occurrence of large quantities, relatively large quantities compared to the experiments Dr. Allen has made, and when we talk of 50 parts per million, this is about 50 million times as much as you are using in your experiments, but often, not enough is said about the fact that quite a number of the samples that were tested had zero TCDD in them, and we don't know what the distribution was of the barrel with 50 in them, and the barrels with nothing in them, whether the analytical methods were sharp enough to be able to measure the presence of TCDD below one part per million.

We, of course don't know. I should rather suspect that the analytical methods were not available, but it almost becomes a moot issue when you, Dr. Allen, produce results at 10 parts per trillion, whether there was exposure to 40 parts per billion or 30 parts per million. I don't understand the dimension. I see no relationship. It is just that there was a heck of a lot of TCDD in Agent Orange compared to your experiments.

What I would like to get from you is whether you have ever tried to calculate quantitatively how much dioxin is needed to produce an effect in an animal, what is the least quantity that will produce it, and then for us to relate that to the least quantity that we can identify in the herbicides used in Vietnam. That would be an interesting mathematical calculation.

DR. ALLEN: The only thing that I can say is that in my more recent studies, we have found that 50
parts per trillion in the diet when consumed over a period of approximately six months, and it is about 3 tenths of a microgram per kilogram of body weight, will produce reproductive abnormalities, and over a period of two years, a consumption of 1 microgram per kilogram of body weight will produce obvious signs, gross signs, of intoxication.

DR. SCHEPERS: Have you found a no effect level?

DR. ALLEN: Not in non-human primates, no. We are going down to lower levels at the present time, but we have not found a no effect level when the exposure has been extended over a period of time.

At six months when they have consumed 3 tenths of a microgram, we did not see any obvious signs of intoxication grossly with the exception of reproductive abnormalities.

If we waited two years, we did see signs.

DR. SCHEPERS: What about the experimental model to compare to the experience of a soldier who might have been in Vietnam say six months in an area, combat zone, where he might have been contaminated in one shape or another, either sprayed on his head or in his clothes or in his water or whatever, and then he leaves? Have you got anything in your experiments, animal experiments to match that? In other words, a short period of exposure in the life cycle of the animal and then wait and see; that is the one we are interested in.

DR. ALLEN: The only one, and certainly it is far removed from your particular example, is in the 500 parts per trillion studies we had three that survived. We
have followed these animals now for approximately three years after they have been removed from the experimental diets. They have shown a dramatic improvement in their physical status. However, there are still abnormalities that we are encountering after three years of the exposure being discontinued.

DR. SCHEPERS: That would be the closest?

DR. ALLEN: That would be the closest that we have in our laboratory.

MR. LEMEN: You indicated this morning, though, that you did have tumors after two years on the ones that were sacrificed.

DR. ALLEN: We are talking about rats versus monkeys.

MR. LEMEN: Okay, but in the rat; you are talking about in the rats you saw the tumors?

DR. ALLEN: In rats, in the rats we saw the tumors. Monkeys are somewhat like the higher primates in that they do not develop tumors rapidly, so it requires a long period.

MR. LEMEN: I understand that, but in talking about the dose effect, if we are going to find anything, carcinogenic effects in Vietnam veterans, it is not going to occur for another 15, 20 years?

DR. ALLEN: That is more than likely correct, unless we have promotion of existing tumors.

MR. LEMEN: Right.

DR. HABER: I wonder, Dr. Allen, I understand you brought some slides with you. Would it be possible for us
to see those now?

DR. ALLEN: It's up to you.

DR. HABER: How long would that take?

DR. ALLEN: Five or ten minutes.

(A discussion was held off the record.)

DR. ALLEN: (Showing slides) We will go through these rapidly. If we could focus that just a little bit, this is just one of the non-human primates, the Rhesus monkeys that we employed, and I want you to pay particular attention to the hair coat.

If we could have the next slide--this is an animal of six months of exposure, and you will note the near complete loss of hair, particularly about the head, and the abdomen, shoulders, and if you look closely, the animal has practically no eyelashes, and the next slide will show you really what the animal looks like.

Here is another animal at six months. You will note the marked edema about the eyelids, the absence of eyelashes. You can't see the dry, scaly skin, but you can see the development probably on the side there, little acneform lesions, and I think the particularly obvious edema at the upper lips and generally all over the face.

This is just an example of some of the hematological changes we saw. At the top, it gives you the normal values of the monkeys and you will note in the white blood cell count we had a very decided decrease from about 9,000 down to in some of the animals about 2,000; of course, with the platelets, average of 327,000 down to 234,450. You will note
the very decided decrease in platelets, and this is why we got what we feel is extensive hemorrhage.

The hemoglobin dropped from 13 down to 4, 6 and 8, as you see here, and of course associated with this is a decrease in hematocrits.

One of the more striking things that we saw was a marked thickening and proliferation of the fingernails and toenails, and note the clubbing of the peripheral digit there. This we feel could have been associated with the very decided decrease in circulating red cells.

We also got dry gangrene. The peripheral digits would very frequently sluff off, associated with the dioxin intoxication.

Another thing we saw, rather striking, was the decided increase in the size of the gall bladder, maybe five or six times the average size, and here we have a probe introduced through the ampulla into the common duct, and you will note the tip of it, you can get an idea as to the size of this gall bladder and the ducts.

When we examined these, there was a marked thickening of the walls of the various ducts and the gall bladder associated with hypertrophy and hyperplasia of the epithelium.

This is just an example of the hemorrhage that we saw in the lungs of these experimental animals, and a rounding off of the heart, which was associated with the very decided anemia that these animals were experiencing.

This is just hemorrhage in the uterus. That was
very common in the animals that died.

The bone marrow, of course, there is the near complete absence of bone marrow, and the hemorrhage in the marrow.

The next slide shows hematopoiesis and a predominance of lymphoid appearing cells. Both the myeloid and erythroid elements were affected.

One of the more striking lesions was a marked thickening of the gastric mucosa, and to a lesser extent, the small intestine and large intestine. You note the hemorrhage on the surface of the stomach.

The next slide will show us the reason for this thickening. About three fourths of the way up is the muscularis mucosa, and toward the top is the lumen of the stomach and the increase in glandular elements in the submucosa.

Could we have the lights on, please, and the slides off.

DR. HABER: Thank you very much, Dr. Allen. We are enlightened by your presentation.

I would like to call attention to the fact that Mr. Max Cleland, the Administrator of the Veterans Affairs, has taken time from his very busy schedule, and has flown in from Atlanta so that he could address this group.

ADMINISTRATOR CLELAND: I would like to thank you all for helping us in the Veterans Administration make some sense out of what has become possibly a very serious public health problem to Vietnam Veterans, and myself included.
I want you to know that I have a personal interest in the resolution of the questions surrounding Agent Orange. The Veterans Administration is quite concerned about the aftermath of exposure to Agent Orange, and we have picked you all to help us and lead us and guide us in the resolution of the questions surrounding Agent Orange.

One of the most difficult things I have had to do in the last few months is to try and answer questions about Agent Orange in a vacuum of ignorance, and in an area where even the scientists who are most knowledgeable about herbicides disagree.

That puts us in a very ambiguous and difficult position. We hope that this Committee will move with the greatest speed to resolution of these problems, which we face daily.

There are many interested citizens in this country who are concerned about the effects of herbicides on people and we are especially interested in the effects of herbicides on veterans, and whatever the data shows to be the case, so you all have a great challenge because we are greatly challenged as an agency that deals with veterans, and purports to deal especially with the health problems arising therefrom.

You are challenged to help us meet this quite serious question of Agent Orange, so I just want you to know that I am personally interested in your deliberations. I look forward to reading the minutes that you all have
accumulated today. There are others who will follow every word, and each point raised with much interest.

You have a great responsibility. I know you will tackle your job very well.

I thank Paul Faber for leading this Committee in its deliberations. I know that there will be a great deal of give and take and a great flow of information, and ideas and sharing of opinions and views.

I urge you to do that because we look upon you as the mechanism by which we can air all the complaints or ideas or fears, and especially the scientific data surrounding the questions of Agent Orange and herbicides used in Vietnam, so I just speak as the head of the Veterans Administration, and also as a Vietnam veteran, urging you to tackle your job seriously, and especially as Administrator thanking you for your willingness to take time from your busy schedules to help us with this most serious question.

Paul, thank you very much for the opportunity to visit. I know you have some other items on your agenda and I won't interfere. I will now resume my duties, but I did want to visit with you personally and tell you where I was coming from and how much we needed you to guide us in the future.

Thank you very much.

DR. HABER: Thank you, Mr. Administrator. I am very encouraged by this morning's discussion. It looks like we are beginning to make real progress.
ADMINISTRATOR CLELAND: Thank you very much.

DR. HABER: Thank you, sir. Dr. Allen, would you care to resume your presentation?

DR. ALLEN: (Showing slides) This is just a typical example of the marked thickening that occurs, and the gastritis that develops in animals exposed to the dioxins. Very frequently there are ulcerations that are also associated with this hypoplastic gastritis, and in my instances, we feel that these severe changes in the gastrointestinal tract are associated with the demise of the experimental animals.

Dr. Moore and his associates have done a considerable amount of work with the effects of the dioxins on the immune capabilities of the animals, and certainly in our experimental animals we got a marked decrease in the lymph nodes throughout the body. This is just a typical example of hypocellularity that occurred in the lymph node, and with the decrease in cellular population, of course, there was necessarily a decrease in the immunologic response of the experimental animals.

This is hair follicles. You note the swelling of the eyes that occurred in the experimental animals. This is what they looked like microscopically, and the hair shafts are filled with keratinized material.

This also occurs to a lesser extent in hair follicles over the surface of the body. One of the more striking things that we saw was the marked changes that occurred in the epithelium throughout the body.
changes in cell types suggestive of, quote, possibly transformation of one cell type to another.

This happens to be pancreas, and generally speaking, there are very few, if any, mucous secreting cells in the epithelium.

Here we have a marked increase in the cells. They would normally be in the epithelium. They would be stratified in the epithelium.

Here we have a change in cell type. The same thing occurred in the salivary glands, and also in the bile ducts, indicating a change from one cell type to another as a result of exposure more than likely to the dioxins in one way or another.

We also saw marked changes in the transitional epithelium of the urinary bladder, not only changes in cell types, but also a piling up of the epithelium.

I just wanted to show you the reproductive abnormalities that occurred. It would appear that this is one of the more extensive. If you look only on the left side here, there is the 50 parts per trillion study animals, you then note the 500 ppt; compare the two. Total impregnated, 3 of 8 on 500 ppt. and we got 100 percent in our control animals on both experiments.

Total impregnated with 50 ppt, six of eight abortions, with four of eight in the 50 ppt and two of eight were normal births on 50 parts per trillion, two of eight, and one of eight on 500 ppt.

Also one of the more critical things that we are
concerned about in our study is the effect upon fetal
development, and as quickly as we are able to have sufficient
numbers of infants survive, we will also be doing learning and
behavioral studies in an attempt to see if there are any
deficiencies.

We have found with other halogenated hydrocarbons
alterations in the learning capability, and the animals
show behavioral deficits, so we will be pursuing these
particular questions.

That's it.

DR. FABER: Thank you very much, Dr. Allen.

Those slides speak eloquently of your work. We are
indebted to you.

DR. MOORE: Dr. Haber, could I just make a
comment about dose which is where we were going earlier?

I think one of the things that I feel very strongly
about is that despite all of the work that is available
experimentally or anything else with respect to the
benzodioxins, we do have some understanding as to the
kinetics of TCDD in the rat. We have a bit of data of TCDD
in the primates, but we don't have good comparative
pharmacology, and until we get that type of data, we are
going to be hard pressed or whistling in the wind in trying
to extrapolate from primate or rat or guinea pig into dose
the same as man because we don't have good dose response
ratios.

DR. KEARNEY: That brings up another point. I
notice in our schedule that the last five minutes will be
devoted to future meetings. I am wondering if it is in order in light of the fact that you have represented on this panel various sources of expertise and what they can get from their agencies. However, due to a number of things which are evolving, there are people who now have summary information on such things as human exposure, and I don’t think the group is aware of it.

I only became recently aware of this myself. I am wondering if at some time we could spend more than five minutes talking about the future meetings, as to what sort of things we need to hear, for us to make some sort of an intelligent decision?

In other words, I think this thing of human exposure is very important. I think the Environmental Protection Agency has taken the point of view that if the risk is high, that is suspect as a carcinogen, and if the exposure is low, then the hazard is low. If the exposure is high and the risk is high, then the hazard is very high, and these kinds of deliberations go into making some sort of an option on the pesticide.

We may have to take that same thinking process to deal with this situation. What I suppose worries me a little bit I guess I don’t understand what the levels of exposure in Vietnam were, and maybe we won’t get to that, but I would like maybe the Air Force to give us their thoughts on this, if someone can do this.

I am aware of some exposure research underway right now on 2, 4, 5-T, which I think might be usable to us.
I am aware of someone who is beginning to summarize the teratology data. I think it might be helpful if we could bring these people before the group and gain what we can from them. I think this is rather important as to where we go from here.

DR. HABER: Let me explain the item that is labeled 3:25-3:30, future meetings. That was to decide only the date of the next meeting. It was not to attempt to address any substantive issues, but only to take five minutes to agree upon a date, but I think that the composition of the Committee is mandated by the charge we have in "The Federal Register."

That does not, however, prevent, and I would certainly suggest that we should bring before the Committee experts of whatever stripe or disciplinary background or persuasion that we can get in order to enlighten us.

In other words, this group is not yet complete. We have had a recent resignation for reasons that I won't go into here, and a replacement will be sought for that individual, but except for that, I think the group is pretty well set. It was chosen very carefully, and I think that I would only echo Mr. Cleland's confidence in the group.

Again, if we need outside expertise, that is not of the group, from whatever source, we can obtain it and should, and I would say that people who can provide us with it ought to be available.

I think this Committee will continue to meet periodically as we see fit, but again, we should be able to
make available to us all kinds of expertise, and I would be completely subject to the wishes of the Committee. I think that if any of you wishes to suggest a presentation by somebody, we can certainly arrange for that as soon as appropriate.

I would like at this point to distribute--there are a number of copies for the group here, and there may be enough for members of the audience as well--and these are some questions which we will refer to the Committee to be answered.

We will prepare position papers on all of these questions unless we feel a question is encompassed in another, along with questions from the audience.

If any of you have any written questions, would you please submit them to Mrs. Myer so that we can--because what I would like to be able to do is to address--let me go over this list of questions briefly, and I will endeavor to secure answers to these in the form of position papers. I will quickly read these questions, and if anybody has any comment or further question, please feel free to mention them.

These are questions framed by our Steering Committee through the Advisory Committee. Remember the Steering Committee, with Dr. Levinson as the chairman, are the action group, and we are the advisory group here. If they need information or advice about particular aspects of the Agent Orange problem, each work group is to find the answers itself or to get the answers from others.
I will quickly read these. One, do the available data on exposure of Vietnam veterans to herbicides permit the performance of scientifically valid epidemiological studies on the long-term health effects of herbicides in this group?

I think that clearly is a substantive question for which we will endeavor to get an answer. As I say, we will have position papers in answer to each of these questions which would be made available to the public and will form part of the record.

Two, what are the best human population groups in which to study the long-term effects of herbicides on health, and how may these studies best be conducted?

That relates to the question you just mentioned.

Three, of what diagnostic value are the following procedures in assessing possible herbicide toxicity: levels of dioxin in fat pad biopsies; study of immune factors; study of chromosomal patterns; and study of liver microsomal enzymes?

What additional diagnostic procedures should be considered?

The first of those will be answered by Dr. Lee's study, and he will be communicating that to us as soon as those studies are completed, and it may be that Dr. Lee and Dr. Hobson will have to advise us where those studies will lead and whether indeed they would generate other studies of a similar nature.

We have, as I have indicated, a number of suggested
items for research that Dr. Hobson and we will be responding to presently.

Question 4, is it possible for herbicides to have long-term adverse effects on the male reproductive system?

That question certainly surfaced. We recognize it, and we will continue to pursue that.

Five, what topics should be included in the educational curricula being developed to upgrade knowledge of potential herbicide toxicity among VA staff members?

One of the things we have tried to do before is to make the staff of our field hospitals responsive to the needs of veterans who come in complaining of dioxin poisoning or toxic effects of dioxin.

This is a continuing process. We get out information to our field as quickly as possible. Dr. Lee's study will have some effect on this. Physicians had to be brought on board with respect to the possible toxic effects, and he has gotten cooperation from a number of hospitals in doing these biopsies, so this itself contributes to the general knowledge on the part of our professionals throughout the hospitals.

Six, what sorts of animal studies would make the most important contributions to understanding the potentially toxic effects of herbicides in humans?

Clearly it is an important question.

Seven, what additional data should be included in the VA's herbicide registry over that being currently produced?
Dr. Castellot, can you tell us about the herbicide registry and where it is now? Is that a fair question?

DR. CASTELLOT: I can't give you any specific data in terms of how many names have been entered into the registry, but at the present time, on a quarterly basis, each of the field facilities, and there are 172, are required to submit data on the individuals who have presented themselves or were sought out in their particular geographic area with regard to herbicide exposure, and as you heard this morning, the history and physicals and other laboratory data which are accumulated at that time are submitted to the Central Office for review. That review is an ongoing process.

Dr. Levinson has the specifics in terms of the numbers involved, but it is an ongoing process and will be accumulated and will eventually I'm sure be subject to rather specific analysis in terms of determining any trends that may be developed, but that is an ongoing process here in the Central Office and the multi-disciplinary board which is reviewing all of these, so it is not done by any single individual.

Many of the people on the Steering Committee are involved with that as well.

DR. HABER: Eight. What are the known facts on the persistence of dioxin and the herbicides used during the Vietnam War in water, soil and the atmosphere?

Can these media serve as a source of human exposure to dioxin and herbicides?
We have touched on that, and clearly we need more data on the chemical formulations and how they persist.

Nine, what medical tests should be utilized to help establish a diagnosis of chronic herbicide-induced toxicity among Vietnam veterans?

One of the most vexing problems we have when veterans come to us is when a veteran says I don't know. I think I have been exposed, and I don't know whether I am sick or not. Can you please study me and tell me whether indeed I am harboring long-term ill effects of dioxins unbeknownst to myself, and what test would one do?

Well, faced with a situation like that, all we can do is the general physical, complete blood count, X-rays, general EKG, electroencephalogram, and so on.

There is no laboratory test at this point which would say yes, you have been exposed or no, you haven't. Liver profile, sperm count, all of those things are done when people come in with symptoms referable to that particular organ system, but unless the biopsy or the fact proves out, and if it does, we may have albeit a difficult and not trivial biopsy procedure that will be of help, if our current pilot studies prove out.

Ten, can criteria be established for determining the level of exposure of military personnel to dioxin during the Vietnam War based on spraying tapes and unit histories?

We will undertake to try to answer that.

Finally, will it be possible to develop standards and criteria which define the precise relationship between
herbicides and dioxin with chronic adverse effects in humans?

Can these criteria also specify the reasonable limits between the time of exposure to herbicides and the development of disease?

These questions have been submitted by our Steering Committee, and as I indicated to you, we will get answers for them and position papers on each of them.

I have here several questions submitted by the floor, and I will undertake to read these. If the answer is quickly forthcoming, we will attempt to give it to you. If not, we will treat these questions in the same way that we would those submitted from our Steering Committee and provide position papers in answer to them.

One, what is the U. N. doing concerning Agent Orange which may have an effect on U. N. troops that served with us in Vietnam?

Does anybody around the table have any answer to that?

Okay. We will undertake to get an answer and give it to you. Who submitted this? Does anybody want to be identified with that? Do you have any further amplification?

MR. GERREY: No.

DR. HABER: We will try to get an answer.

MR. DE YOUNG: There has been some rumors around that we have heard that Australia and the Republic of Korea have taken a claim to World Court; something having to do...
with troops being poisoned. It is total rumour, to my
knowledge. I think it is totally false.

DR. HABER: We will undertake to find out that
at the same time.

Next question, when is it likely that significant
results from the Ranch Hand study will begin to become
available?

Colonel Thiessen, can you give us any answers
on that?

COL. THIESSEN: The results of the retrospective
study, which is basically the questionnaire type study of
all 1200 people, should be available by the end of 1980.
The cross-sectional study is the physical study
on selected individuals and should go on at more or less
the same time. It should also result in data at the end
of 1980.

Of course, the prospective study will take years,
but there will be interim results at the end of '80, '81
and so on and so forth, until 1985 when the study is con-
sidered to be finished.

DR. HABER: That is something I would like very
much for our Committee to be able to do. As I indicated
to you, I have done that, so we would like to try to get
some answers as to when the definitive study will be
completed.

Obviously everybody needs to know that from a
policy standpoint. It is extremely important.

DR. ALLEN: You are going to get us the
experimental protocol on this?

   DR. HABER: Yes, sir. I have made that agreement with them, and General Dettinger was very forthcoming and said he would.

   MR. LEMEN: I have one question. You said that the prospective study was going to be cut off in 1985?

   COL. THIESSEN: That is as the plans are now. Our protocol will be before the Committee for approval.

   MR. LEMEN: My comment is that if you are looking for carcinogenic effects, you probably would miss them if you cut them off the study in 1985.

   DR. HABER: We are very mindful of that in the VA, and we intend to follow identified people.

   MR. LEMEN: Have you got a group already identified.

   DR. HABER: I think that when we get the protocol we can make that comment. I am sure they will have to match men with capability and money and so on, but on the other hand, I think that while we want quick answers, I think it is incumbent upon those of us who are following these people to be prepared to follow them for a long period of time.

   Dr. Hobson has talked to me about that several times, so we are well aware of that: 4.2 million veterans reportedly may have been exposed to Agent Orange. I think that is probably not true.

   I don't think 2.4 million people were in Vietnam. However, the question is, is gross
information on subsequent health of many of these individuals available, and might it be useful?

There is no question that it would be useful. I would say the information—who asked that question?

MR. STONE: I was just wondering with the protocol that has been made, of perhaps trying to contact very large numbers of the individuals who may have been exposed.

The 4.2 million figure I believe comes from VA testimony last October.

DR. HABER: I hope not.

MR. STONE: Before the Subcommittee on Health.

DR. HABER: I gave that testimony, and if it is in there, it is a misprint.

MR. STONE: Perhaps they had the figures reversed.

DR. HABER: I think so.

MR. STONE: The proposal has been made that perhaps a general notification process of veterans who may have been exposed would be justified, and that useful information might be forthcoming.

DR. HABER: That is certainly something that is very much in our minds. That would be an extremely tedious expensive and difficult action to take, but on the other hand, if the facts warrant that, and if that is the advice of our Advisory Committee, if that is what they think, then we would undertake to do that.

I think that is something that is very good.

Dr. Schepers gave me a note.

DR. SCHEPERS: The question is whether we have health records on Vietnam War veterans. They are mostly Acme Reporting Company
young people, and they are still employed mostly, and so they don't come to the veterans hospitals, but we are already currently seeing about 150,000 of these Vietnam War veterans in our hospitals annually, so we are developing an enormous amount of medical information of a general kind about them, and this information is available to the Committee through Ms. Kilduff.

DR. HABER: The VA expressed extreme scepticism about the possibility that dioxin would be traceable in human tissue of even heavily exposed veterans. What will be the significance of a finding from the present tests of no detectable dioxin cases?

Well, it is difficult for me to anticipate the answer, but I think, and I will ask Dr. Hobson to comment on this, what our present study is designed to do is to tell us whether or not a fat biopsy would be useful in distinguishing between people who have been exposed to dioxin in Vietnam, and controlled subjects.

If that turns out to be the case, then we have a potentially, maybe not definitive, but useful way of determining whether others who claim they were similarly exposed do indeed store dioxin in their fat tissues.

It does not specifically say no, you could not have been exposed, and we don't pretend it is. Larry, do you have anything you want to say?

DR. HOBSON: No, except that we would not under
any circumstances be going beyond the data if with the

detection methods we had available to us, we could not
find any in the fat. If it is there, we would give the
amount that we were able to detect,

DR. LEE: Quite evidently if you find dioxin
in the fat, it means there has been exposure, but it does
not say when or where. Neither does it say that there
will be disease as a result of it, either currently or
in the future.

If you do not find dioxin it does not say you
were not exposed, and it does not say that you won't have
future difficulty from the exposure if dioxin was there.

As Dr. Haber pointed out, the only thing this
will do, if there is dioxin present in those exposed and
not in controls, is to tell you that these are individuals
who can and should be followed, and that they do have known
exposure proven, simply by the fact that the dioxin is in
their tissue.

I might also say that those people who are exposed
agriculturally or in the manufacture, probably have the
same problem. It may be that we should put in a third
group that would be a control group from neither industry
nor from the agricultural people to see if they have the
same sort of thing.

At the moment, all we know is that we have 16
people who had had a biopsy, and if there is dioxin in any
of them, we will find out if it is in the controls or the
others, and it does not indicate that they are or will be
sick, or that they won't be.

DR. HABER: Thank you. We have here a number of questions addressed to specific members of the panel. Incidentally, the gentleman who said the 4.2 million quotes correctly. That is what the testimony said. That was an error, and I want to retract that. It was 2.4 million. It was a typographical error.

MR. DE YOUNG: There is good reason from where we sit in Chicago to say that 4.2 million is probably an accurate figure, the reason being that many stateside bases under the Freedom of Information Act have admitted to using 2, 4, 5-T during that same period of time, and so it is very reasonable to assume that anyone who was in uniform at that time came into contact with it, possibly in lower dosage at stateside, but into contact with it.

DR. HABER: That opens up a whole new range of possibilities.

MR. DE YOUNG: We have reports from men in Panama who said the jungle was defoliated. In Louisiana, it was made to resemble Vietnam by defoliation and so forth.

DR. HABER: That is a very interesting piece of information that we will have to deal with, so we will take that under consideration, too.

A number of questions have been addressed to various members of the panel. To Dr. Erickson--what is the usual percentage of wasted pregnancies in the population?

DR. ERICKSON: It depends how hard you look.

The best studies that I know of come from the Hawaiian Island
of Kauai where something on the order of between 25 and 30 percent of pregnancies were wasted. A typical figure I think is something on the order of about 15 percent. It depends how early into pregnancy one is able to ascertain the fact of pregnancy.

MR. LARSON: Please define wasted.

DR. ERICKSON: I presume that meant lost at term, live birth.

MR. DE YOUNG: I can define it. The toxicologist in Chicago used the term to mean any pregnancy that was not delivered of a healthy child, a pregnancy that was in some way abnormal, possibly a still birth, possibly spontaneous abortion, or a birth gross deformity.

The figure he gave was 10 to 15 percent, and I wanted to see what CDC's figures were on that, if you had any.

DR. ERICKSON: CDC doesn't have any figures of their own, but this Hawaiian study was of a population on a small Hawaiian Island where all the women of reproductive age were registered and followed on a monthly basis so that very early pregnancy losses could be determined and studies where you will find the figure of 10 to 15 percent, usually the ascertainment of pregnancy is later into pregnancy, and there is a quick falloff from a fairly high in early pregnancy to a lower level later in pregnancy.

MR. DE YOUNG: Thank you.

DR. HABER: The next question is addressed to Dr. Kearney, and it is, what are the other ways, quote, unquote,
of production of 2, 3, 7, 8, TCDD, other than TCP?

DR. KEARNEY: What are the other sources of the
2, 3, 7, 8 other than in the production of the 2, 4, 5?

DR. HABER: Right.

DR. KEARNEY: Well, there appeared, and I don't
have the dates on this exactly, in '75, '76, reports from
Europe that industrial incineration was giving rise to
dioxin materials, and these are reports from Rappe, and
Dr. Otto Hussinger from Amsterdam, and Dr. Boozer at
Boshart in Switzerland.

It appeared that any situation where you had
chlorine and industrial wastes that were incinerated at
high temperatures, could be a
source of dioxins.

The Dow study went further than this. They
repeated the European studies. They looked at mufflers.
They looked at wood burning fires. They looked at
industrial incinerators, and they looked at municipal
incinerators, and there were dioxins associated with each
of these, so this raises the question -- are there other
sources of dioxins other than the production of trichlorophenol,
and it raises a question as to the biopsy study -- do you
have proper controls so that you would see Vietnamese veterans
not in Vietnam who were not exposed, although this
question of the Vietnam veterans not in Vietnam being
exposed raises another complication.

DR. MURPHY: Dr. Kearney covered it, but the
question asks 2, 4, 5-T at least as you traced it, and I
think he pointed out trichlorophenol, which I think is important to recognize, 2, 4, 5-T is not the only product through which trichlorophenol, in the production of trichlorophenol that you get the TCDD, and wherever you are producing that--many processes.

DR. HABER: My understanding was that it was a degradation product as well as a deformation product. Is that true?

DR. KEARNEY: Now you raise a very interesting question. For example, I understood the question to say phenol, but maybe it said 2, 4, 5-T.

For example, in Italy what was being produced there was trichlorophenol for the production of hexachlorophine and most of the explosions in Westphalia were trichlorophenol-producing plants rather than 2, 4, 5-T producing operations, so that is a question.

You can get pyrolysis of certain phenols and 2, 4, 5-T, and you can produce TCDD. It is also possible that is a source, so that there appear to be a number of sources, and this does further confound the issue.

That's all I am prepared to say.

DR. HABER: Thank you. Dr. Lingeman, you have been asked to answer two questions. You asked about other herbicides used in Vietnam, and if the Committee was to address the story with Agent Orange; do you have any information on their health effects which leads you to ask, and are you recommending this study?

DR. LINGEMAN: Other herbicides are known to
be carcinogenic, including several arsenal compounds; some of the inorganic compounds are known and accepted as human carcinogens.

One of the others in Vietnam was picloram. It has been tested by the National Cancer Institute and there was a possible increase in hepatic nodules which are considered by some to be pre-cancerous conditions in rats, so yes, the answer to the question is other herbicides are known to be carcinogenic, and possibly toxic in various ways.

DR. HABER: I think the question would be are you recommending such a study?

DR. LINGEMAN: If other herbicides were used concomitantly with Agent Orange, I believe that they definitely would be relevant.

DR. HABER: Our information is the amount they used was almost trivial. Is that not true?

MR. LEMEN: Just to add on to what you have said one of the things that concerns me is the massive use of the related compounds, particularly the pesticides used in Vietnam that have thus far not been addressed.

I would like to agree with you to say that I think the pesticide issue is one that may well be just as big as the herbicide issue, and we should certainly look into it at the same time.

DR. HABER: I think that is important, and we should obviously address the official charter of this Committee, the VA Advisory Committee on Health-Related
Effects of Herbicides, but I am sure that narrow
construction was because of our main concern about Agent
Orange, but it would not stand in the way of our getting
other information made available.

One final question from the group. This one was
signed by Mr. Donald A. Larson. To what extent is information
potentially available on the effects of Agent Orange on the
indigenous Vietnam population?

I would like to answer that and that is to say
that there is information available in the original National
Academy of Sciences report, and then we have the report of
Dr. Tung, and other people, which we have to look at
more carefully and continue to see whether or not we can
get updated information.

I think Dr. Tung is anxious to cooperate with us.
Wasn't that your impression, John? You may have been here
when he briefed us and expressed the desire that he could
continue to work with us, and I think we will certainly
try to make available from him any information which is
of value.

I think Dr. Allen has already characterized it
as lacking the quantitative sophistication that we are
accustomed to, at least in this country, and one has to
understand he was in a war-time condition and maybe some
of the niceties couldn't be observed.

MR. LARSON: I meant general. That was an isolated
instance. I meant general.

DR. HABER: As I said, we will endeavor to review
the minutes. If we feel the questions have been definitely answered, we won't deal with it any further. If it was a more substantive question which could not have been answered precisely and must therefore only represent a tentative view, we will develop a position paper on this.

There are two people who I would like to specifically call on if they are present. Mr. Frank McCarthy, is he present, or is Mr. Michael Gerkey present?

MR. GERKEY: Did you have a question you wanted to ask me?

DR. HABER: I was informed by the Administrator that you might wish to make a statement, and if you do, this is the time and the place.

MR. GERKEY: Okay. Then I guess I will have to do it.

What I am basically concerned about is the effect of Agent Orange on the world, as there were people from different parts of the world who served with us in Vietnam who most likely, if we were affected, would have been affected. They were part of the United Nations. I feel that if any research is to be done to help us, there should be research done to help them also, and they should be made aware of the effects of Agent Orange on the populations in their countries. There should be some sort of a world organization set up to work with scientists and work with people in the Veterans Administration and work with people at the local level, at the state level, at the
government level, along with the military level, and
I believe one should look into this matter and pursue it.

DR. HABER: That's good. We are indebted to you.
I think that is an excellent suggestion. There have been
a couple of indications around the floor that the people
in the U. N. may have been involved. I think it is only
fair that we make some representation through the
Administrator's office to the World Health Organization, or
some other international body, and offer to share with them
the possibility of our getting data on that, so we will
do that.

In the future, we will have opportunities for
those of you in the general public who wish to make prepared
statements to the group, and we will, in our "Federal
Register" notification, indicate that if anybody does wish
to make such a prepared statement, if he submits it to us
before, he would then be asked to read it before the
general group, and we will make provision for that.

This being our first meeting, that has not been
deemed possible, but I would suggest that if others
in the audience wish to make brief statements not
exceeding five minutes in length, we would be anxious to
accommodate you, so if anyone wishes to make such a
statement, will you please come to the microphone and
identify yourself and please confine yourself to no
more than five minutes.

MR. DE YOUNG: Frank McCarthy is not here today.
I saw Frank in Kansas City last week and Frank said
essentially that he didn't feel it was worthwhile coming because he thought the purpose of this Committee was to whitewash the subject.

I no longer think that. I no longer think that. I came here specifically to watchdog this Committee from my point of view.

Let me get into my prepared statement, and maybe it will make some sense.

I am the Veterans Services Coordinator at Columbia College in Chicago. It is under the VISA program funded by HEW.

Eighteen months ago, an extremely agitated woman appeared in my office in Columbia College in Chicago. Her name was Maude DeVictor, and she was at that time a VA Benefits Counselor at the Chicago Regional Office.

She told me of 27 cases of cancer among Vietnam veterans she had seen there in the Chicago Region. They all had one thing in common besides cancer. All served in areas of Vietnam defoliated by the now almost mythical Agent Orange.

She went on to show me the research she had compiled articles from scientific journals showing evidence of the herbicide 2, 4, 5-T's ability to cause skin problems, cancer, miscarriages, mutations, and birth defects; letters and notes of phone conversations with scientists and researchers who provided further statements documenting the contamination of herbicide with dioxin, that most toxic of all man-made chemicals.
She further told me that she had written the VA Central Office repeatedly about this and received no response. The claims for service connection for these men had not been granted.

We decided that the veterans of the Vietnam War had the right to know if Agent Orange had caused these problems 5, 10 and 15 years after their exposure, so we asked Mr. Bill Kurtis with WBBM-TV, CBS in Chicago to have his investigative team research Agent Orange and its dioxin contaminant.

For six weeks they traveled the country pulling in all the loose ends, and trying to weave together the pattern of dioxin poisoning that had emerged in so very many widely scattered episodes—dead horses in Missouri, and the sick owners who had sprayed dioxin-contaminated oil on their horse barn; dead Rhesus monkeys in an experiment done by Dr. Allen in Wisconsin; deformed goats and ducks and sick people in Globe, Arizona; sick residents of the national forests where Agent Orange like herbicides were still in use; and of course, veterans of Vietnam from Chicago.

In all those episodes, some common symptoms emerged—skin problems, hair loss, joint problems, headaches, nausea, fatigue, psychological changes, blood disorders, cancer, and birth defects.

The documentary that grew out of this, called "Agent Orange: Vietnam's Deadly Fog," was aired on March 23, 1978 in Chicago. WBBM referred calls to my office, and the ensuing weeks found me with an epidemic of calls from
Vietnam vets saying they, too, showed these problems—
hundreds of phone calls from all over the midwest from
vets talking about skin rashes persistent since Vietnam;
severe headaches; joint pains and swelling, often mistakenly
diagnosed as arthritis, and resistant to treatment;
nausea and continued fevers, some for seven years; extreme
debilitating fatigue; an endless progression of sick days,
days they had not been able to work; and an unending series
of colds, flu and other common ailments; mysterious stomach
disorders, intestinal disorders, urinary disorders, kidney
disorders, liver disorders, auto-immune responses; allergies
and blood disorders; and nervous system problems, typically,
numbness of the hands, arms, feet and legs; a collection
of psychological changes—tempers, violent behavior,
depression, anxiety, brooding, memory loss, confusion, an
inability to cope with the pressures of life, a loss of
resiliency, and cancers and tumors in men 25 to 35 years old.

Some doctors have described those as almost
unheard of in men that age.

They also reported difficulty in conceiving children
after their return from Vietnam. Many of them reported a
loss of interest in sex or physical impotence as well.

Some reported multiple miscarriages by their
wives, often followed by the birth of a child with severe
physical deformities, typically of the fingers and feet,
heart murmurs, and cleft palate, as well as hyperactivity
and learning disabilities of various sorts.

What was the VA response? "No firm evidence
exists to incriminate these herbicides." Men who were
legitimately worried about their health and their
children's health were brutally turned away with the statement
that their problems couldn't be from Agent Orange, that it
was all in their heads, and were sent to the shrink.

The news media in various cities picked up that
story. The Chicago pattern was repeated first in St. Louis,
then New York, Los Angeles, San Francisco, Denver and
Detroit. Each time the media carried the reported symptoms,
calls from Vietnam vets poured in.

Hundreds of claims were filed and denied. "No
firm evidence exists." Months later, a tissue biopsy was
instituted by the VA as a first step in determining whether
these vets had been poisoned by dioxin. In Chicago, the
tests were so badly handled that three vets in Chicago are
suing the VA for malpractice.

The first VA advisory committee on toxic herbicides
was established by the VA Central Office last year. It
was so flagrantly in violation of the Federal Advisory
Committee Act that it was abolished and this Committee
formed, an action that took a year, and which we applaud.

VA Central Office promised to issue instructions
to all medical facilities on how to test Agent Orange
victims. As late as three weeks ago, VA doctors were still
asking vets what is Agent Orange,

A document came to us which authorized the
destruction of certain tumor and cancer registry records, and
at the same time spokesmen from the Central Office were assuring me that all medical records would be preserved and sent to the National Cancer Institute.

Mr. Cleland denied any knowledge of the destruction of those records. Veterans all over the country have called in to tell us of the run-around, ignorance, the futility, the red tape, the insolence, and the outright malpractice of the VA health care system. The VA seems to have lost all credibility with this country's Vietnam veterans. It has broken faith with us by not telling us the whole truth at first. We got PR statements carefully worded to avoid any conclusions or responsibility.

Is it any wonder vets have not been beating down the VA's doors in haste to get medical care? Until the VA gives vets their legally mandated benefit of reasonable doubt and aggressively researches the Agent Orange, vets will stay away. Until the VA gives vets their rightful first-class medical care, courteously, sympathetically, and with dignity befitting their status as the warriors of our society, vets will stay away.

The VA must take the lead in Agent Orange research. In the past, VA doctors have won international awards for contributions to medicine. I hope that is not over. The VA must act immediately not in its own interest or in the government's interest, but in the interest of the vet.

Information must be gathered, and the start has been made, not only from the manufacturers of the chemicals, but from scientists and doctors and researchers.
without the vested interest of the petrochemical industry. The fox cannot watch the chickens.

Information must be sought from vets themselves, from service and fraternal veterans organizations, from environmental groups and individual citizens. The word must be put out to all Vietnam veterans—you may have been poisoned. Come in and get checked, but before we do that, we must have programs in place to do the testing, extremely subtle testing, checking more than just blood, chest and urine, and then we must provide treatment, and none of us knows where to begin on that.

Then there are children. Current claims by veterans that Agent Orange has deformed their children get administratively disallowed in that cold exactness of language so favored here in Washington.

These men want to know if their own government has crippled their children, and if they can safely have more children, and they need answers soon.

Because vets need these answers now, and because the VA has lost credibility, many of us of whom the Agent Orange questions were first asked a year and a half ago, veterans groups and citizens groups from all over the country have joined together to look for these answers, answers that can be believed.

We have organized an Agent Orange Task Force to seek out those answers and help those vets. This group is composed of representatives from ten veterans organizations nationwide, including the National Association of Concerned
Veterans, the Vietnam Veterans of America, the Vietnam Veterans for Self-Reliance, Vetline/Hotline, Agent Orange Victims International, Concerned American Veterans Against Toxins, and others.

We extend an invitation to other veterans groups to join us in this effort. We are gathering information on Agent Orange from veterans and researchers all over the country, and respond with the best answers we can as we go. These answers will not protect the chemical industry. They won't protect the government or protect the military or the VA. They will protect the vet.

Secretary Califano of the Department of Health, Education and Welfare has assigned the Assistant Surgeon General, Dr. James Dickson, to analyze our caseload data, looking for the patterns of illness emerging. Dr. Dickson will also listen to scientists, researchers, and doctors who have information on dioxin poisoning.

Secretary Califano has played his department's aggressive action to find answers to the questions of Agent Orange. We take him at his word, and hope this second herbicide committee will be as aggressive in the interests of Vietnam veterans.

The eyes of the nation are on this Committee. Twice as much of these herbicides were sprayed here in the U.S. as was sprayed on Vietnam. Whether they know it or not, the outcome of this Committee is important to every citizen of this country.

On top of the spectre of Three Mile Island, we
now have the spectre of Agent Orange, and I may add of
Agent White and Purple and Blue and Green and Pink.

I am here today with John First of Southern
Illinois University. I mentioned in my prepared statement
that St. Louis was the next city after Chicago to report
a large case. In about five weeks, John had 607 phone
calls for more information about Agent Orange.

I would like him to take five minutes, if you
wouldn't mind, and let him go through the data that he has
collected on that.

DR. HABER: All right.

MR. FIRST: I would like you to know that we do
not consider this scientific information. What we wanted to
do more than anything was find out what the people were
complaining about.

We asked them to tell us what they had experienced
since Vietnam. In an effort to avoid pre-disposing their
answers, we chose not to ask specific questions until they
had nothing further to add to their spontaneous remarks.

We have two tallies here. I would prefer to
call them accountings. Of the 607 reports that we got,
89 reported nothing but their name and address so that
they might receive further information. We received no
information from them.

Of that 607, 301 reported numbness and tingling.
That is 49 percent; 305 reported various rashes. A
significant number of those rashes were reported to have
acne-like eruptions. They come and go with time. They
are often reported to increase in severity with heat.

This tally includes a list of birth defects that are reported. I am not a doctor. I do not know the significance of these. I make them available to you in the hope that you will know whether or not they are significant in the general population figures.

We totaled 55 veterans with full intake, at which time we now have 89 percent reporting a rash. This is not a scientific sampling. They called on their own response to published symptoms which they recognize, for which they had failed to receive adequate treatment.

I do have copies of this available for the Board.

DR. HABER: We would appreciate that very much. Incidentally, let me now say that we would appreciate any representations from any interested parties—scientific, lay, of whatever description, and would undertake to make this information available to the concerned members of the Committee.

Additionally, anybody who wishes to make a presentation to us at times other than the meeting, can do so by writing or calling my office and arranging for such an opportunity. We would grant him a hearing, in addition to which we will have opportunities at future meetings for public statements of the kind we just had, to be read into the record, and the questions to be exercised.

I see by the clock that we are right on schedule, and I wish to thank both the Committee and the audience for helping us meet that precise time limitation.
I would like now to take a few moments to simply set the date of the next meeting, which ought to give us time to prepare our papers and to circulate documents among us.

Notwithstanding the fact that we are in the midst of the summer and people's schedules are disrupted, I would like to set this meeting for early in August, and my first cut will be August 9th.

Can you all determine if that is not possible for you? Dr. Murphy? When would be?

DR. MURPHY: Late in August.

DR. HABER: Supposing we make it early September, September 7th. Is that a possibility? Can everybody make it?

DR. KEARNEY: I will be in Europe.

DR. HABER: I think this is going to be difficult to do this way. I therefore think that it would be best to circulate several dates to all of you by some written communication, and then we will ask you to circle the most propitious date, and when we get the greatest number of attendees, we will convene.

Is that satisfactory to the members of the Committee?

MR. LEMEN: Yes.

DR. HABER: Dr. Schepers reminds me if you cannot attend, your alternate who has been named could attend, but we would like to keep the group as much as possible to this representation. We will give you ample opportunity to
indicate any problems.

MR. LEMEN: I have a question. You said that we would develop position papers. Are you going to be writing to us then to ask us to comment on these?

DR. HABER: Yes. We will handle these position papers in one of two ways. We will endeavor to make a preliminary statement which we will circulate to the group for corrections, or if we feel incapable of doing that, we will ask a small group of you, or one or two of you to help us frame the original paper, and then circulate it. You will not be tasked until I specifically contact you.

Is there any further business of the members of the Committee? If not, please accept my heartfelt thanks for what is a challenging and difficult task. I think it is well begun. I think I have gotten several new ideas. I am indebted to all of you for the dispatch and scientific way in which you have approached this very, very difficult subject, and I have no question but that we will produce the answers sooner because of the existence of this Committee than would otherwise have been the case.

Thank you all very much, and we stand adjourned.

(Whereupon, at 3:30 p.m., the hearing was adjourned, to reconvene at an undetermined date.)
REPORTER'S CERTIFICATE

DOCKET NUMBER:

CASE TITLE: ADVISORY COMMITTEE ON HEALTH-RELATED EFFECTS OF HERBICIDES

HEARING DATE: June 11, 1979

LOCATION: Washington, D.C.

I hereby certify that the proceedings and evidence herein are contained fully and accurately in the notes taken by me at the hearing in the above case before the VETERANS ADMINISTRATION and that this is a true and correct transcript of the same.

Date: June 18, 1979

[Signature]

Official Reporter

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I HEREBY CERTIFY THAT THE PROCEEDINGS AND EVIDENCE HEREIN ARE CONTAINED FULLY AND ACCURATELY, AS CORRECTED.

[Signature]

PAUL A. L. HABER, M. D.
Chairman
Advisory Committee on Health-Related Effects of Herbicides

August 7, 1979