moral deterioration of the cause of easy exposure to cannabis. I've not seen—and mostly, frequent repetition of the fact that in three nationwide surveys, nationwide being the Netherlands from 1988 to 1992 done by the Dutch National Institute on Alcohol and Drugs that there was an increase in marihuana use. This is the first time the Dutch did much in the way of surveys.

In the country at large, this was a period of time of increase and Amsterdam, during comparable time, there has been no increase in young people in terms of prevalence, so this figure is cited over and over again, the Dutch young people are increasing use and therefore terrible things are happening, without any documentation of terrible things happening.

Q The—there was a comment earlier about ability to obtain funding to do research and so on and how difficult it is in regimes where there's—a prohibition is respected in terms of getting the funding. Do you know if it's different in Holland? Because of the different approach is it easier to get funding to research different aspects and so on?

A Well, I think it's easier, although it may not be enormously easier. I'm currently corresponding with Dr. Robbe and one of his associates about doing a study of marihuana in the street in the treatment of migraine headache and they worry that it's going to be difficult to obtain the funding and the marihuana the way all researchers do, but at least the protocol is being considered for—or will be considered for its utility and correctness and I'm not sure that such a protocol would be viewed without hostility in the United States. But I can't say for sure that the Dutch researchers are finding it easy to get money to do marihuana studies. The Dutch are not very interested in marihuana studies at a certain level, because they have made a policy decision which seems to them to work and they don't believe the drug is very dangerous, so there's not a great deal of intensity for us to do marihuana studies in the United States.

Q What I'm curious about is the Robb study.

A Yes.

Q Has funding from—

A As you know, the Robb study was funded by the United States.

Q And so what I'm asking is is the U.S., because it's not making it available or funding is hard to get or to research in particular points in the U.S. are—is that why they're going to the Netherlands, or do you know?

A I don't know. I—in fact, I think probably not in this instance. Robbe and his colleagues have made such a reputation for their ability to evaluate the impact of drugs upon driving that the United States federal government, not NIDA, but the National Administration of Highway—the National Highway and Traffic Safety Administration, NHTSA, N-H-T-S-A—

Q Right.

A -- went to the Dutch to perform this study for them and they went because the Dutch could do it and Robbe and his colleagues have a strong reputation for their ability to do these studies and while strict—including the closed highway section and things of that sort. So the United States has not approached Holland to do any other drug studies for them, of which I am aware.

Q And given the—I guess you don't know whether it's because of the results of the Robbe study, I think you mentioned that if your results were too positive in some research that that would often lead to lack of funding in the future.

A I think it has. Such a thing has happened in the United States. The Robbe study has in my experience not been mentioned by any United States federal government official in the Department of Health and Human Services except one scientist who mentioned that he feared Robbe had used too low a dose. Other than that, the study in the American federal government administration might well not exist.

Q All right. That essentially takes us through the manuscript. You've got a section in the Table of Contents saying Conclusion, Science Politics and Policy and then there is also Myth 1, new research shows marihuana is a very dangerous drug and that hasn't been completed yet.

A Correct.

Q Am I right in assuming that that's sort of a summary of everything we've talked about, sort of an overview then?

A Exactly so, with the conclusions that marihuana is a dangerous drug, which has been promoted in the United States and that new research has shown this to be true make up our Chapter 1 and Introduction.

Q I'd like then to take you fairly quickly to the report of the ARFWHO from 1981, I believe published in '83. You have a copy of it in front of you. It's in the Crown's Brandeis brief at I think it's Tab 1.

THE COURT: Do you have an exhibit number for it?

MR. CONROY: That is Exhibit—

MR. DOHM: Exhibit 5.

MR. CONROY: -- 5.

THE COURT: It's going to be on the—

MR. DOHM: Volume 1.

THE COURT: -- on the trolley over here, I believe.

MR. CONROY: Yes.

THE COURT: Volume 1?

MR. CONROY: Yes.

THE COURT: It's going to be a very fat book.

A I have only a summary chapter.

MR. CONROY: Yes. That's all we have.

A Okay.

MR. CONROY: We have an additional one here, if it helps.

THE COURT: If—

MR. CONROY: Maybe I can—

THE COURT: If you have an additional one, I'll—if I could just borrow that and—

MR. CONROY: Yes, maybe that's the easiest thing.

THE COURT: -- carry on. Although I see it has a few marks on it.

MR. DOHM: There's nothing scandalous—

MR. CONROY: I don't think so. It's not my writing either, so—little marks, stars and asterisks and lines which if there's four of them, it means it's very important.

Q So it's the report of the ARFWHO, and that's Addiction Research Foundation World Health Organization, scientific meeting on adverse health and behavioural consequences of cannabis use, a meeting in Toronto, Canada, March 30th to April 3rd, 1981. And the document we have, as I understand it, summarizes a large series of volumes, no doubt, about that entire meeting.

A It's actually published as a single volume. It's still available and is a very comprehensive 1983 survey of the published medical literature regarding adverse consequences of cannabis. The decision was made by the ARF staff to not deal with therapeutic effects or any benefits of cannabis, but to try to cover the adverse consequences of cannabis use.

Q And my recollection is is that in terms of the therapeutic benefits, they make reference actually to a different review that's been done by the Institute of Medicine National Academy of Sciences—

A In the United States, yes, that's correct.

Q All right. The beginning of it, the introduction essentially explains what happened and how everybody came together in order to conduct this assessment. We're talking up to 1981, even though it was published in '93, so I assume I'm correct based on what we've gone through, that there's been quite a bit that's happened since then—

A That's correct.

Q -- in the last fifteen years, but nevertheless, this provides us with a pretty good statement of what the situation was like up to 1981?

A That's correct. It was able to—the presenters were able to review the field studies of the 1970's which we discussed. The growth of marihuana research in the

United States certainly began in the early 1970's so that this document in 1981 had a lot of published information to review and to deal with.

Q Now, the mandate, as I understand it, is set at the top of page 2 was to consider only the scientific clinical and epidemiological information concerning potential and actual hazards to health from non-medical cannabis use and so the focus was the issue we've been talking about in terms of public health?

A That's correct. Toxicology, damage to humans, public health.

Q It also excluded from its consideration control policies and policy recommendations and so on in order to try and remove the value judgments that go into those issues?

A Yes. They tried to do that.

Q And then it defined the meaning of terms so that there'd be some clarity or some consistency, I suppose, amongst the members, is that right?

A That's correct. There's a lot of discussion about such terms as amotivation which we spent a lot of time on, and the meaning of the term narcotic and the meaning of the term dependence and addiction. There was a lot of discussion.

Q But also, I see at page 2 and 3 the definition of adverse effect, for example—

A Mm hmm.

Q -- intoxication versus toxicity, acute versus chronic and then on to page 4, rates of use—

A Yes.

Q -- so that there's a common definition, and I see—

A That's correct.

Q I see that the adverse effect definition that they use, and tell me if you accept this one and agree with it, an adverse effect of cannabis use may be considered to occur when such use produces impairment of an individual's biological, behavioural or social function.

A That’s correct, but then the next statement, of course, which talks about adverse respiratory effects would be acceptable to all—

Q Right.

A -- that to identify a distortion of the passage of time when one is high on marihuana or some intrusion of other thoughts that the marihuana user might consider these beneficial—

Q Right.

A -- one of the reasons he or she uses the compound, but still these are going to be listed as adverse effects. They have those consequences in this document in this context, and that’s not unusual, of course.

Q And that’s why we have to know—

A Yes.

Q -- what they mean by adverse effect.

A Correct.

Q But your point is that others would say it’s not an adverse effect.

A Yes.

Q And I assume it’s similarly intoxication versus toxicity, as the document says. One person’s intoxication is another person’s toxic reaction.

A That’s correct.

Q Okay. And whereas for acute, we’ve been talking about the immediate sort of effects from immediate use in the short term, chronic we’ve been using that term in terms of long-term effects if a person uses on a regular basis?

A Correct.

Q Okay. Now, as far as rates of use are concerned, page 4, the indication in this document was at that time in any event it was difficult to define rates of use, so that as I understand it—and again, heavy use in one society may be perceived as light in another, so that again,

there’s these different perspectives one has to take into account.

A Correct.

Q But it then says,

"The only satisfactory solution is to specify the use rates quantitatively, highlighting patterns of consumption, route of administration and the potency of the material, as well as the total amount used in a unit time."

That’s a fair—

A And this also reflects the fact that in other cultures, cannabis use had been heavy in some members of the society for extended periods of time, but in the Western world in 1981 there had been no lengthy period of heavy use among Western users and the document tries to take that into account.

Q Okay. The first section then deals with general toxicity of cannabis preparations and goes on to deal with lethality and pages 6 and 7, studies in experimental animals and with humans and seems to go through a general overview of a number of problems until page 10 where cellular toxicity is specifically dealt with. Do you have any comment on the general toxicity? I mean, we’ve talked about a good part of it already, I think.

A Mm hmm.

Q But is there anything in there that we haven’t talked about or that we should bear in mind the recent material?

A There’s nothing in there that we have not discussed in my lengthy time on the stand. I would make the overall comment that in 1981 the editors of this text were indeed being careful and conservative and judicious. Their speculation about respiratory damage in humans is, I think, quite conservative and they fear that major complications of chronic cannabis smoking might emerge, so they make that statement strongly, so I just want to make the point that overall, this is a conservative document and probably it reflects its composition by toxicologists who tend to write conservatively and worry that although we haven’t seen much proof yet in humans, we worry that the cellular studies and the animal studies may reveal important

toxicity in humans, particularly in the context that I already mentioned, that Western chronic use was not very real at that time. So I only wish to say that we've discussed everything that's in this document. The document stands as a conservative somewhat fearful presentation that chronic cannabis use may produce a series of harms, none of which we yet have proof of in humans, such as immunotoxicity, respiratory toxicity, sexual development, fertility, damage to the fetus. We worry that these things may occur. That's the tone of the document.

Q There was one I noticed that I don't think we did deal with and I—maybe you can tell me whether it's continued to be a health concern or not and that was gastrointestinal, there's a reference at page 9 to affecting the stomach and so on from use. Has there been much done on that since this time?

A There has been almost no interest in the gastrointestinal effects of marihuana, either in animals or humans' systems.

Q In terms of the respiratory issue, I see at page 8 the actual comment in the middle of that paragraph just above the heading cardiovascular toxicity, the comment,

"In the light of increased frequency of cannabis use, knowledge of the natural course of pulmonary disease suggests that the next three decades may demonstrate an increased prevalence of severe pulmonary disease and possibly lung cancer."

This is something we've now—we're fifteen years since this document was produced, so half that period of time estimated, and your evidence yesterday, as I recall it, was that that hasn't—prevalence doesn't seem to have appeared, is that—

A Fortunately, that prediction did not come true, and I point out that there had not been a prospective study conducted of the sort that I described to you by Dr. Tashkin (phonetic) at U.C.L.A., looking carefully at pulmonary function in chronic marihuana users. We spent a lot of time talking about the cancer issue, that there is currently no proof that cannabis is associated with cancer, but I took the conservative stance that one cannot entirely rule it out because there are changes in the cells of cannabis smokers that are pre-cancerous, but I'm optimistic that the doses smoked is so low in cannabis users that significant increases in pulmonary

cancer due to cannabis smoking will not emerge, but I do not know.

Q Now, you've had an opportunity to review this document before.

A Yes.

Q And so without me taking you through every section and having you comment on each one, many of them appeared to relate to the same headings that you've dealt with in your manuscript.

A Right.

Q Is there anything that you would point us to or that we should be—

A No.

Q -- concerned about or there's been a very significant change since '81 that you could draw our attention to? I mean, I could take you—let me take you through the main headings. Cellular toxicity is the one at page 10 which relates to your myth chapters 6 and 11, body fat and brain cells and so on.

A Yes. The—it opens with a discussion of the chromosomal aberrations and the possibility that there is cytogenetic damage and I think those complaints have basically been eliminated from possibility, not entirely so, but there is no acceptable evidence that marihuana causes chromosomal disruption. I will comment briefly on the carcinogenicity at the bottom of page 11.

Q Right.

A And this refers to the early study by Novatny (phonetic) that there's more benzopyrine in marihuana smoke than in tobacco smoke. I think that's not true. I gave two citations in my document about more recent studies that indicate that benzopyrine levels are essentially the same, whatever they might mean.

The immune system which begins at the bottom of the next page.

Q Page—or topic number 4, page 13, yes.

A Again, this was 1981. Individuals were still dealing with the erroneous publications of Dr. Nahas (phonetic) which claimed to show failed lymphocyte transformation

in marihuana smokers. Dr. Nahas' work had actually not been corroborated by this time and it was still being discussed. There was impairment in the lymphocytes of marihuana smokers and this might relate to impaired immune response. I have taken a strong stance that there remains to this date no evidence that marihuana provokes any anti-immune effect in humans. There's never been a single study showing that human marihuana users are more susceptible to bacterial, viral or parasitic infection or infestation and this has been on the research agenda for a long time and it will probably remain on the research agenda, but there is no evidence that marihuana is immunopathogenic in humans. No evidence.

Q This summary of all the current literature on that is in your Chapter 7 on—compares the immune system myth, correct?

A Comments on—the effects on the endocrine—

Q Endocrine function—

A -- function, number 5.

Q Page 17.

A I think these comments parallel to a large degree mine in animal studies that an acute adminstration of large doses of THC that one may see alterations in certain hypothalamic pituitary hormones. Even in animal studies, these appear to be evanescent and indeed, if one continues the animal on cannabis, they tend to disappear, perhaps as a result of tolerance. The speculation that marihuana reduces testosterone in humans, I spent a great deal of time on. I think it does not. There's some slight possibility that a large acute dose might give an effinition (phonetic) to decrease, although in general, not even that's been able to illustrate. Although marihuana in high doses of THC in high doses may interfere with the fetus in animal studies, there is now, I think, significantly no development, no evidence that pregnancy is remarkably affected by cannabis in humans, and I cited the studies of Tenis (phonetic) and Linn and even the studies of Nancy Day, who has feared that some adverse effects may occur to show that pregnancy and fertility are not apparently altered by cannabis use. There's much speculation in here that they might be so. Actually, I've skipped ahead to some degree to reproduction and development.

In Chapter 5 there is the speculation that cannabis use in adolescence might interfere with sexual maturation, might interfere with secondary sex characteristics. I think gynecomasty is mentioned here once again. I would say that at this date in 1997 there is absolutely no proof of any sort that marihuana use by adolescents has anything—has any impact on their sexual development or sexual maturation, none. The reproduction issues I have talked about—

Q That's page 21 and again, that would—

A Yeah.

Q -- relate to myth numbers—well, number 9 again.

A Particularly the issue of teratogenesis and you will note that this document mentions some early publications by Dr. Freed, the Ottawa psychologist whom I spent a great deal of time on yesterday.

Q Right.

A His early studies indicating that there's a possibility of some differences in behaviour and development of the offspring of cannabis using women in Ottawa compared to tobacco and non-drug using women and I spent a lot of time discussing Dr. Freed's findings and think they do not amount to an indictment of cannabis as a danger to the fetus, not that I recommended that pregnant women use cannabis.

Q Let me go to page 23, effects on the nervous system.

A I—reading this last night again, there's really not much difference in terms of what I said that acute effects, brief effects on memory, are quite clearly present, brief effects on the estimation of the passage of time, other brief effects on cognition are part of the cannabis psychoactive experience. There is no evidence of persistence of those effects and I actually realized last night as I looked at it again that in terms of evaluation of chronic behaviour, that in chronic toxicity of the sort that I've talked about, neurotoxicity in animals as published by Dr. Heath, this document was actually quite unaccepting of Dr. Heath's finding at the time, which was not true of other people who have reviews, and so the writers deserve some credit because, as I said, Dr. Heath's claims of neurotoxicity in monkeys have been thoroughly disproved. I might say that—well, it actually leads into the driving, so let me—

Q Right.

A -- wait until we're ready to do that. I don't think there's much else.

Q The driving refers extensively to the study by Klonoff (phonetic) --

A Yeah.

Q -- which was the one at U.B.C. here in British Columbia.

A That's right. Dr. Klonoff had done some studies and had done some reviews of his publications are quite conservative, although he did note that in some driving studies, cannabis drivers not only performed as well on the rating scales as sober drivers, that in some scales they rated better. Dr. Klonoff actually is the first person I think probably to ever raise that possibility, that cannabis drivers became more careful and therefore since the rating scale gave people credit for being careful, the cannabis drivers were better, so Dr. Klonoff was—heralded what I've talked about a good deal, that cannabis drivers may indeed be more careful as was manifested to some degree in the studies of Robbe and again, this document is quite conservative, worries about cannabis' contribution to road accidents. I think the document did not have the benefit of many studies which have shown a very slight impact on actual driving performance, actually not even much impact on the simulator. Robbe's study, which we've discussed extensively, and I would point out this study did not have the benefit of the large number of epidemiologic surveys from North Carolina, California, Canada, which I cited which showed the relatively low occurrence of positive blood measurements of THC in fatally injured drivers. In fact, it is our estimate, I don't know that I ever said it, that finding cannabis in three to ten per cent of people fatally injured in motor car accidents may not be much higher, if at all, than the prevalence of positive THC we'd find in a random sample of North Americans. In other words, if I asked for volunteers in a large room, I might find a three to ten per cent positive rate for cannabis in the population, particularly if that reflected younger people. So that I have interpreted these epidemiologic findings in a way to indicate that cannabis cannot be blamed for fatal automobile accidents in North America. This document did not have the benefit of most of those studies, although some of them had occurred by that time.

Q I noticed that that section recommended a number of follow-up studies and prospective studies and

independent—the need for independent replication and so on, but the major study in this area, the most up to date one and the most comprehensive one again is the Robbe study.

A That's correct.

Q Okay.

A It's important to say that people continue to worry about drivers intoxicated on cannabis and indeed, it is a worry. It's a real worry and some people who are risk-takers may be ingestors of cannabis. I've referred to that briefly. But overall, cannabis cannot be indicted as a cause of automobile accidents in North America.

Q I notice the comment at page 27 after the heading Chronic Effects on Behaviour at the bottom of 26 and then you go to the section on humans at page 27 --

A Right.

Q -- and it first talked about the short term memory issue and concentration—

A Mm hmm.

Q -- on tasks, but then there's this comment,

"The field studies of long-term heavy users so far conducted have shown no major changes in social behaviour."

And they cite Rubin and Comitus (phonetic), Fink and True, but then refers again to problems in the design of the studies and so on.

A We talked briefly about those. Those, of course, are the United States funded studies in Jamaica, Costa Rica, and Greece, and the studies almost universally showed no differences between cannabis users and non-cannabis users in the culture, both in terms of biomedical toxicity, pulmonary function and electroencephalograms, and social behaviour. Now, the criticisms in that paragraph are proper. These are small groups. It was difficult to construct control populations. There is a possibility that there was some consumption of cannabis by control populations and some consumption of cannabis by individuals being tested who were supposed to not ingest cannabis on the day they were studied, so there were many potential problems; however, the overall

surprising preponderance of evidence in all the field studies was that chronic users of cannabis in those cultures did not differ in any important fashion from abstainers of cannabis in those.

Q Your report then goes on to deal with neurotoxicity and from my reading of that part, I don't think—and correct me if I'm wrong—that there's much different there from what you spoke about. I mean, you've updated it with the more recent findings?

A Yes, there's—notice the discussion of electroencephalograms. We spent a fair amount of time talking about those findings. And again, the important—this study—this document did not have the advantage of the National Centre for Toxicology studies in Arkansas, the extensive publications and the cannabis exposed monkeys by face mask and absence of any evidence of damage to the central nervous system by year long exposure to fairly high doses. Those have made me feel that that kind of cannabis exposure is not harmful to the brains of rhesus monkeys and may reflect a relative safety margin in humans.

Q It goes on then at page 29 to do with the amotivational syndrome and I saw the sentence in the middle of that first paragraph which seemed to summarize what we were discussing the other day,

"A variety of clinical studies and reports in the past decade clearly reveal, however, that the amotivational syndrome is neither diagnostic of nor specific to chronic cannabis use."

A I very much agreed with that statement.

Q And it goes on then to do with residual brain damage, but I think—that's at the top of page 30, it says,

"There's no evidence of residual brain damage."

And then on to psychiatric effects and that is not within your area.

A I did comment yesterday about the various syndromes related to psychiatric diagnosis such as the acute panic attacks—

Q Yes.

A -- the putative cannabis psychosis, the possibility of precipitation of schizophrenic symptoms or interference with therapeutic intervention to the schizophrenia, this section beginning on Chapter 31, I think is largely correct, and indicates very little evidence that cannabis is an important cause of psychiatric illness in Western culture. This was before, of course, the Swedish conscript study which we spent a lot of time in discussion, but I think this is a quite accurate summary of what was done in 1981 and is not much different today. That is, cannabis does not appear to be associated with major psychiatric illness.

Q Okay.

A And it also comments, I was pleased to see, on the apparent decrease in the acute panic attacks being reported in the Western world and I had said that quote yesterday.

Q But then page 34 deals with epidemiology and we've talked about that. Is there anything in there that—

A No.

Q -- you should have brought to our attention particularly?

A I think not. On page 36 and 37 there is the dilemma that the writers in 1981 had of trying to ascertain the epidemiology of adverse reactions and we spent a lot of time talking about that. What do the Don reports from American emergency rooms mean? What do we know about reported adverse reactions when many of them are case reports? We spent a lot of time talking about the fact that there is no medical literature indicating that cannabis smoking causes lung cancer. In fact, I note that earlier in this document there is some discussion of one case report and one individual, but this—these statements on 36 and 37 cover quite well the difficulty of trying to ascertain in small populations of heavy cannabis users, if there are adverse effects, difficulty I talked about in construction of control groups to carry out such studies. These are good statements on pages 36, 37, 38.

Q I noticed even before that at page 35 the reference, third paragraph at the bottom of it, it talks about other studies and the need for other studies, and it then says,

"Until such studies are carried out, we can have only rough impressions, at best, concerning the real management of cannabis-related health problems."

Is that the case today, would you say that today?

A No, I wouldn't say that today. We have significant information and I tried to review that for you. I do not give cannabis a clean bill of health. There are no completely safe drugs and under certain circumstances of use, the drug has adverse effects, but I think we know a great deal about cannabis' toxicity and as I said in the court, it's in the last twenty years has been the most widely-studied psychoactive drug in the universe.

Q And I'm going to come to that, because on page 36, in the fourth paragraph, it talks about scarcity of studies and talks about lack of finances and trained people to carry out the surveys and the relatively low priority allotted to cannabis in the health sector, both nationally and internationally.

A Yes.

Q Is that consistent with this huge amount of studies that have been done?

A Well, I think the priority changed. In fact, this was written at the beginning of the change in priority in the United States in which there had been increasing concern, increasing political concern by parents' groups expressing the fact that NIDA was not giving them enough information about the harms of marihuana and this provoked a large number of studies looking for harms, and the growth and weight of the cannabis literature in the United States since 1980 is at least in part related to looking for harms.

Q And yet we then do have those statements that you've drawn to our attention, starting at the bottom of page 36 and continuing on 37 and 38, which seem to be conclusions arrived at in terms of adverse effects—

A Mm hmm.

Q -- at least up to that point in time.

A And of course, this document does make clear the point that many of the adverse effects are case reports and studies of very small populations. It's notable that Dr. Tenant (phonetic) made such an important contribution to this document. Dr. Tenant was a United

States military physician who studied a group of hashish smokers in West Germany, American military personnel stationed in West Germany, and he wrote a number of reports on the terrible things that resulted from this consumption of hashish and yet in most of those reports he seemed not to emphasize the fact that ninety per cent of the hashish smokers were heavy tobacco smokers and he had a large impact on this meeting. He presented one of the sections. His name is all over the documents and he made a contribution much greater than the merit of his studies.

Q The document then goes on to talk about persons in groups at special risk, those most likely to use, those at risk of adverse effects on health. I think we've—

A I'd make only one comment. The document signals the concern of Western culture that adolescents are particularly vulnerable to harm from cannabis, and in fact that's mostly what we have talked about in reality in the last two days, the adolescent vulnerability to cannabis is particular dangerous for young people. It was a concern in 1981 that remains a concern today.

Q It then goes on to deal with general considerations and again, I think we've probably covered a lot of this and only if you think that there's something very new that we should focus on. Dose response relationships is the first part.

A I have—I think we know a little bit more about dose. I talked particularly about dosage in Robbe and the fact that the dose of a hundred micrograms per kilogram is well above that known to cause psychic effects from cannabis. I won't say much more about that. There is some discussion here of tolerance.

Q Right.

A It's now quite clear that tolerance to cannabis occurs in many spheres. Tolerance meaning not necessarily a bad thing but often a good thing in individuals who expose themselves to high doses of a drug may have a diminished effect of that drug with continued use. It raises again the lengthy and difficult discussion on dependence and particularly a kind of physical dependence and again, this report relies heavily upon the studies of Dr. Reece-Jones, who may have given testimony in this or other Canadian cases about—

Q Not in this case but in Hamon.

A Yes. And Dr. Jones took a group of individuals and put them in a hospital setting and gave them the equivalent of twenty marihuana joints by mouth every day and after thirty days stopped it abruptly and people complained, and those complaints have been stated as constituting a kind of withdrawal syndrome and you'll note that this report believes that, that there is a cannabis withdrawal syndrome.

I'm quite taken by the fact that Dr. Jones' study, which is cited over and over again, gave the cannabis by mouth, which markedly changes the psychoactive effect of the drug, changes the display of metabolites, increases the concentration of 11 Hydroxy-THC and it's the most commonly cited human study that shows withdrawal from cannabis and I gave to the Court the early study by Dr. Isobel Dylexington (phonetic) on a narcotics hospital in which he kept men high every waking hour for thirty days on smoked marihuana and then when it was stopped, he could find no evidence of any withdrawal symptom, so we are still in a contest about the withdrawal syndrome. I do not believe it occurs to any significant extent in humans and it has very little meaning in terms of continued cannabis use.

Q Most of the rest of the document seems to deal with experimental design and things of that kind.

A Yes.

Q And then summary or conclusions at page 51. Fair enough. Okay. Now, just have a moment.

I don't think I asked you this earlier, but medically or pharmacologically, a narcotic is what?

A To a pharmacologist a narcotic is generally used to describe the opium plant, its derivatives and synthetic compounds relating to the opium plant and its derivatives. Pharmacologists believe the discussion of narcotics should be centred on and inclusive to morphine, heroin, meperidine, methadone, codeine, et cetera; however, the term narcotic has been used in a much, much broader fashion, often in a legislative sense.

Q Right.

A That it was an early term for dangerous drugs and it's still included—cocaine and cannabis are listed in some lists generated by—

Q Would you—

A -- legislators of narcotics.

Q -- from a medical or a pharmacological point of view, would you include marihuana in the definition of a narcotic?

A No, I would not.

Q Now, I wanted to just very quickly refer you to some of the materials in our Brandeis brief, just so that you could comment on the ones you're familiar with in terms of—well, what value they can be to us. Let me do this. I think we've got an extra copy. It's Exhibit 18, and I'm just really probably just taking you through the index, but certainly if you want to refer to the specific documents they're tabbed accordingly.

A Thank you.

Q There's a number of them that you probably aren't familiar with. They're more to do with the legal issues, such as the first two or three actually.

A Mm hmm.

Q The two articles by Neil Boyd and the one by M. Bryan, but the work of Patricia Erickson on Canadian cannabis policy, are you familiar with that one?

A Yes, I am, and actually that work in part led to a text that Dr. Erickson wrote called Cannabis Criminals and we frequently refer to that work in our monograph.

Q And she is with the Addiction Research Foundation in Toronto—

A Toronto.

Q -- at least—and that's a 1995 publication?

A Yes, and she still is.

Q Okay. Then we have Gruber and Pope—

A Yes.

Q -- from the American Journal of Addictions, you're familiar with that one?

A Yes, I'm familiar with that paper.

Q Any comment or anything we should—

A No. Dr. Pope has been frequently referred to because of a number of studies. In this one, he expressed doubt that the cannabis psychotic order—disorder existed and we've discussed that.

Q Okay. Then we have Kouri or Kowrie (phonetic), Attributes of Heavy Versus Occasional Marihuana Smokers in a College Population, also a 1995 publication from Massachusetts.

A I've not read that publication. Do not know its contents.

Q Then Ethan Nadelmann, Harm Reduction Approach to Drug Control.

A Yes. I actually contributed editorial comments to that document. I'm very familiar with it.

Q And that's really dealing with the different approaches—

A It's actually never been published as an independent publication.

Q Eugene Oscapella, Witch Hunts and Chemical McCarthyism, the Criminal Law in the 20th Century Canadian Drug Policy. I believe you're familiar with Mr. Oscapella but this again is more of a social policy than legal.

A Well, again, yeah, but it comments specifically on urine testing and the value of urine testing and I made a number of contributions and suggestions to Mr. Oscapella regarding the movement of American-style urine testing to Canada.

Q Okay.

A He and I agreed that it was not a good idea.

Q And then we have Shedler and Block, Adolescent Drug Use and Psychological Help, a Longitudinal Inquiry and that's the same Mr. Block that we've referred to a number of times?

A Yes. The Shedler and Block study is a provocative one in that it—while assessing the social and happiness adjustment of a group of adolescents discovered that moderate users of cannabis appeared to have made better psychological adjustments than heavier users and

abstainers and the publication of the study, which is part of an ongoing study of adolescent development provoked much commentary which Shedler and Block stood by the criticisms that moderate cannabis use was not incompatible with perfectly normal adolescent development.

Q Then an article by R. Smith in the British Medical Journal which is headed War on Drugs - Prohibition Isn't Working, Some Legislation Will Help.

A Mm hmm.

Q You're familiar with that?

A Yes, I'm familiar with that.

Q And this was obviously put out by the British Medical Journal looking at it from the perspective of public health and medicine.

A Yes.

Q And I note comments on the Dutch experiment and other factors that you've told us about.

A Yes.

Q Then, of course, there's your monogram that you and Dr. Zimmer put together, Lynn Zimmer put together?

A It's a shorter version of the document I've been presenting here—

Q What we've been doing.

A -- for the last two days.

Q And then another article, Deglamourizing Cannabis from the Lancet. The Lancet, as I understand it, is a very prestigious medical periodical?

A In terms of citations, it's the most prestigious medical journal, that is that its work is more widely cited than any other medical journal.

Q And it—you're familiar with this—

A Oh, yes.

Q -- particular article?

A It opens by saying that smoking of cannabis even long-term is not harmful to health.

Q And so again, from the medical perspective, the call in this document is again look at the Dutch approach and so on, harm reduction approaches.

A That's correct.

Q Okay. And then 13 you wouldn't be familiar with. It's a Canadian Bar—

A No.

Q -- submission with respect to some new legislation, but in the second page of our index we have a number of books that are not reproduced in this document.

A Mm hmm.

Q I take it you're familiar with Abel's work, the first—

A Yes.

Q -- one.

A Yes, I am.

Q Marihuana, The First 12,000 Years?

A Yes. Abel is a scientist at the University of Buffalo, who published extensively as a scientist on marihuana, but also is very literate in composition of narratives and wrote very informative texts.

Q Apap, Questioning Prohibition, I'm not sure you're familiar with that. It's a fairly new publication from the International Prohibitionist League in Europe.

A I'm not familiar with it.

Q And then Boyd is a text I don't believe you're familiar with.

A Well, I actually know Professor Boyd and have read portions of that text. Having met him, I then obtained the text.

Q Again, Patricia Erickson, Cannabis Criminals, and that's the follow-up or that's an earlier book to the paper we referred to, of course, earlier—

A Yes.

Q -- 1994. Lester Grinspoon and Mr. Bakalar, Marihuana, the Forbidden Medicine, and that's the book I understand is under revision or being updated.

A Yeah, a new edition in the offing and I was fortunate to read early versions of the manuscript and make editorial comments, so I've been familiar with the text for a long time.

Q And it deals particularly with therapeutic use—

A Correct. Right.

Q And then LeDain, of course, you're familiar with.

A As the winner of the LeDain prize last year, I was quite familiar with his publications.

Q And there's two there, both the Cannabis Report and the final report, both from '73.

A Right.

Q '72 and '73 and then finally, Andrew Wiles, a book, Chocolate to Morphine, that should read Understanding Mind Active Drugs. I think it says—

A It has been updated and reprinted in a paperback version and is widely available in the United States, now probably in Canada as well.

Q Now, I'd like then to conclude by asking you a number of what may seem to be fairly general questions, and I'm not—essentially to try and bring together everything that you've been telling us about.

THE COURT: Mr. Conroy, it's fast approaching eleven o'clock. Would this be a good time to break—

MR. CONROY: Yes.

THE COURT: -- and then we'll do the summary after the break. All right. Fifteen minutes.

(WITNESS ASIDE)

(PROCEEDINGS ADJOURNED)

(PROCEEDINGS RECONVENED)

DR. JOHN PAUL MORGAN, recalled, testifies as follows:

EXAMINATION IN CHIEF BY MR. CONROY continuing:

Q Bearing in mind your investigation and your research into this whole question of health, harm and so on, could you by way of either a synopsis or summary or conclusion tell us what you—what in your opinion is the nature and scope of the health concern, if any, in relation to the possession and use of marihuana?

A In Canada?

Q In Canada. In—not just in Canada. Just worldwide, based on your experience and knowledge.

A Probably because I just read the Lancet editorial as we talked, as you led me through it before, I would probably start with saying that there is no convincing evidence that cannabis has important chronic harm to users. Having said that, I would step back quickly and talk about what I think are the two most important potential adverse consequences of cannabis use. The first is that cannabis is an intoxicating substance. Actually, at times become uncertain about the use of the term intoxicating, but let me say that cannabis is a psychoactive drug which alters to some degree perception, cognition and behaviour, so that users of cannabis must be careful, must realize that they're ingesting a substance like alcohol or other substances which may alter their view of the world for a brief period of time. That's important.

The second issue is that the chronic inhalation of combusted cannabis sativa, the preparation we call marihuana, appears to have at least potential for pulmonary damage. I am struck with two facts, one that heavy users of cannabis report some of the same kinds of respiratory symptoms that heavy users of tobacco do, but I'm also struck with the fact that cannabis users long-term will not, I believe, develop emphysema which is a critical issue and an important fear, so in summary, cannabis is not a completely safe substance; however, among psychoactive substances, it may be the one with the greatest safety margin. Its use has relatively little impact on the public health of this nation or any other and the extensive literature that I have

reviewed for the Court and published in the last twenty years confirms what was thought to be true in the early 1970's, that the safety margin of this drug was of such that perhaps its use should not be so subject to criminal justice interventions and that the harm done to individuals by intrusion of the criminal justice system into their lives appeared to be much greater than the harm of the biomedical toxicity of the substance itself.

Q Are there any pressing and substantial risks that you see from the use of marihuana?

A Well, pressing and substantial have to do with the intoxication. Although, as I believe that people learn to manage the intoxicating effect quite well, and I'll take this opportunity to say that our education intervention needs to be turned away from the do not use, do not ever touch, just say no, resist at all costs; our educational effort needs to be turned to for those who have decided to use cannabis, helping them keep safe, keeping them out of harm's way. What I did with my children and what I think most of us should be doing, if the children decide to use cannabis and we have relatively little impact on whether they shall decide to or not, that our responsibility as educators and public health people is to tell them how to keep out of harm's way when they're intoxicated.

Q And your focus there is at a particular age group?

A Well, adolescents will use cannabis. I'm not in favour of adolescent use. I guess in a perfect world, if I had influence, I would say don't take these intoxicating substances until you are in your majority, but I can't do that, and it's quite clear that that probably will not happen, so the vulnerability of adolescence is not that it's going to disrupt their hormones or their immune systems. The vulnerability of adolescents is that they're prone to take risks anyway, and they need to be extremely careful with this substance and alcohol and we're not doing a very good job of helping them remain careful. We need to educate them more about how to take care of themselves, how to use the substance in a group of supporting friends, not to drive, not to rappel down mountains, not to ski, those things.

Q We've identified a number of categories as we've gone through the evidence, adolescents being one in particular.

A Right.

Q Another one was pregnant women.

A Yes.

Q Third one was the mentally ill, who may be affected by—an existing problem that may be exacerbated or affected in one way—

A Right.

Q -- or another, and the fourth one is drivers of any age, is that fair, those are the four categories?

A Well, yeah, that's actually a quite fair summary. That is the concern is, even though I've rated—my belief is that overall the drug there's a wide margin of safety, that in those groups that you've just mentioned, the margin of safety is diminished because of their vulnerability, at least their potential vulnerability. So I worry about adolescent use and counsel them about the concerns of their behaviour. I worry about ingestion during pregnancy, not because I think there's convincing evidence that the fetus is at risk, but because it is generally important that the fetus be as little exposed to chemicals as we can make it. The issue of those who are mentally ill being under treatment particularly, yes, cannabis use may impose a particular or peculiar risk for them, and drivers, I—despite having reviewed extensively with you what I believe is a lack of evidence that cannabis is an important contributor to vehicular problems in North America, I think people should not drive under the influence of cannabis.

Q Apart from those four categories, we've talked generally about I suppose two, possibly three others in terms of the regular user—

A Mm hmm.

Q -- the chronic user, the third category I was thinking of was the light, very light user. Bearing those three categories in mind, is there a likelihood of injury to those users, injury of a most serious kind—

A I think the light user—

Q -- to any of those—

A -- of cannabis faces almost no risk of biomedical injury at all. I think his dose of smoke is so low that even with the documented dangers of smoke ingestion with the light use of cannabis will escape pulmonary harm and I think there is no acceptable evidence that he will be

harmed in any way by his use of cannabis, biomedically or toxicologically.

Q And the moderate user?

A I feel the moderate user is—has a likely wide enough safety margin. I know a number of people who are weekly users of cannabis. I think they are probably not at risk of biomedical harm from weekly use of cannabis. Heavy users—shall I go on?

Q Yes.

A Heavy users, of course, face the issue of exposure to smoke, the issue of high dose exposure to smoke. It is possible that they will develop respiratory symptoms. It is possible that they will develop pulmonary cancer, as they begin to approximate the smoke or even come close to the smoke ingestion of tobacco smokers.

I will mention here for you that although I have criticized the few studies in the 1990's indicating some potential cognitive harm from chronic high-dose use, I would point out that the only hints of harm to cognition are in very, very high dose chronic users, and so they represent a very small percentage of cannabis consumers. Our prohibitions seem to have no effect on them whatsoever. We also seem to have been able to deny them access to the substance by prohibition, so although I'm concerned about them, I still don't see that the prohibition system is of use to them in these concerns that I've raised.

Q Taking those three categories to encompass all of the users, you've told us there's not a known documented case of any death from the use of marihuana, so it's not a leading cause of death.

A Correct.

Q Would you describe it as a leading cause of illness in society?

A No, clearly not.

Q Is we are looking at protecting the public from a public health point of view, is there an actual danger as opposed to a threatened danger that we should be concerned about?

A I would even go further. Is there an actual danger versus a mythical danger, which has been stated over and over and over again in the press and in the legislatures of the Western world. I think cannabis is a

drug with a surprisingly wide safety margin, and I think it represents very little danger to the public health and in fact at this moment, I think occasional moderate cannabis use represents almost no potential danger. Now, there's always the chance that I'm wrong and that tomorrow someone will publish a wonderful convincing study to show that there's a—I've made an error and that there is a danger unforseen, but I doubt if that would change my feeling at all.

Q And your feeling, you've talked about all of the scientific studies and so on that have been done and we've also talked about the use over a long period of time, not just in the studies but in the populations, Africa, Greece, Costa Rica, Jamaica, the United States and Canada since the '60's. Bearing the anecdotal and the scientific and all of this information, if there was a threatened danger or actual danger of injury to the public, could we expect to have seen that manifest itself in our daily lives and in the press and so on by this time?

A I think we've crossed that line, although I'm well aware of the scientific mandate to be conservative and careful and I am a representative of Western science and I respect that mandate. I would be very surprised if some large toxicity of cannabis emerged with the history we have and with the available studies particularly those done since the 1970's. We have reached the point now where we can, as Judge Young did in the law suit brought in the United States, say that this appears to be the safest psychoactive substance known to mankind.

Q And so again focusing from a public health perspective and bearing in mind even the definitions in that World Health report, one person's poison is another man's intoxication, if we're looking at the word epidemic, what do you as a doctor or professor or pharmacologist use for that meaning of that term, an epidemic?

A Epidemic refers to two—subsumes two categories: one is a notably high or increasing prevalence of involvement or exposure or use but I would not label something an epidemic unless I could denote its harm, so there is no epidemic of cannabis use, nor has there been one from the 1960's on, because the harms of the drug in the public health aspect are minimal.

Q The types of risks that you have described, particularly in relation to adolescents, pregnant women, mentally ill and even the driving issue, are these issues that local hospitals and local doctors in communities can

deal with or is there something more required from a public health perspective in your view?

MR. DOHM: By local does my learned friend mean within the Lower Mainland, within the Province of British Columbia?

MR. CONROY:

Q It could be within the City of New York, it could be in any number of small cities, something less than a country, the size of a country or a province.

A I agree with the way you've described that, that these potential harms in subsegments of the population clearly are local issues and I see no health requirements other than the application of local remedies.

Q And is there any evidence that you're aware of of this use leading to a higher tax burden arising from high costs of medical care, from people suffering from any types of problems associated with marihuana use?

A No. I believe there is no tax burden resulting from the harms of marihuana to individual users. Or it is in consequential and cannot even be assessed.

MR. CONROY: Would you answer any questions that my friend has, please.

A I beg your pardon?

MR. CONROY: Would you answer any questions that my friend has?

A I certainly would.

CROSS EXAMINATION BY MR. DOHM:

Q While I'm getting set up here, Dr. Morgan, bear with me a little bit, would you just tell us with respect to your last answer about no economic results the studies upon which you base that opinion?

A Well, I don't mind telling you that the issue is in part inferential, since I do not see any chronic illness resulting from cannabis use, then there's no tax expenditure to the public wheel in terms of its support of individuals who are ill.

Q In other words, you have no study that you can point us to for that conclusion?

A Well, I would also just briefly mention—

Q Excuse me. Mr. Conroy's trying to get my attention.

MR. CONROY: I don't mind Dr. Kalant being in the courtroom. I just noticed that—

A He just left.

MR. CONROY: -- he isn't here. If my friend wants him to be here, because I'm certainly going to ask that Dr. Morgan be present when Dr. Kalant is giving his testimony, because I'm going to want him at my elbow in terms of preparing for cross examination. I just thought I'd make that clear at this point.

THE COURT: Do you wish to retrieve him?

MR. DOHM: We will bring him back then. Thank you.

MR. CONROY: Assume my friend has no objection to me having Dr. Morgan around when Dr. Kalant is testifying.

MR. DOHM: Well, if it's good enough for us, it's got to be good enough for my friend.

MR. CONROY: Thank you.

MR. DOHM:

Q Doctor, you worked very hard in the last couple of days. Yesterday you may recall after the close of business wondering how many words you had spoken in the course of the day. Today should be much easier for you. I won't expect lengthy answers from you. In fact, I'm going to ask you precise questions and I will be expecting answers that are yes or no, I agree, I disagree, and if there's a need for explanation beyond that, Mr. Conroy knows how to deal with that in due course. All right? So that may make your role a little easier this morning.

A Okay.

MR. CONROY: If my friend is suggesting that the only way the witness can add an explanation and qualification is through re-examination, I disagree. The witness may

give a yes or no answer, but if he feels some explanation is called for, he's entitled to do so.

MR. DOHM: That is something that Your Honour may have to rule on in each case.

THE COURT: All right. I can let you know perhaps in advance that I have some difficulty in principle with the suggestion that a witness must confine his answers to yes, no, I agree, I disagree. First of all, it assumes that that's one of those forms of answers are the only correct form. I think the witness is entitled when he gives an answer to give his answer, which may or may not include some explanations or qualifications.

MR. DOHM: So long as it is responsive to the question.

THE COURT: Absolutely.

MR. DOHM: Thank you.

Q Now, firstly Doctor, I'd like to deal with your curriculum vitae very briefly, that's Exhibit number 26 if my note is correct. I have been given a copy which consists of thirteen pages and about seventy-five entries, the last entry being an item you wrote, Against Whose Excess, a Review of M. Kleinman's Against Excess, published in the Mats Newsletter. Is that an accurate CV? Is it up to date?

A It's not up to date and I apologize for that. I have probably published three to four documents since that book review and I have three to four documents in press at the moment. I've been tardy in updating my C.V. in terms of publications.

Q Okay. Now, as you stated, near the end of your evidence in chief, you are a representative of Western science, and in that capacity I would expect that you have—I concede from your curriculum vitae that you have published a goodly number of publications. There are different types of publications, and one type as I understand it in the scientific world is called a peer review publication.

A Yes.

Q And that is a process by which a scientist writes a paper and submits it to a journal, and you're nodding in agreement?

A Yes, sir.

Q Thank you. And that the journal will then usually refer that out to other scientists for review or for comment and those comments or review will either come back to the journal and the paper will be published, or they'll go back to the author for further consideration or work, do I have that about right?

A You do.

Q So the peer review publication is an important part of the system of advancing the knowledge in the scientific field, is that right?

A I agree with that.

Q And it's based, as one can see on—quite readily on a safe, careful examination of the work to ensure that all appropriate considerations are included in the work, is that right?

A The—yes, but with a qualification. The structure of peer review provides the opportunity for careful consideration of the scientist's contentions in that paper. The structure of peer review makes that possible. The reality of peer review is that it does not always occur because the reviewers may carry the same biases as the scientist or may be influenced by the tone of that journal, but in essence it is an important part of scientific publication and the structure affords the kind of protections you've just cited.

Q Would you agree with me that the number of a person's peer review publications are a very important method of assessing that individual's scientific qualifications?

A They are.

Q Another thing that I wanted to clarify is that often one will find in a curriculum vitae of a professional person the same paper published in different journals, is that correct?

A That's correct.

Q And that is not simply padding, but it's a method of demonstrating the interest that a particular paper may have received.

A It may do exactly that. It also may indicate a slight difference of approach or addition of some other data. It may not be identical.

Q One of the examples that I found from your own curriculum vitae, which I take is being a sign of you being not a unidimensional person, is the topic The Jake Walk Blues.

A Yes.

Q Which you published in among other places in Old Time Music, music being one of your qualifications. You spent some time in the music department of the university, didn't you?

A That's correct. I just hasten to add for you that the Jake Walk Blues which described to some degree a body of recorded music, was in response to an episode of poisoning that occurred during prohibition in the United States. So my initial approach was to write about the history of the toxicological event related to prohibition and contamination of beverage alcohol and then I stumbled onto this music finding.

Q Good. I appreciate your trying to shorten up that answer. That is—that's what I'm aiming for.

A Okay.

Q As we deal with this topic, we have discussed and you have brought to your attention a number of articles, a number of reports of symposia and two of them are especially large in their review of the work, it would seem to me. One is the Australian report which we have referred to rather short-handedly as the Hall report, and the other is the Addiction Research Foundation World Health Organization report.

A Yes. I'm aware of the use of those two.

Q Now, I'm going to go into these two reports in—well, into the Hall report, at least, in a little greater detail, but not much.

A Okay.

Q Suffice it to say this, and I'm asking you whether my statement is correct or not. On the Hall report, would you agree that the participants in that study, the people who gathered and reviewed that literature and the

people who put that literature together were perhaps with some exceptions you may have named, people who are well-motivated scientists trying to do their jobs?

A I agree.

Q Okay. In the same way that you are a well-motivated scientist here giving your evidence?

A I agree.

Q And the same thing, one could say, for the ARFWHO, again with the limitations that you've made some criticisms of on that one, I think of Professor Tenant or Dr. Tenant?

A I did make some criticisms.

Q But generally speaking, these are well-motivated, competent people performing their experiments and trying to report their results?

A I agree.

Q It just happens that as happens in every field of human endeavour, their conclusions do not always agree with yours.

A That's correct.

Q And you're not alone in—I'm not trying to isolate you either. You're not alone in being a person who considers that there is minimal risk to cannabis.

A That's correct, I'm not alone.

Q What it appears to me that we have here is two competing bodies of opinion within the scientific world, especially in the Western scientific world, on the topic, is that right?

A On the topic of adversity due to cannabis.

Q Yes.

A Yes, I agree. We have competing opinions.

Q Excuse me. I'd like now then to go into the Hall report just briefly and I'll tell you where I'm going to be looking. I'll ask you questions. I'm not—there's no—nothing

tricky in these questions. What I'm going to do is to refer to the executive summary.

A Yes, I'm familiar with that.

Q All right. And what I will do is read to you a portion of the report and ask you whether you agree with it or whether you disagree with it.

A Okay.

Q And when I do that, I want you to realize that we're cognizant that over the last couple of days you have in many ways dealt with these and given pretty lengthy explanations of why you disagree with many of them.

A Yes, sir.

Q I'm just trying for the sake of getting things lined up on the record here in the transcript to list the things neatly that you agree with or that you disagree with.

THE COURT: Could a copy of the report be put before the witness? It is Exhibit—

MR. CONROY: Exhibit 5.

THE COURT: Exhibit 5.

A Thank you.

MR. CONROY: Exhibit 5 --

MR. DOHM: Volume 1.

MR. CONROY: I notice one of our executive summaries is missing from one of our binders (indiscernible) marked. Because otherwise I could give him—

THE COURT: Tab number—

A VOICE: 3.

THE COURT: -- 3?

MR. DOHM:

Q Would you just let me know, Doctor, when you get to that and does Your Honour have a copy in front of you?

THE COURT: Not yet. Can you—are you able to find a copy of that from the trolley that's over there?

A I believe I have the document—I'm familiar with it -- in front of me. I have the executive summary of the text called National Drug Strategy Monograph Series, the Health and Psychological Consequences of Cannabis Use No. 25.

MR. DOHM:

Q And that appears on page 9, Doctor?

A Yes, sir.

Q Thanks. We'll just work right through the page. Firstly, there's an introduction that says,

"The following is a summary of the major adverse health and psychological effects of acute and chronic cannabis grouped according to the degree of confidence in the view that the relationship between cannabis use and the adverse effect is a causal one."

And they list the acute effects. And the first acute effects listed are anxiety, dysphoria, panic and paranoia, especially in naive users.

Do you agree or disagree with the conclusion in the Hall report in that respect?

A I disagree only in that panic and paranoia are extremely rare. Anxiety and dysphoria are common.

Q Next, acute—the next acute effect listed is cognitive impairment, especially of attention and memory for the duration of intoxication. From your earlier evidence, I assume that you agree with that?

A I do.

Q The next acute effect listed is psychomotor impairment and probably an increased risk of accident if an intoxicated person attempts to drive a motor vehicle or operate machinery; do you agree or disagree with that?

A In essence, I agree with that, but I'll add the two quick provisos which I have talked about often, is that cannabis users become careful when they're placed in that situation and in the most important one that we're

concerned with here, driving, it appears to me the evidence would indicate that despite the potential that psychomotor impairment could lead to, there is no evidence that vehicular mayhem is related to cannabis consumption.

Q That's a fairly loaded statement, vehicular mayhem.

A Well, I became—you'll excuse me for becoming stylish. I do not think cannabis use has been shown to contribute significantly or importantly to the prevalence of motor vehicle accidents in North America.

Q Do you—would you then direct your attention to the next—

A Mm hmm.

Q -- acute effect listed which is an increased risk of experiencing psychotic symptoms among those who are vulnerable because of personal or family history of psychosis?

A I agree with that statement entirely up to the word personal. The addition of the or family history of psychosis is unproved, and is an over-reaching statement.

Q So you agree with it in part and you disagree with it in part?

A Yes, sir. Yes.

Q Thank you. The next acute effect is listed as an increased risk of low birth weight babies if cannabis is used during pregnancy; do you agree or disagree with that?

A I disagree.

Q And when I see that as an acute effect, I am compelled to ask you as well would you see that as a potentially chronic effect?

A Well, I think so. I mean, my immediate feeling is to agree with you that if cannabis were to induce low birth weight, it's unlikely that it would do so from one or two ingestions and so chronicity during some period of the nine months gestation would be implied, so I'll stop there.

Q Just to make sure I understood you—

A Mm hmm.

Q -- and tell me if I misstate what you—what I think you have said—

A Mm hmm.

Q -- I understood your answer to be that chronic use of cannabis during pregnancy may contribute to an increased risk of low birth weights?

A No, I'm sorry. You do misunderstand me. Let me quickly state my belief that there were early papers published associating low birth weight with the use of cannabis and that means cannabis caused the low birth weight because of maternal consumption of cannabis at some point during the nine months gestation period. I was using the word chronic because I thought you and I were in agreement that use over a nine month period for some time is chronic. That's more than one isolated use, but I would go further with my disagreement because I think modern day studies have shown that cannabis consumption during pregnancy is not associated with an increased risk of low weight babies.

Q Okay.

A Is that clear? I'm sorry?

THE COURT: So when you were talking about the words acute and chronic—

A Yes.

THE COURT: -- you're suggesting that it's misclassified.

A Thank you very much, and I thought that my friend was in agreement with that, but it turns out he was not.

THE COURT: All right. So but whether you describe it as an acute problem or a chronic problem, you disagree with the statement?

A Correct.

MR. DOHM: Thank you.

Q And the chronic effects listed, Doctor, have an introductory paragraph,

"The major health and psychological effects of chronic heavy cannabis use, especially daily use over many years, remain uncertain."

Do you agree with that statement?

A The major health and psychological effects of chronic heavy cannabis use, especially daily use over many years, remain uncertain. I do not agree with that. I have stated my opinion that we have learned enough to have come to a judgment. I am very aware of the fact that potentially I could be proved wrong in the future, because science always has that possibility, but I think we're to the point that the major health and psychological effects of chronic cannabis use are not uncertain. By and large, there is no proof that there are important health consequences of chronic use.

Q Okay. Next line in that then continues,

"On the available evidence, the major probable adverse effects appear to be ..."

and the first listed is,

"respiratory diseases associated with smoking as a method of administration such as chronic bronchitis and the occurrence of histopathological changes that may be precursors to the development of malignancies."

A I am in essence in agreement with that statement. I have to make one brief proviso, which is an important one. In pulmonary medicine, the terms chronic bronchitis and emphysema are often used together and indeed they often occur together; however, their linking is not inevitable and it is not incorrect for Dr. Tashkin and others to say heavy cannabis smokers have repeated episodes of acute bronchitis with cough, phlegm production and wheezing and to some extent they develop a chronic bronchitis. Now, the chronic bronchitis secondary to tobacco smoking is essentially always associated with some destructive inflammation in the small airways leading to emphysema, but it appears quite likely that cannabis consumption can cause a chronic bronchitis irritation, cough, phlegm, without the occurrence of emphysema. Hall and Soloway (phonetic) may have been aware of that because they didn't use the term emphysema here, but I feel that I have to qualify it. Other than that qualification, I'm in agreement with this statement. There's a potential for malignancy because of precancerous changes reported to the cells and chronic bronchitis may occur in the heavy smoker.

Q What is the normal course of action for a medical man who sees precancerous changes in cells on a patient?

A It varies, but in this case the logical advice given would be for the individual to remove himself from the irritation causing those changes if that removal is possible.

Q The next chronic effect listed as a major probable adverse effect is development of a cannabis dependent syndrome characterized by an inability to abstain from or to control cannabis use; do you agree or disagree with that?

A I believe that some individuals may fall into a pattern of use which we identify with the language that Hall and Soloway and Lemon have used here. I do not deny the possibility that some users of this psychoactive substance may misuse it, since that occurs with all psychoactive substances. It was simply my contention that this event is exceedingly rare.

Q You wouldn't agree with it being classified as a major probable adverse effect then?

A Thank you very much. I would not so classify it.

Q As we go through this, out of fairness to you, please remember that the words in that introductory portion—

A Mm hmm.

Q -- control what we're doing and we're talking about major probable adverse effects.

A Thank you.

THE COURT: You've got a way to go, I think.

MR. DOHM: Yes, and I think we all will need a meal before we complete it.

THE COURT: All right. I again have another judgment to deliver at 1:30, so I suggest we break until 1:45.

MR. DOHM: Thank you.

THE COURT: All right.

MR. DOHM: Oh, Your Honour, could you please caution Dr. Morgan in the usual way.

THE COURT: Dr. Morgan, you are now under cross examination. What that means is you're not to discuss your evidence or testimony or the questions that are being asked with anyone at all, including your lawyers.

A I understand.

(WITNESS ASIDE)

(PROCEEDINGS ADJOURNED)

(PROCEEDINGS RECONVENED)

MR. DOHM: Recalling the matter of Regina versus Caine, Your Honour.

THE COURT: Yes, thank you.

DR. JOHN PAUL MORGAN, recalled, testifies as follows:

CROSS EXAMINATION BY MR. DOHM continuing:

Q Doctor, when we broke we had just finished dealing with my question about the major probable adverse effect, including the development of a cannabis dependent syndrome.

A Yes, sir.

Q So the next major probable adverse chronic effect listed by the Hall report was subtle forms of cognitive impairment, most particularly of attention and memory, which persist while the user remains chronically intoxicated and may or may not be reversible after prolonged abstinence from cannabis. Do you agree with that statement or do you disagree with that?

A No, I disagree with the statement and I'm also confused as to what the author means by chronically intoxicated. He seems to mean a chronic user, but then he talks about after prolonged abstinence, but even chronic users are not chronically intoxicated, so I think it's badly written and I also think it's wrong.

Q Then—

THE COURT: Just hold on a moment.

MR. DOHM: I'm sorry, I—I didn't know whether there was a pause needed here or not, Your Honour.

Q Then we go on to the major possible adverse effects of chronic heavy cannabis use, which remain to be confirmed by further research, and they are listed, the first one in that category is an increased risk of developing cancers of the aerodigestive tract, i.e., the oral cavity, pharynx and esophagus. Do you tend to agree or to disagree with that proposition?

A I disagree. We did not discuss the fact in my previous testimony that there have been case reports in which individuals who were—who had these tumours were users of cannabis. In almost every instance they were also users of tobacco and alcohol and some quite predominantly so, so I object to even calling them possible effects. Even knowing that anything is possible, I'll take a stand and disagree with that one for sure.

Q Would you go so far then as to say that those effects that we just described in this last category are not possible?

A Oh, that's a good question. I do not believe they are impossible or not possible, but they are not as the language of Dr. Hall, are the major possible adverse effects. I do not agree that cancer of the head and neck should be listed thereunder.

Q Which is the modifier that causes you trouble, possible or major?

A Well, major. Again, we are—you and I are discussing this document and it has language which is not entirely clearly defined. The fact that something is reported in a case study, I saw a patient, I noticed that he was left-handed and he had rheumatoid arthritis, so maybe left-handedness causes rheumatoid arthritis; that's down. It's now—people are forced to discuss it. It is within the realm of possibility, because everything is possible, but I would not agree with it being listed as a possible consequence of being left-handed. So I do not believe increased risk of developing cancers should be—of these sort should be listed as the major possible adverse effects of chronic heavy cannabis use.

Q I'm not certain that I understood your answer—

A Mm hmm.

Q -- because my question was which was the modifier that troubled you, major or possible?

A Let me say major then. My believing that major means not—cancer, of course, is a major effect, but he's not using it that way. He's saying this is a predominant major effect of cannabis and then he attaches possible. Well, I can't entirely dismiss its possibility, it is not a major effect because it is—there's no evidence for it.

Q And to go back to our earlier discussion—

A Yes.

Q -- the writers of this report were competent scientists—

A Yes.

Q -- acting in good faith on what they considered to be evidence?

A Right. And I will comment further. The Hall and Soloway and Lemon document is an extremely valuable document. I have read it from cover to cover. You will find in my document that I've referred to it often. It is an encyclopediac listing of possibilities; however, my review is a critical review in which I looked at the evidence and made decisions about the probity of that evidence, while Hall and Soloway basically listed everything anyone had ever said, particularly in the last ten years.

Q All right. I'm not—so you understand, I'm not arguing that you're wrong or that they're right. I'm just trying to show the differences in the points of view.

A Right. And I understand. I have no objection to you showing the differences, but I think the document as written is as I described it, is an attempt to be comprehensive and encyclopediac and the authors have seldom taken a stand and that's my main source of agreement with what you're asking me to do—my main source of disagreement with what you're asking me to do now.

Q The next major possible adverse effect of chronic heavy cannabis use listed is an increased risk of leukemia among offspring exposed while in utero, and you dealt with that yesterday if I recall correctly.

A Yes, sir.

Q And if I understood your answer correctly, you would disagree with that?

A Yes, sir. I even used—went so far as to use the word that this was a useless study and this raises once again, I'm sorry to be perhaps more wordy than you wish for me to be, but someone does a study and claims that the offspring of cannabis users have an increased risk of leukemia. I believe any competent scientist reading that study would raise the questions I did and in fact the questions raised are so important that the study is wrong. It is wrong methodologically and although I cannot oblate it from the medical literature because it's already published, it should not be listed as any consequence of cannabis because it's wrong.

Q Which study was that, please?

A The author was Robison and it referred to an increased prevalence of acute non-lymphoblastic leukemia in the offspring of mothers who smoked marihuana during pregnancy.

Q Thank you. Then we have the next major possible adverse effect of chronic heavy cannabis use, which remains to be confirmed by further research as being a decline in occupational performance marked by under-achievement in adults and occupations requiring high level cognitive skills and impaired educational attainment in adolescents. If I recall your evidence from yesterday correctly, you disagreed with that?

A Yes, sir. I disagree with it. It's not only that there needs to be further evidence. There needs to be the first bit of acceptable evidence. I don't think there is any.

Q And then the next item listed under that category is birth defects occurring among children of women who used cannabis during their pregnancies, and do you agree or disagree with that?

A I disagree.

Q Thank you. Overleaf we get into high risk groups and you already identified them quite handily today as being for pregnant people, adolescents, those with predispositions to emotional or mental illnesses—

A Yes, sir.

Q -- and drivers, I think it was.

A Those—that's correct.

THE COURT: Could we just go back to page 9 for one moment? I'm sure you gentlemen are more familiar with the full report than I am at this point. The statement,

"The following are the major possible adverse effects of chronic use which remain to be confirmed by further research."

Do you know if that statement is explained anywhere? I'm having some trouble with it.

MR. DOHM: I can't—I couldn't take you to that directly, but we can look for it.

THE COURT: I'm just—all right. When one says that there's a possible effect that remains to be confirmed, I don't know what possible means any more.

MR. DOHM:

Q Let's just change topic a little bit, please, Doctor. The Addiction Research Foundation World Health Organization report has been described as a consensus report, does that term consensus report have any meaning to you?

A Yes, sir.

Q Is that a well-understood term within the scientific community?

A I think so.

Q And my understanding of a consensus report is that it's one that basically takes the results of something like a symposium and prepares an edited summary and then circulates the summary to those who participated to ensure that you have a consensus among all as to the results to be published.

A That's often done.

Q And—

A I don't know for sure if it was done with this document, since I wasn't a participant, but it's often done.

Q But was my description an accurate one?

A Yes, sir.

Q You're not certain as to whether that particular document was a consensus report or not, the ARFWHO?

A I do not know if it was circulated for approval to all participants, but I raise that because it's true, I don't know, but it was described as a consensus report and that may well have occurred.

Q As opposed to, for example, the Hall report that was not a consensus report but was a report commissioned by the government of Australia.

A That's correct, and the responsibility lies chiefly with the three individuals who wrote it.

Q In both cases, is it not fair to say that major portions of their conclusions were based on published articles which had appeared before the symposium or for the symposium?

A Yes.

Q A good many of those articles would in your experience, I take it, be peer review publications?

A Many were.

Q I have an odd way sometimes of preparing for cross examination which consists of many little pieces of paper.

A I don't mind.

MR. CONROY: Could I clarify that last question and answer? Were you talking about Hall there or the ARF?

MR. DOHM: Both.

MR. CONROY: Both of them.

MR. DOHM: The question was directed to both and I think the doctor understood it to be directed to both.

A Yes, sir.

MR. DOHM: Thank you.

MR. CONROY: Thank you.

MR. DOHM:

Q Just for a minute go to the health aspects of the Netherlands situation. I'd like to know if you are aware what the rates of use were for cannabis in the Netherlands before they went on your experiment in 1976?

A I do not know.

Q Okay. And do you know what the rates were during the early part and the—of that experiment, if I can call it that, in comparison to other European countries?

A I do not know and I doubt if anyone knows. The kind of survey document that's become popular in Europe and the United States were not in place in those days and I don't know the prevalence of use in the Netherlands, nor do I know it in France or Belgium or Germany.

Q Would it be fair to say then that it's most difficult to conclude that the rates have dropped since the commencement of the experiment?

A I would not conclude that they have dropped and there's almost no way of knowing, as you've said.

Q Some of these are blank. There's not that many questions. Yesterday in the course of your evidence, you discussed the study done by Dr. Soloway on effects on the brain. Just trying to get to the right place in my notes. And you were dealing with Chapter 11 in your book—

A Yes.

Q -- in your new book, which has a title which includes the term brain damage study, but that might be a term that is not as sophisticated as a person in your profession would use.

A In part because the book was written to be read by non-specialists.

Q When you are using that term were you—I wasn't being critical. I was just trying to find the correct term. Would it be cognitive dysfunction or—

A In fact, we first placed Dr. Soloway's studies in the chapter called Intellectual or Cognitive Dysfunction, but later we made the decision, because it dealt with a structural reflection, that is an electrocardiogram that we would place it in the brain damage chapter. There are others who would do it the other way. We shifted it into the brain damage because of the EEG character of the measure.

Q The location doesn't make any difference to me where you put it, but do you know whether or not Dr. Soloway's report of her experiment was published in a peer reviewed journal?

A It was published in two places. It was published in a proceedings of the International Association of Cannabis Research, which is not peer reviewed, but it was also published in a peer reviewed journal, at least twice. She's published two—two, maybe even three papers on this phenomena and two or three are in peer reviewed journals.

Q In the ordinary course of events then one would expect that Dr. Soloway's work had gone through that circulation system that we described earlier?

A Yes, sir.

Q And the next thing that you told us was that Dr. Gloria Patrick had performed two studies in an effort to replicate the findings of Dr. Soloway. I have that right, I think?

A Yes, sir.

Q The first study done by Dr. Patrick was able to replicate the results that Dr. Soloway arrived at.

A To some degree, that's correct. She seconded or replicated Dr. Soloway's claim that there were abnormalities in the P-300 form, the event related potential in some chronic users of cannabis, so Dr. Patrick's first study would be counted as seconding or replicating Dr. Soloway's.

Q And then Dr.—oh, was Dr. Patrick's first study published in peer reviewed journals to your knowledge?

A It is my belief that it was. I might take a look to make myself—

Q Certainly.

A -- completely—sure you don't mind?

Q Oh, no. I'm more interested in getting the right answer than a quick one.

A It would be on page 148 in Hall and Soloway—I'm going to have to leave it because Hall and Soloway refer to neither of the Patrick papers, I don't believe, at least in that section I looked at.

Q But you're familiar with Dr. Patrick's work, though independently of Hall and Soloway?

A Correct. In fact, the journal it's published in is a journal called Life Science.

Q Is that a journal that would ordinarily expect its publications to be peer reviewed?

A Yes, sir.

Q So the odds are then that Dr. Patrick's first study and her second study were—

A In fact I—

Q -- peer reviewed?

A -- I'm confused a little bit. The second study published in Life Science was without question peer reviewed. I'm still a little uncertain as to where the first Patrick study was published. I suspect strongly that it was peer reviewed, but I cannot remember where it appeared.

Q And you gave two assessments then yesterday in your evidence of Dr. Soloway's work and one was she's wrong and the other was it hangs in abeyance.

A Did I say both those things?

Q Unless my note-taking is becoming very creative.

A Okay. You'd like me to comment today on that?

Q Which would be the more fair assessment?

A It hangs in abeyance would be more fair.

THE COURT: What hangs in abeyance?

A The—whether Dr. Soloway is correct in that chronic users have this altered event-related potential.

THE COURT: So the issue—

A Say again?

THE COURT: That issue hangs in abeyance.

A Yes, whether she's right or wrong hangs in abeyance. She says I'm right, someone else has published a paper that says you're wrong, so we currently are unresolved. Okay?

THE COURT: Yes.

MR. DOHM:

Q Or one could say someone else has published two papers, one of which says you're right and one of which says you're wrong?

A Absolutely.

Q Okay. The next one that I'd like to deal with is—let's go back to Dr. Soloway's paper for a minute. Have you done any public criticism of Dr. Soloway's paper in the scientific sense?

A No. Our first commentary is this document which is not yet published. We published an earlier document about exposing marihuana myths, but we did not, in that document, comment on Dr. Soloway's work.

Q And this document that we're referring to is the twenty chapter book that has been marked as an exhibit in these proceedings?

A Yes, sir.

Q Exhibit 27. And that will be published quite soon, I understand?

A Yes, sir.

Q Is that document peer reviewed?

A It is peer reviewed. We have sent it to twenty-five scientists, many of whom were quoted here, and asked them for their commentary and commitment to our—or disagreement with us. Now, I say peer reviewed because that's certainly peer reviewed. It's not exactly the way a journal would do it.

Q It's not peer reviewed in the sense that we've discussed earlier then?

A That's correct. I sent it to many of the people I criticized and asked for their comments.

Q The next item I'd like to address is your Chapter 12, which dealt with intellectual functioning and you mentioned a study by Pope—

A Yes, sir.

Q -- who published in the Journal of American Medical Association a paper which tended to show, and this is from my notes, so you feel free to correct me on this, there is a cognitive impact in chronic marihuana users.

A That's correct.

Q That's correct? Now, the Journal of the American Medical Association, is that a peer reviewed type of journal?

A Yes, sir.

Q So we can assume that Pope's paper on that would be peer reviewed?

A Yes, sir, it was.

Q And your response to Pope again is found in Marihuana Miss Marihuana Facts?

A Yes, sir.

Q In the same part of your evidence yesterday, you spoke about a Professor or Dr. Block, I say Professor or Doctor because I don't know which it is or should be, who had published results similar to what Pope had published on cognitive impact in chronic cannabis users.

A That's correct.

Q Which paper was that, do you recall?

A Dr. Block's paper—I'll actually just give you the exact title if you would like, was by Block and Ghoneim, G-h-o-n-e-i-m, and it is entitled Effects of Chronic Marihuana Use on Human Cognition, paper published in 1993.

Q And that again, one would be inclined to ask did that appear in a peer reviewed journal?

A Yes, sir. It appeared in a journal called Psychopharmacology which is a peer reviewed journal.

Q That's the one where you took some serious issue with his analysis and reporting sequence?

A That's right. I was critical of him. He had published an earlier version of the paper and then published a recalculated version without referring to the earlier publication. I also criticized him because he had no proof that individuals had restrained themselves from cannabis use immediately before doing the testing.

Q And your criticism again appears in the same publication, Marihuana Miss Marihuana Facts?

A Yes, sir. I'll mention, I hope not gratuitously, that Professor Zimmer and I have prepared three of these chapters for submission to peer reviewed journals and when I return to New York City, we shall mail them out, look at the final version and mail them out.

Q Very well. That's step 1 in the peer review process.

A Yes, it is.

Q When I think of a clinical pharmacologist, I think of a doctor who spends a lot of time treating people from the bad effects of mixing up drugs, is that a fair assessment?

A Well, no. I think that's probably a minority of the work of clinical pharmacologists, although some do that. They spend a fair amount of time caring for patients who have undergone toxic effects of drugs. Probably most clinical pharmacologists spend their time in evaluating drugs for therapeutic effects in small studies funded by the pharmaceutical industry.

Q They would share then with the—that I have just described, a concern over the interaction of drugs?

A Yes.

Q Now, that's a very key area of interest for pharmacologists generally, is it not?

A Yes, sir.

Q Just bear with me while I hunt here. If I can direct your attention please to your evidence this morning about the Robbe report, R-o-b-b-e—

A Yes, sir.

Q Robbe. I understood one of the things that you said to be in essence that one person, one scientist criticized that report because as far as that scientist was concerned the doses were too low.

A That's correct. He particularly criticized the urban driving portion of Robbe's experiment which indeed employed the smallest of the three doses.

Q That was the one hundred microgram dose.

A One hundred microgram per kilogram, yes, sir.

Q Did the report not itself express some concern in its conclusion as over the dose levels?

A Yes, Dr. Robbe discussed the fact that he had for reasons of public safety felt that he should use the smallest dose for the urban driving experiment but then he also discussed why he had confidence in it, the evidence that individuals were under the influence of marihuana but yes, he did discuss that.

Q Much of what is going to control how much a cannabis user will use will be that individual's subjective assessment of the quality of the high that the user is receiving?

A Yes, sir.

Q You smoke enough until you get where you want and then you stop, if I've understood you correctly.

A Often that's true.

Q Okay. In their report, and I'll show it to you in a moment, at the summary of conclusions, page 178, the first conclusion listed was that,

"Current users of marihuana prefer THC doses of about three hundred microgram per kilogram to achieve their desired high."

Let me just show that to you and make sure I've got it correctly.

A Yes, sir. That's exactly what he says.

Q That's right?

A Mm hmm. By current users, he's referring to the people that he entered into this study.

Q Yes.

A And he was surprised that many of them wished that much marihuana, but it was true, that's what they wished.

Q Did he select a group of marihuana users with unusually great capacities for marihuana?

A Not that I'm aware of. He did—counted on the fact that the three hundred microgram per kilogram dose was larger than that used in most published experiments of the assessment of marihuana on driving. Most of them have not used that much and so then he did express the finding that this group of smokers and Mostrict (phonetic) in the Netherlands preferred to smoke three hundred micrograms per kilogram.

Q I'd like to address now Chapter 16 in your book.

A Yes, sir.

Q You don't—you have a copy of this, don't you?

A Yes, I do.

Q Under the fact portion of your book, on the first page of Chapter 16, not numbered, the introductory sentence is,

"There is no convincing evidence that marihuana contributes substantially to traffic accidents and fatalities."

Now, you have said that and then you have discussed the available information to you throughout the next number of pages, including—and you conclude generally that there's a very wide margin of safety for cannabis

users, but you have also said that you do not recommend that people drive cars while they are intoxicated by cannabis.

A Yes, sir.

Q Now, your recommendation is something more than just common sense because you're writing a scientific paper here.

A I hope so.

Q So you have an evidentiary basis for advising people not to drive while under the influence of cannabis, correct?

A Yes, sir. Evidentiary basis may not be the word that I would ordinarily have used, but I can, if you wish—

Q Well, use your word.

A Okay.

Q You know, forgive me. I'm a lawyer.

A Right.

Q Evidence is something that I use as a word. You're not tied to my word.

A Okay. I was going to read it to you, but why don't I just say to you to save time in discussion of all the published papers, both the studies showing that alcohol impairs driving to some degree and marihuana appears to impair driving to a very little degree, Professor Zimmer and I were influence by other people who have written about this, particularly Professor Cheshire from Australia and in conversations with him he basically said none of the studies that we have performed heretofore, driver simulator studies, actual on road tests, the sort of things that we've been discussing, none of those tests can measure the ability of the driver to respond to emergent sudden conditions, and I think that's—first of all, I believe that to be very much true and therefore I think that's the principal reason for the prudent statement that I don't think people should drive under the influence of any intoxicating substance. I'm struck by the fact that marihuana appears to impair usual driving ability hardly at all, but none of the tests that we have performed have evaluated people's ability to respond to emergencies, so my advice is don't drive an automobile while taking a substance.

Q Is it fair to say then that there is no convincing evidence, but you are taking the conservative course on this point?

A Surely.

Q In the course of your discussions of this topic, marihuana's influence on driving ability, you mentioned that in many of the cases where they found the presence of THC, they also found the presence of alcohol.

A Yes, sir.

Q And as a pharmacologist, would you be concerned about the interaction of those two drugs?

A I would.

Q And is that because there is an additive effect?

A The literature is conflicting. If you ask for my interpretation of the literature, I would say I believe there is an additive effect.

Q And for the—an additive effect with drugs is what? Would you just put that on the record for us?

A One dose of alcohol plus one dose of marihuana equals two doses of drug, or four doses of alcohol plus four doses of marihuana equals eight doses of drug, so that if all of those have a potential to impair, so the more one stacks, the more likelihood one is to have an impairing effect.

Q Okay. On that basis then, would it not be quite possible to find a person driving a vehicle with a blood alcohol level which you, as a doctor let alone as a pharmacologist could measure and calculate, that would be much less than the legal limit, but you would have perhaps because of the additive effect of another drug such as THC, a level of impairment unmeasurable but in excess of what any breathalyzer would show?

A I agree with your description.

Q Thank you. Now, just before we left the Hall report, Dr. Morgan, Her Honour asked a question as to what standards were used to come to such terms as a major possible adverse effects, things like that.

A Yes, I remember.

Q You recall that? Are you able to answer the question that Her Honour asked?

A No.

Q You're not?

MR. DOHM: I will leave that then, that particular question, for Dr. Kalant, and failing that, we'll point it to you—point you to it in argument.

THE COURT: All right.

MR. DOHM:

Q Aside from what your curriculum vitae shows, which is -- I have to ask you whether you are also on the board of the National Organization for the Reform of Marihuana Laws?

A Yes, I certainly am. Is it not listed in my curriculum vitae?

Q I didn't see that in there. Okay.

A I certainly am.

Q And are you also on the board of the Greater Cincinnati chapter of Americans for Compassionate Use?

A Yes, I am, although I'm not sure they exist any longer, but that was a cannabis buyers' club and I served on their—

Q That's also known, I take it, in the vernacular as the Cincinnati Cannabis Buyers' Club?

A That's correct.

Q I understand that the National Organization for the Reform of Marihuana Laws is an organization that does not promote civil disobedience, is that correct?

A I think that's correct. It does not promote civil disobedience.

Q And what does a—if I can use the vernacular—Cincinnati Cannabis Buyers' Club, what did it do? What was its purpose?

A Oh, its purpose was to supply cannabis to individuals who presented to them with a note from a physician indicating that the bearer could benefit from the medicinal applications of marihuana, so the young man who organized the Cannabis Buyers' Club obtained marihuana and provided it to individuals with this documentation and he asked me to serve on his board in part because my home was Cincinnati and I visited there often. He came to know me and asked me to do this for him.

Q And he—it would be fair to describe you, you may well describe yourself as an activist who promotes the cause of changing the laws relating to cannabis?

A That's—that's fair. I became interested in cannabis initially as a scientist and physician. My first interest in cannabis really was in its medical application, but over the years as a student of cannabis and other psychoactive drugs, I have decided that the drug policy followed by the United States is a mistake, so I have become what you have described, someone willing to speak out against that policy in a variety of settings.

MR. DOHM: Those are my questions for Dr. Morgan. Thank you, Doctor.

A Thank you, sir.

MR. CONROY: Just a few—

RE-EXAMINATION BY MR. CONROY:

Q The Cincinnati Cannabis Buyers' Club, are you on the actual board of directors or is it an advisory board?

A I believe it's only structured as a board of directors, although once I agreed with Mr. Evans to join that board, I never communicated with him about the policies of the buyers' club again and it no longer exists, but it was, I believe, a board of directors.

Q And as I understand it from all of the evidence we've heard, it's only recently California and Arizona that have had these initiatives in terms of therapeutic use of marihuana, these resolutions—

A Yeah, the two voters' initiatives that were passed occurred in November. The phenomenon of the Cannabis Buyers' Club is a little bit older—

Q Yes.

A -- in the United States. There are probably thirty of them now in which individuals set up an organization to deliver medicinal cannabis.

Q The point that interested me, as you said, it supplied cannabis to those with a note from a physician saying—

A Yes.

Q -- they could benefit. Is that like a prescription then?

A Well—

Q Of sorts.

A It's analogous, I guess, to a prescription. One cannot prescribe marihuana because there are no standard legal drug store versions, so what most of the cannabis buyers' clubs have done is to require some documentation of a physician's sponsorship that this individual will benefit from the use of medicinal marihuana and then the buyers' club will attempt to supply marihuana to such individuals.

Q There's no source of supply for the loosely termed prescription?

A Correct.

Q But is there in the United States a power on the part of the physician to write the prescription, even though it can't be filled?

A Well—

Q As far as you know?

A The power is, of course, an informal one. The buyers' club said we will try to give cannabis to individuals who can provide some proof that a physician thinks they can benefit from it, so the prescription is—the physician's note is an unofficial document, except now in the states of California and Arizona, where it becomes an official document. It means that individuals will be immune from prosecution for the possession of cannabis if they possess such a note.

Q See, what I'd like to know—

A Mm hmm.

Q -- if you don't know, just tell me, but in Canada under Section 53 of our Narcotic Control Act Regulations, it's provided that a practitioner may administer, prescribe, give, sell or furnish a narcotic and marihuana is included in our legal definition of—

A Ah.

Q -- narcotic, to a person or animal if the person or animal is a patient under his professional treatment and the narcotic is required for the condition for which the person or animal is receiving treatment. So do you know if that comparable power exists in the United States—

A It does not.

Q -- for a physician?

A It does not exist.

Q Okay. And these resolutions that you've talked about, do they have that effect or not?

A I think they do.

Q Okay.

A In Arizona, they certainly do because the Arizona statute includes all schedule 1 drugs which is the wide panoply of illegal drugs in the United States—

Q Okay.

A -- while—although the California proposition only included marihuana.

MR. CONROY: I have—I'm going to be including that section in an actual binder that gives you the full Narcotic Control Regulations, but I see we have a—what I would call an Internet version of that regulation, so—sorry, I'm told it's a Quick Law version of the regulation.

THE COURT: Are there any qualifications to that? I mean, does this mean that a physician in Canada can prescribe—

MR. CONROY: Yes, and has since—

THE COURT: -- marihuana for therapeutic purposes?

MR. CONROY: That's right.

THE COURT: I didn't know that.

MR. CONROY: Yes. That's the law, subject to—but the problem as I understand it is as the doctor has said—

THE COURT: Where do you get it from.

> MR. CONROY: -- where do you get it from. And the problems of going through the bureaucracy to get approval to get it are somewhat substantial, I understand, and not just for marihuana, but any narcotics.
>
> Q So that law that I've just read to you would obviate the necessity for us to have one of these initiatives such as California or Arizona.
>
> A I think so.
>
> MR. DOHM: Excuse me, Doctor. This is redirect examination, Your Honour, and I didn't get into that law at all and I didn't get into California or Arizona, so with respect, I think my learned friend is going beyond what he should.
>
> MR. CONROY: I'll try to bring it back to Cincinnati, which is what I intended to do, but I wanted to explore whether the—in Cincinnati, this giving a note, whether a law existed for that, as in Canada, or not.

THE COURT: Well, let's deal with Cincinnati, then.

MR. CONROY:

> Q Do you know, Doctor if—what the situation is in Cincinnati in terms of giving a note, whether there's any similar provision?
>
> A There is not a similar provision. The provision of the note was relied upon by Mr. Evans in the Cannabis Buyers' Club as an expression of validity and an expression of his decision to supply marihuana only to medically needy persons, but he had no protection under the law and the physicians signing such a note, which I've often done in the United States in various jurisdictions is an unofficial act. As you may know, the Court may know, General McAffery threatened to

prosecute or to remove the federal license of physicians who signed such a note. It's unclear if he will do so or if he will be able to do so, but no, there is no provision outside—

Q This was a statement of—McAffery is the new—

A The new—

Q -- drug czar?

A -- director of the Office of National Drug Control Policy.

Q And this was a statement after these—

A After these initiatives passed.

Q -- resolutions—

A An attempt to dissuade physicians from doing this, even though the state law now said they could.

Q But I take it there's nothing wrong, unlawful about writing a note saying you think a patient needs it. There's no law that says you can't do that, or is there?

A That's correct.

Q Okay.

A All current—currently there are arguments coursing back and forth around the United States. I think General McAffery's threat is an empty threat, but it has been made.

Q Okay. The board of NORML, is that an actual board of directors or is that an advisory board?

A No, in this case that's the actual board of directors. I'm fond of telling people that Dr. Lester Grinspoon called me up and ordered me to join the board of NORML and I was powerless to resist, so I have been on the board for approximately two years.

Q Okay. The question arising out of the Hall report, I want to see if I understand exactly what my friend was getting at there and the Court was getting at, but it's the one—I stand to be corrected by anybody, because I take it it's the last part of the executive summary, dealing with major possible adverse effects of chronic heavy cannabis use.

A Yes.

Q Is that your understanding?

A That's what we were, in discussion—

Q Now, chronic heavy cannabis use means what?

A Under the definition—

MR. DOHM: That's not the question that was—that Your Honour asked. Your Honour asked what Hall and Soloway meant by that.

MR. CONROY: Oh, I see. Okay.

Q And that you don't know?

A Correct.

Q Okay. My friend read to you a line from Robbe and then he read to you from your Chapter 16 and am I correct—my understanding of my friend's question was he was putting this to you in terms of the effect of marihuana on people's driving, but as I read your line in Chapter 16, is it limited to that or does it go further?

A I'm confused.

Q All right. I thought that my friend's question was with respect to the dosage, first of all, when he read to you from Robbe, and the effect of consuming marihuana and then driving—

A Yes, sir.

Q -- how that affected driving and then he read to you your statement. As I read your statement, it seems to talk about accidents and fatalities.

A Mm hmm.

Q In terms of the no convincing evidence.

A Oh, I see. Yes. I added in the evidence from four to five kinds of assessments as to whether marihuana use constituted or contributes substantially to traffic accidents and fatalities and I talk about the epidemiological data, the actual driving studies, the simulator studies and all of those led me to make the

statement that I've made here a number of times now and wrote in the chapter. Did I understand you correctly?

Q Yes.

A Thank you.

Q The peer review business.

A Yes.

Q My friend asked you a lot about that. You said that you submitted three chapters to peer review journals.

A We have prepared three chapters for submission from this document.

Q Three of the chapters. Can you tell us which ones?

A Yes. The first one to be submitted is the chapter on potency, the second one to be submitted is the chapter on medical marihuana and the third one to be submitted is chapter on the immune system.

Q Okay.

A We've got those three in their current state could or with slight modification could stand up to peer review.

Q Now, I'm not sure if I understood completely the process that my friend put to you because you talked about a slightly different peer review in saying how you'd sent your work out—

A Yes.

Q -- to twenty-five scientists, but my understanding was and—that to get the article published, you publish it in a journal that your peers commonly read or use and then they send criticisms back or is it only once -- it has to be approved by your peers before it gets into the journal?

A That's correct.

Q Okay.

A It's the latter. The journal editor receives the article and he or she then decides from his panel of reviewers, individuals who have reviewed for him or her in the past

who are thought to be expert in this particular area. Then the editor will send the article to them, usually for an anonymous commentary. It's not always done anonymously, but traditionally it has been, and then the editor still bears final responsibility, but he or she now has this review from other people involved in the field, and that's the process that's a sort of formal peer review that many journals use.

Q Okay. And then finally, when this—the Hall report term adverse effect was read to you from that summary, what meaning were you giving to the term adverse effect? Is it the same as what we saw in the ARFWHO report or was it—or is it different?

A Oh, no, I think it's the same.

Q Okay.

A We had discussed the fact that a biological consequence evaluated by scientists would be called an adverse effect, even though the marihuana user might not call it an adverse effect.

Q But the definition I think we used from ARF this morning was when such use produces impairment of an individual's biological, behavioural or social function.

A Yes.

Q Yes. I think that—I'm not sure we understood your answer to my friend in relation to this—the Soloway and Block—first there was the Pope study and then there was the Block study.

A Mm hmm.

Q And there was this discussion about the issue hanging in the balance.

A Actually, my memory is the hanging in the balance was the Soloway contention.

Q Yes.

A And that Gloria Patrick and her colleagues at Telane (phonetic) had published a paper which is actually in many ways the refutation of the Soloway contention, and then your friend asked me if I had—if I—I had said to—I had directed my language in two ways, one to say that Soloway was wrong and the second was a more

formal and polite that the results hang in abeyance, in other words it will await further study. Actually, I believe both to be true. I think Soloway was wrong but it hangs in abeyance. Others will try to repeat these studies and we'll have a resolution as to whether chronic marihuana users have been—altered event-related potential response.

Q So let me see if I understood that fully. First there's the Soloway report.

A Correct.

Q Then along comes Patrick.

A Correct.

Q There's one report that does tend to replicate Soloway—

A Yes.

Q -- to some degree and then there's another report which doesn't and that's why it hangs, the issue—well, that's why you say what you said.

A In part, that's why the issue hangs in abeyance. If I may, in a certain sense Patrick's second report, the report in Life Science which says medically and psychiatrically normal chronic marihuana users do not have the altered ERP, she in a sense is commenting on both Soloway's studies and her, Patrick's earlier studies.

MR. DOHM: That was covered in chief yesterday, Your Honour.

THE COURT: I recall the evidence.

A Okay.

MR. CONROY: Thank you. That's all.

A Thank you.

THE COURT: That's it. You're excused.

A Thank you very much.

THE COURT: Thank you very much, sir.

(WITNESS EXCUSED)

MR. CONROY: That's all the evidence that we'll be calling, Your Honour, on behalf of the applicant. We do have yet to give you some more materials before sort of formally closing our case but of course my friend has a witness, I think, that we can proceed with. I want to make sure and I hope we can do this maybe tomorrow, that you've got each book that we have in the Brandeis brief. We have copies of and that sort of thing, and just make sure you've got everything that you're supposed to have in the files of paper, but that's essentially all we have left to do.

THE COURT: All right.

MR. CONROY: I do have some legislation, a book of legislation for you and I think just making sure you've got the books and then making sure you get the French translations of the—or the English translations of the French in Hamon before you come to make a decision.

THE COURT: Well, we'll take the afternoon break before we—

MR. DOHM: Yes, Your Honour, and maybe just before we break there's two or three things. Upon return, I propose to give you a brief opening so you'll have some idea where I'm going or where I plan to go and then we will proceed with Dr. Kalant and it's getting towards the end of the afternoon on Wednesday. I cannot reasonably foresee Dr. Kalant being finished his evidence in chief much before noon tomorrow. There will be some cross examination, and I am thinking that we should perhaps consider whether or not it would be a useful thing to start argument on Friday or whether Your Honour could be better occupied while Mr. Conroy and I try to abbreviate our arguments.

THE COURT: I will make this proposal to both of you. If I were to receive your written arguments or your summaries of the facts and how you're relating it to the legal arguments in advance and I was given some time to digest those arguments and go back to the original materials and then have counsel return for oral argument at a point in time when I had some fairly clear-cut questions myself, that that might be more productive because I could anticipate listening to legal argument now, going away, looking at all the materials and having a hundred questions that I wanted you to come back for.

MR. DOHM: I'm content, and I—to conduct it that way.

THE COURT: All right. Well, I would propose then that we complete the evidence, I'll await delivery of written submissions and we'll set a date far enough in the future that will give me the time to go through those submissions, get a—

MR. DOHM: Very well.

THE COURT: -- grip on them and the materials, all of the evidence is in front of me and we'll come back and deal with oral argument at that time.

MR. DOHM: Okay. Thank you.

(PROCEEDINGS ADJOURNED)

(PROCEEDINGS RECONVENED)

MR. DOHM: Your Honour, if I could I hope briefly just let you know where the Crown is going on this. I understand the applicant's application to be and I'm paraphrasing it a bit that Parliament cannot legislate to prohibit conduct unless Parliament can demonstrate harm flowing from that conduct, and I do think that Mr. Conroy had in his application the words to others or to society as a whole.

> We, in the response, and it's important to remember that that proposition that I just enunciated is posed to you as a principle of fundamental justice within the meaning of Section 7 of the Charter. The Crown is approaching this case on the basis that that is an incorrect statement of principle, that in fact a demonstration of harm is not necessary and that in areas where there is a divergence of opinion by those who have an interest, it is the role of Parliament to decide which policy should apply and that save for the cases— for the instance where that legislation violates a principle of the Charter, the courts do not have a role and that is often expressed in the terms that it is not for the courts to second-guess the wisdom of an enactment.
>
> So the Crown is going to be taking the position we have here, a division of opinion and the deciding role is for Parliament as opposed to the courts. So having heard from a number of witnesses on behalf of the applicant, the Crown will call Dr. Harold Kalant to provide you with the counter view to what you have heard so far, and that that is what Dr. Kalant is being called for in essence, although his evidence may become fairly detailed and fairly scientific, but he's going to show you that there is indeed another respected body of opinion which differs from that tendered by the applicant.
>
> Dr. Kalant, please.
>
> DR. HAROLD KALANT, a witness, being duly sworn, testifies as follows:
>
> THE CLERK: Please state your name and spell your last name for the record.
>
> A Harold Kalant, K-a-l-a-n-t.

THE COURT: You may have a seat, sir.

MR. DOHM: Dr. Kalant is being tendered as a person whose qualifications and experience should permit him to provide Your Honour with opinions in the fields of health and of psychopharmacology. I understand from my learned friend that there will be no issue on his qualifications.

MR. CONROY: That's correct. When my friend says health, I assume he's talking in the same vein as Dr. Morgan as a medical doctor.

MR. DOHM: Exactly, thank you.

MR. CONROY: Is he going further into psychiatric consequences or not?

MR. DOHM: Only to the extent that that would be consistent with his experience and qualifications in psychopharmacology.

MR. CONROY: I accept that.

THE COURT: All right. Based on the positions of counsel then, I will qualify this witness to give opinions in the field of health and psychopharmacology.

MR. DOHM: I'm going to lead Dr. Kalant through his curriculum vitae for some time here and I have a copy for him to refer to. Do you need a copy, Doctor?

A It probably would be helpful.

MR. DOHM: And I have one, I can save Your Honour some note- taking too. Do you have any objection to marking that as an exhibit now?

MR. CONROY: Not at all.

MR. DOHM: Could we please—

THE COURT: All right. That will be the next exhibit.

THE CLERK: 28, Your Honour.

EXHIBIT 28 - CURRICULUM VITAE OF DR. KALANT

EXAMINATION IN CHIEF BY MR. DOHM:

Q Doctor, you live in Toronto, Ottawa, and have—Toronto, Ontario—

A Ontario.

Q Oh, my gosh.

MR. CONROY: That's what happens when you work for the Department of Justice.

MR. DOHM: I see. You might be right.

Q And you are married to Oreana Jocule Kalant?

A That's correct.

Q And I mention that because O.J. Kalant appears as a co-author with you in some of your publications?

A That's correct.

Q And that's your wife?

A Yes.

Q You received a medical degree from the University of Toronto in 1945?

A That's correct.

Q Before that—or after that, you received a Bachelor of Science in Medicine at Toronto in 1948?

A Correct.

Q And you received a Ph.D. in pathological chemistry at Toronto in 1955?

A Correct.

Q You did a post-doctoral fellowship in biochemistry at the University of Cambridge, England, from 1955 to 1956?

A Correct.

Q You had served in the Royal Canadian Army Medical Corp from 1943 to 1947?

A Right.

Q As post-graduate medical training, you studied internal medicine with three years residency at the hospitals Saskatoon Veterans' Hospital for six months, Toronto General Hospital for one year and the Hospital Dal Salvadore in Santiago, Chile, for eighteen months?

A That's correct.

Q You have been a part-time attending physician at the Bell Clinic for Alcohol Problems in Toronto from 1952 to 1955?

A Correct.

Q You are currently a professor emeritus at the Department of Pharmacology at the University of Toronto?

A That's correct.

Q And you are the director emeritus and have been since 1989 of biobehavioural research at the Addiction Research Foundation of Ontario?

A That's correct. The 1989 applies to both of those emeritus positions.

Q From 1956 to 1959 you were the biochemistry section head at the Defence Research Medical Laboratories in Toronto?

A Correct.

Q From 1959 to 1964 you were an associate professor at the Department of Pharmacology at the University of Toronto.

A Yes.

Q And the assistant research director, Alcoholism and Drug Addiction Research Foundation of Ontario, Toronto.

A Right.

Q From 1964 to 1989 you were a professor in the Department of Pharmacology at the University of Toronto?

A Correct.

Q From 1964 to 1979 you were the associate research director of biological studies for the Addiction Research Foundation.

A Right.

Q From 1979 to 1989 you were the director of biobehavioural research for the Addiction Research Foundation in Ontario?

A Correct.

Q Among the honours that you have gathered over your career are the Alpha-Omega-Alpha Honourary Medical Society in 1942, the Cody Silver Medal for Medicine in 1945 and what is the Cody Silver Medal for Medicine, Doctor?

A Oh, that's an award to the person who comes second in the graduating class in the Faculty of Medicine.

Q Okay. You also received the Star Medal for research in 1955?

A Correct.

Q The Jelenek Memorial Award for research on alcoholism jointly with R.A. Poppin at Amsterdam in 1972.

A Correct.

Q Is that a Canadian award or is it—

A No, the Jelenek award is international.

Q It's international?

A You received the Raleigh Hills Foundation International Gold Medal Award for excellence in research on alcoholism in 1981?

A Correct.

Q You became a fellow in the Royal Society of Canada in 1981 and what is the Royal Society of Canada?

A The Royal—excuse me, the Royal Society of Canada is a society that was created in the 19th century by the Governor-General at that time for the promotion of arts

and sciences and it has three academies, an English language academy and a French language academy in the arts and a joint academy in the sciences. The academy of sciences has separate divisions for the life sciences, for physics and mathematics, chemistry, engineering, environmental or planetary sciences and agriculture, botany. It—membership is by election usually—well, there's a limited number of members who are elected each year and a certain number of new members are allocated to each of the academies, so that the membership is in a sense recognition of one's work by one's peers.

Q Thank you. You received the 4th Annual Research Award for the Research Society on Alcoholism of the United States of America in 1983?

A That's correct.

Q You received the Upjohn Award for the Pharmacological Society of Canada in 1985?

A Correct.

Q And you received the Nathan B. Eddy Award for the Committee on Problems of Drug Dependence in 1986?

A May I perhaps just change one word. It's not for but from all of these various organizations.

Q From them.

A Right.

Q Thank you. You are the president-elect of the International Society for Biomedical Research on Alcoholism in 1989?

A Yes.

Q In 1989 you were made an honourary fellow of the Society for the Study of Addiction in the United Kingdom?

A Correct.

Q You received in 1995 the Distinguished Scientist award from the American Society of Addiction Medicine?

A That's correct.

Q You're a member of a number of societies as well, including the Biochemical Society of the United Kingdom from 1956 to 1978?

A Correct.

Q The Pharmacological Society of Canada from 1965 to the present?

A Right.

Q The American Association for the Advancement of Science from 1968 to 1993?

A Correct.

Q The International Society for Biomedical Research on Alcoholism, you are a member of the founding committee in 1981?

A Right.

Q You were president of that organization from 1990 to 1994?

A Correct.

Q And the immediate past president since 1994?

A Yes.

Q You are a foreign corresponding member for the Societe de Biologe in France since 1993?

A Correct.

Q You're a member of a number of advisory bodies including the Scientific Advisory Board, North American Association of Alcoholism Programmes from 1961 to 1970?

A Right.

Q The same board but the International Council on Alcoholism and Addiction from 1972 to 1975?

A Correct.

Q You're a member of the Expert Panel on Drugs of Dependence for the World Health Organization at Geneva from 1978 to 1984?

A Correct.

Q You were on the Grant's Review Committee for the Non-Medical Use of Drugs Directorate from 1970 to 1972?

A Correct.

Q You were on the Grant's Review Committee for the National Institute on Alcoholism and Alcohol Abuse of the United States of America from 1970 to 1974?

A That's correct.

Q You're a member of the Scientific Advisory Board of the Addiction Research Foundation, Palo Alto, California from 1974 to 1977 and the chairman of that board from 1977 to 1982?

A Correct.

Q You were a member of the Banting Research Foundation from 1976 to 1980?

A Right.

Q You were also a member of the College on Problems of Drug Dependence in the United States of America from 1978 to now?

A Right.

Q The Committee Desante de Research for the Government of Quebec from 1983 to 1984?

A Right.

Q Chairman of the Board of Scientific Councillors for the N.I.A.A.A. from 1983 to 1988?

A Yes.

Q N.I.A.A.A. is a—

A National Institute on Alcoholism and Alcohol Abuse.

Q Thank you.

A Saves space to use the abbreviation.

Q You participated in the Canadian Centre on Substance Abuse at Ottawa, having been appointed to the first board by the Governor-General in Council between 1989 and 1993. You're a member of the Extramural Research Advisory Board for a National Institute of Drug Addiction, is it, in—

A Drug Abuse.

Q Drug Abuse and that's an American organization?

A Yes, that's American government organization.

Q 1990 to 1992?

A Right.

Q You have been an associate editor of the Canadian Journal of Physiology and Pharmacology—

A Yes.

Q -- from 1975 to 1981. You were the Pharmacology Field Editor for the Journal of Studies on Alcohol from 1983 to 1992. You've been a member of boards for the purposes of dealing with problems of alcohol, alcoholism, clinical and experimental research, biochemical pharmacology, drug and dependence and drug and alcohol dependence, electroencephalography and clinical neurophysiology, medical biology, neuroscience and behavioural reviews, pharmacology, biochemistry and behaviour, progress in neuropsychopharmacology, psychopharmacology and research advances in alcohol and drug problems.

THE COURT: Are those journals?

A Those are journals, except for the last, which is an irregular publication of volume that was originally meant to come out once a year but comes out less regularly than that.

MR. DOHM:

Q As a professor, I suppose it would be primarily as a professor at the University of Toronto you supervised a number of theses between 1965 and 1993 which appear on pages 5 through 7?

A That’s correct.

Q After that, you have a heading titled publications which commences with a page 1 and it continues to page 33?

A I believe that’s correct, yes.

Q Yes. Page 32 at the bottom half of page 32 includes works that are in press or submitted and page 33 is a continuation of that?

A That’s correct.

Q But up to page 32 you have three hundred and thirty-eight works that have been published?

A That’s correct. That is—well, the numbering is not consecutive from page 1 to 33. The first two pages are books which I’ve either written or been involved in as an editor.

Q Yes.

A And then starting on page 3, the numbering begins again with publications in journals or chapters in books.

Q Okay. So we add the first two pages, the first 22 to the number that I related earlier, 338, to get an accurate number—

A That’s correct.

Q -- that you’ve had published. Some of the publications that you have dealt with or have had as far as books are concerned are relevant to your purpose for being here. The first is Experimental Approaches to the Study of Drug Dependence, which is published in 1969?

A That’s correct.

Q You have a number of books published on alcohol and its effects.

A Yes.

Q The thirteenth item is Cannabis and Health Hazards, which is the proceedings of an Addiction Research Foundation World Health Organization scientific meeting on adverse health and behavioural consequences of cannabis use which you edited with a Professor Fehr?

A Dr. Kevin Fehr.

Q On behalf of the Addiction Research Foundation in Toronto in 1983.

A That's correct.

Q That's the report that we have referred to in evidence of a meeting that happened in 1981?

A Yes.

Q That report as I understand it is a consultative document?

A Yes, there was a conference held in Toronto involving experts in different fields who prepared individual background papers that they submitted in advance. These were discussed, debated and the proceedings represent the final agreement of the group on the matters that were presented in those.

Q Can you give us a rough idea of the number of participating scientists at that meeting?

A I can't recall exactly at this stage, but my recollection is that it was approximately fifteen.

Q And where would they have come from?

A They came from various countries. They came from the -- the chairman of the conference was from the United Kingdom. Other members were from the United States, Canada. There was—there were two, I believe, from North Africa, one or two, I don't remember exactly now. It's unfortunately long enough ago now that I can't recall who all the participants were. If I had the full book here, it would have been simpler to give you a direct answer.

Q Okay. The—you had a process for dealing with the publication that you finally produced to ensure that it met certain levels of agreement; can you describe that?

A Yes, the individual papers were—we were responsible, Dr. Fehr and I were responsible for editing them and largely for abstracting them and drawing from them the summary statement that was presented in court this morning. We drafted that and submitted that to all the members and to other experts at the World Health Organization for their comments and opinion and then

we redrafted a revised summary. The document which was discussed in court this morning was in a sense the executive summary of the volume that contained all the background papers and was also issued separately by the World Health Organization as its official report of the conference and then the finally revised report was again submitted to all the participants for their agreement so that as it eventually appeared it represented the consensus of the group.

Q Yes. Now, upon what scientific basis were these reports founded?

A Each of the reports, each of the sections in the separate chapters of the proceedings volume was a review by the respective authors of the world literature on that topic. Some included a substantial amount of their own experimental work as well. For example, Dr. Klonoff, who was mentioned this morning, included in his review or his in chapter not only a review of what was then known about cannabis and automobile driving, but also a summary of his own experiment which was at that time unique on driving in Vancouver on city streets in traffic under the influence of cannabis.

Q So what you had then was more than the opinions of the people attending, but had—you had their summaries of the world literature—

A That’s right.

Q -- divided by the chapters for which they were responsible.

A That’s correct.

Q Page—number 15 is Principles of Medical Pharmacology 4th Edition?

A Yes.

Q Published in 1985, and can you tell us what that is please?

A That’s a text book of pharmacology that originated in detailed notes which I began to distribute to the medical students in pharmacology course with the somewhat naive hope that it would allow them time and liberty to listen to the lecture and ask questions and make comments, rather than have to be busy taking notes all the time. Unfortunately that idealistic hope didn’t

materialize, but it did become eventually a departmental text book because as responsibility for different parts of the pharmacology programme in medicine was rotated among staff members year by year, everyone eventually came to have a hand in each chapter, so that it became a truly a departmental text book which was first brought together in the 1970's to make a book and then I became an editor in the 4th edition, I became the senior editor and the same book further editions are shown before, number 17 is the 5th edition and number 22 is the 6th edition which is currently in press, and this has become distributed in—well, I suppose one can say internationally to the extent that the publisher does actually ensure its sale or availability in other countries. It has been used fairly widely in Canada and the United States and to some extent in other countries. It's been translated into a Portuguese edition that is used in Brazil and Portugal and it's been—it's gone through two editions in Italy.

Q Now, you have a number of other publications listed starting on page 3. Of that number, there is—that's the number I mentioned earlier of three hundred and thirty-eight. Can you give us a rough approximation or a close one, in any event your best, how many of those would have been peer reviewed publications in the sense that they were published in journals that require a scientific level of peer review?

A I counted those up last night for purposes—for anticipating such a question and seventy-three per cent were published in peer review journals, that is two hundred and—just short of two hundred and fifty.

Q And can you tell us how many of those peer reviewed publications related to cannabis in any way?

A The twelve of those were publications arising from our own experimental work with cannabis.

Q They were based on your own experiments?

A Yes.

Q You have done a lot of work, it would appear, with respect to alcohol?

A Yes.

Q And how would you describe your level of work with respect to cannabis compared to others of your colleagues and peers?

A By level you mean amount of—

Q Amount of work.

A Well, it's clearly considerably less than some people who have specialized specifically in cannabis. On the other hand, I would say it's probably significantly more than most of the people who work in the alcohol field. The reason for that is that as a staff member of the Addiction Research Foundation of Ontario, I was required to keep abreast of the literature, not only on alcohol but on other drugs as well, and because of the concern among the general public and consequently among the various levels of government in the 1970's mainly, about the increase in the use of cannabis, I became obviously aware of many questions that—for which there simply wasn't adequate information available and therefore decided that our own group should try to answer some of those questions and that accounts for the publications on cannabis that we have in this list.

Q Are there particular items within your resume now as far as journals and publications are concerned that you think would be of assistance to the Court in further assessing your credentials beyond what Her Honour will be able to do by simply reading the list of publications?

A I think most of them are self-explanatory, but I might mention perhaps that there's one with my colleague, Dr. Kevin Fehr, which was done when she was a graduate student doing her doctoral thesis with me, which involved measurement of the composition of cannabis smoke, or at least of the tar content of cannabis smoke in comparison with tobacco smoke and I believe we were the first to do such a measurement. It has subsequently been reworked by various other groups, but that was in—let me see, where was that? Oh, that was number 79 on page—

Q Number 79?

A Yes.

Q Thank you. On page 9.

A Yes. Then we had a number on the metabolism of tetrahydrocannabinol, the main psychoactive ingredient of cannabis, and with respect to its distribution in the body tissues, its metabolism and elimination. We had one number 66 on the top of page 88, relates to electroencephalographic and behavioural changes produced by THC. It was my colleague, Charles Hawkman, who was a neuroscientist who at that time was particularly interested in electroencephalographic changes and the potential changes. There were some with Dr. Siemens who also did his Ph.D. work with me on the effects of cannabis on the metabolism of other drugs as a possible basis of interaction among them. And then the series of publications with Dr. Fehr and with Dr. Stiglick who was another of my graduate students on the effects of long-term cannabis exposure on the ability of rats to learn new tasks after their cannabis use had stopped and the question was whether there was any demonstrable residual long-term effect.

Q You have referred to these relating to cannabis, now were they all published in peer review journals?

A Yes. Some of them—one or two of them also appeared in conference proceedings, but all of the work was published in peer review journals.

Q In some of the materials that you published, they were noted as editorials, for example. Is an editorial generally considered something that one would expect to be peer reviewed?

A No. Usually editorials are invited by the journal and they're not ordinarily peer review. They're an opportunity for someone to express—for the authors to express their own views, either on a particular topic or their own commentary on another investigator's work that is usually being published in the same journal. For example, one of them—there was one on the effects of alcohol on the pancreas. I don't—

Q What's the number of that one, please, Doctor?

A I'm just trying to locate it now.

Q Okay.

A Sorry, I should have flagged these. It would have made it faster, instead of taking up the Court's time, but -- well, one number 42, pathophysiological factors in the ideology of alcoholism, that was by invitation of the Canadian Medical Association journal. Number 48, that's

the one that I was looking for. Alcohol, Pancreatic Secretion and Pancreatitis. There I was invited by the Journal of Gastroenterology to write a commentary on a paper which was to appear in the same issue of the journal by Dr. Hector Lorego on some experimental studies that he had done in patients and his paper was subjected to peer review, but my editorial would not be.

Q Thank you. And you still teach at the University of Toronto, do you?

A Yes, I'm—I am officially retired since 1989 so I'm not required to teach, but I still do teach. I give lectures in the pharmacology course for the medical students and for the specialists in pharmacology and toxicology, for the Arts and Science students who study—who are taking the specialist programme in pharmacology and some to the graduate students in pharmacology.

Q And can you describe for us what pharmacology means in the sense that you have just used it?

A Yes. Pharmacology, I guess the major source of confusion is with pharmacy and pharmacy is actually the study of the preparation and formulation of drugs, the chemistry of the drugs and quality control methods and so on; whereas pharmacology is the—is a basic medical science that deals with the effects of drugs on the living organism and the fate of the drugs in the organism and that includes how the drugs act, what they do, what happens to them and how they interact with other drugs.

Q And you have been teaching that since 1959?

A That's correct.

Q And what is—what concept of psychopharmacology has been distinct from pharmacology?

A There are some terms which are not too precisely defined and therefore one relies to some extent on current usage rather than on any hard and fast definition, but psychopharmacology now generally refers to the use of medications in the treatment of psychiatric illnesses. Behavioural pharmacology on the other hand is a rather a more basic subject that deals with the mechanisms of action and the effects produced by drugs acting on the nervous system that modify behaviour and not specifically restricted to the treatment of psychiatric illness.

Q And would—do I understand you correctly then that psychopharmacology should not be confused with a—in the sense that you use it with a coalition of psychology and pharmacology?

A Well, inevitably, psychology does come into the subject because one borrows techniques and concepts and methods of study of and from experimental and clinical psychology, but the emphasis is on the drug actions rather than on the basic processes themselves.

Q Thank you. And you have also taught the general principles of psychopharmacology at the University of Toronto, have you?

A Only as part of my teaching in pharmacology in general.

Q And since when have you been doing that?

A Well, that has been part of my work since 1959. For example, in the text book of pharmacology which I—of which I'm a senior editor, I'm also the chapter author for the chapters on the effects of alcohols, opiates, cannabis and other drugs that are sometimes loosely classed together as hallucinogens or potential hallucinogens on behavioural pharmacology, on addiction or drug abuse and addiction, and as well as some general chapters on methods of study of pharmacology, the methods of studying distribution of drugs in the body and the fate of drugs in the body itself.

Q Can you describe for us what the Addiction Research Foundation is, how it was created and what it does?

A Yes, it was created originally as the Alcoholism Research Foundation by an act of the Ontario legislature in 1949. There was concern in the immediate post-war years about the growing extent of alcohol problems among the civilian population and particularly, I guess, there was concern about alcoholism among ex-military personnel who had returned to civilian life and the government of the day felt that it should create an institution to study the causes and course, the evolution of alcoholism and evaluate methods of treatment, conduct research on treatment, and that was, as I say, created by an act of legislature in '49. It came into existence about a year later. David Archibald was the first executive director who essentially got it going, staffed it, and was the director for about twenty-five years.

In the 1960's when concern about the extent of use of—or non-medical use of other drugs, other psychoactive substances became widespread, the government felt the mandate of the institution should be changed, that it should no longer be concerned only with alcoholism but with alcoholism and the use or misuse of other psychoactive substances and so the name was changed to the Alcoholism and Drug Addiction Research Foundation.

Q How does that foundation function? Is it under control of a board or is it under control of a government agency or what?

A Under its legislative mandate it reports to the legislature through the Ministry of Health. It is supposed to be not an agency of the Ministry of Health but to report to the legislature through the Ministry. It has a board appointed by the government that oversees and advises on the programmes of the foundation and which also sets its priorities, and it also has the government mandated and its own research review assessments of the quality of the work done. There is or has been traditionally a quinquennial review that the foundation itself invites from outside experts to come and spend several days at the foundation reviewing the work in progress, reviewing the publications of the work past and offering its appraisal of the quality and orientation of the work and then in recent years there have been several similar reviews by outside groups set up by the Minister of Health, rather than by the foundation itself. I should mention it's also one of the collaborating agencies officially designated as such by the World Health Organization.

Q Are there many of those?

A A moderate number. I wouldn't say many. The—in Canada there are two. There's the Addiction Research Foundation of Toronto and the Addiction Research Group at the Douglas Hospital in Montreal, and both of those are official collaborating agencies. There are a number in the United States, the National Addiction Centre in the United Kingdom, at the Maudsley Hospital in London is one. There are some in other parts of the world, but on the whole, I would—I can't give the exact figure, but my recollection is that there are probably fewer than two dozen in the world.

Q And Maudsley is M-a-u-d—

A M-a-u-d-s-l-e-y.

Q -- s-l-e-y. Thank you.

A It's a very famous psychiatric hospital in London.

Q And what types of research have you done? What subjects have you used?

A The bulk of my own work has been animal studies. Some have been human, at least conducted in human subjects, but many of the things which our own group have been interested in investigating are things which cannot ethically be done in humans and therefore, that has to be done in the form of animal experiments. Among the human work, for example, we did studies on evoked potentials in human subjects smoking cannabis versus placebo marihuana and drinking alcohol. That is not included in the publication. That work unfortunately came to an end when my collaborator was offered a more attractive position at an American university and we didn't have the opportunity to finish it, but I have done studies, for example, in humans on the comparison of alcohol given as beer, wine or whisky on physiological and behavioural measures. We have—trying to think of the human studies we've done.

Q What is the normal way of studying the effects of various drugs? Is it to use animals? Is it to use humans? Is it to use other lab methods? Combinations?

A It depends—that depends entirely on the question you're trying to answer and on the methods that are available for answering it. As I indicated, some methods require a study of the brain tissue. Ethically, you cannot do that in humans. You can't administer a drug and then take a piece of brain tissue out to study it. That type of study is done in animals.

Behavioural studies are done in both. Drug metabolism studies typically are done first in animals in order to get an idea of what products, metabolic products of the drugs to look for or what metabolic effects of the drugs to look for and then they're done in humans in order to see whether the same things apply or if they differ, in what ways they differ. Studies on—of pathological changes resulting from chronic administration of drugs are done in both humans who are long-term heavy users and in animals to whom known amounts of drug are given by known routes for known periods of time. Again, in humans you are more limited in the types of question you can answer, again for the same reasons as I've outlined; whereas in animals you can do a much wider range of studies, but on the other hand you always have the problem of establishing whether something which you find in the animal can be extrapolated to humans or not and therefore, ideally one would want to have results from both.

Q Have you focused your research in any major areas over the past—over your career?

A Yes. There has been a change. Initially, my focus was mainly on metabolic effects of alcohol and other drugs, but then I guess in the '70's mainly, and from then on, my work became more and more concentrated on the effects on behaviour and we have been interested in acute behavioural effects, in tolerance that develop tolerance to those effects, in withdrawal changes, that is what is called physical dependence as manifested by a withdrawal reaction and also the extent to which the drug effects that mediate tolerance are related to those underlying learning and memory.

Q You'd better explain that.

A Okay.

Q Drug effects that mediate tolerance.

A Yes.

Q How the underlying learning and memory. Can you explain that?

A Yes. I'll try my best to explain that in non-technical terms. In beginning in the early 1970's our group found that tolerance to alcohol and to barbiturates and to a variety of other drugs was markedly enhanced or accelerated or at times only appeared if the subjects were called upon to perform a task of some kind while under the influence of a drug. In other words, the same amount of drug given at the same frequency to animals that didn't have to perform a task, failed to produce tolerance while administration to animals that had to perform the task under the influence of the drug did produce tolerance and this happened to fit in closely with work that a number of experimental psychologists had done on tolerance in the preceding few years which caused them to argue that tolerance was in fact a form of learning and we put forward the hypothesis that tolerance and learning share basic—the same basic mechanisms in the brain and that they can therefore be modified by the same interventions. For example, an inhibitor of protein synthesis in the brain had been shown to prevent new learning without impairing the performance of already learned tasks. We examined that and showed that the same thing applied to tolerance, that an animal which was already tolerant was not affected by inhibitors of protein synthesis but an animal which received alcohol or other drugs while concurrently receiving the inhibitor of protein synthesis did not develop tolerance.

Similarly, learning could be of another type. Learning could be what is called associated learning or more popularly known as Pavlovian conditioning. That, for example, when a—what a classical Pavlovian experiments were to present a tone when an animal was going to be given some meat and came to associate the tone with the presentation of the meat and eventually responded to the tone alone with a salivation response, just as it had originally responded to the presentation of meat with salivation. This is known as a conditional reflex, a conditional response, and what we found in relation to tolerance was that an animal which is exposed to alcohol every day in a given environment shows tolerance in that environment, but when tested in a different environment shows either no tolerance or very much less tolerance and it demonstrated that conditional learning contributed to the development of tolerance in the same way that it did to the acquisition of these associated responses and psychophysiology.

Q Have you done any clinical work in the course of your career?

A Yes. I worked as you noted in my curriculum vitae, I worked in the treatment of patients with alcohol and drug problems, mainly alcohol but to some extent other drugs at that time, principally sleeping pills in—at the Bell Clinic and then I did—oh, I was—you asked me before what other human studies I had done and I collaborated with a colleague, Dr. George Sereney (phonetic) at the Addiction Research Foundation to test the comparative efficacy of different drugs that were used in treating alcohol withdrawal symptoms. That type of thing was carried out in the clinical service of the Addiction Research Foundation.

Q Then in the clinical work you were working in a hospital dealing with patients?

A Yes.

Q But you were—if I understand it correctly, you were primarily a researcher as opposed to a clinical doctor?

A Yes. The work at the Bell Clinic was entirely clinical. That was not research activity that since joining the ARF and the University of Toronto, my work has been essentially all research.

Q You have also lectured since the 1960's in Finland, South American, England, the United States of American, Canada, Australia and Japan; any other country since we spoke about that?

A Could you read the list again, please?

Q Finland, South America, England, the U.S., Canada, Australia and Japan.

A Did you say South Africa? Yes, you did I think.

Q No, I said South America.

A Oh, South Africa as well. Yes, these were invited lectures by various universities and research institutions in different countries to give lectures on areas related to our research.

Q And I understand that those were on areas of drug dependence—

A Yes.

Q -- and the consequences.

A Drug dependence, tolerance and consequences.

THE COURT: Mr. Dohm, we've run a little bit past the half hour.

MR. DOHM: We should adjourn 'til the morning then, Your Honour?

THE COURT: Please.

MR. DOHM: Thank you.

THE COURT: All right. We'll see you all then tomorrow morning at 9:30.

MR. DOHM: Thank you.

(WITNESS ASIDE)

(PROCEEDINGS ADJOURNED TO 1997 JANUARY 30 AT 9:30 A.M.)