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Transcript of Proceedings

VETERANS ADMINISTRATION

ADVISORY COMMITTEE ON HEALTH-RELATED EFFECTS OF HERBICIDES

Unedited

Washington, D.C.

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THE VETERANS ADMINISTRATION

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ADVISORY COMMITTEE ON HEALTH-RELATED EFFECTS

OF HERBICIDES

The Veterans Administration
Room 119
810 Vermont Avenue, N.W.
Washington, D.C.

10:00 a.m.
Monday, September 24, 1979

ADVISORY COMMITTEE MEMBERS PRESENT:

PAUL A. L. HABER, M.D., Chairman
Assistant Chief Medical Director
for Professional SErvices
Veterans Administration
Washington, D.C.

GERRIT W. H. SCHEPERS, M.D., Vice Chairman
Medical Service
Veterans Administration
Washington, D.C.

IRVING B. BRICK, M.D.
Senior Medical Consultant
National Veterans Affairs
and Rehabilitation Commission
The American Legion
Washington, D.C.

J. DAVIDSON ERICKSON, D.D.S., Ph.D.
Center for Disease Control
Birth Defects Branch
Atlanta, Georgia

PHILIP C. KEARNEY, Ph.D.
Chief, Pesticide Degradation Laboratory
Department of Agriculture
Beltsville, Maryland

ROBERT H. LENHAM
Special Projects Officer
Disabled American Veterans
Washington, D.C.

CAROLYN H. LINGEMAN, M.D.
Carcinogenesis Testing Program
National Cancer Institute
National Institutes of Health
Bethesda, Maryland

JOHN A. MOORE, D.V.M.
Associate Director for
Research Resources Program
National Institute of Environmental
Health Sciences
Research Triangle Park, North Carolina

ADVISORY COMMITTEE MEMBERS PRESENT (Con't):

SHELDON D. MURPHY, Ph.D.
Department of Pharmacology
University of Texas Medical School
Houston, Texas

WILLIAM HALPERIN, M.D.
Medical Officer
Robert A. Taft Laboratories
4676 Columbia Parkway
Cincinnati, Ohio

ADRIAN GROSS, Ph.D.
Chief, Toxicology Branch
Hazard Evaluation Division
U.S. Environmental Protection Agency
499 S. Capitol Street, S.W.
Washington, D.C.

MAJOR PHILLIP G. BROWN
Office of the Air Force Surgeon General
Bolling Air Force Base
Washington, D.C.

STEERING COMMITTEE MEMBERS PRESENT:

RICHARD A. LEVINSON, M.D., Chairman

JOHN J. CASTELLOT, SR., M.D.

STRATTON APPLEMAN

LYNDON E. LEE, M.D.

J.C. PECKARSKY

FRED CONWAY

MARGARET KILDUFF

DONELD HOWELL

PAUL LEGOLVAN, M.D.

LAWRENCE HOBSON, M.D.

DR. WILLIAMS

DR. ROBERT LOVE

I N D E X

PROCEEDINGS

DR. HABER: Good morning. I would like to convene the second meeting of the Veterans Administration Advisory Committee on Health-Related Effects of Herbicides on time at 10:00 o'clock, September 24, 1979 in conformance with the duly published notice of such meeting in the Federal Register. I would like to call the meeting to order and to give you the benefit of some observations that we have made since our last meeting.

I want to thank those of you who have made it your business to attend, and to assure you that we are looking forward to the deliberations of this today in an endeavor to get further clarification and much needed information about the problem of health-related effects of herbicides.

I would like to first point up a couple of business items. Dr. Allen just called us at 9:15 this morning, Mr. Williams tells me. His flight was delayed from Madison and he could not get another until this afternoon, which, of course, would put him here to late to participate in the meeting. Therefore, he will not be in attendance today, and his absence will be noted and his presence missed. We will, of course, endeavor to get him complete information, and his input into our deliberations and decision making.

I would like to call to your attention the fact that some specific progress has been made. The minutes of the last meeting have been developed, and action papers have been developed. We can get copies of the minutes of the last meeting and indeed, this or subsequent meetings to individuals. Our facilities do not permit us at this time to get tapes of the entire minutes of the meeting, although we will have a tape available for anybody who wishes to listen to it, a verbatim tape in the central office. We can make arrangements for that, but we cannot,unfortunately, make arrangements to reproduce those tapes and send them to everyone. That would be a prodigious job. If the minutes do not satisfy your needs, then communicate with my office so that you can listen to the tape here in the central office would be possible.

I would like to talk to you about where we are. Our resolve to solve this problem has only been intensified. There have been some additional activities that have been undertaken which I will endeavor to call to your attention momentarily. The evidence mounts up on both sides of the issues.

I would like again to reiterate our conviction that veterans who are suffering the long term effects of herbicide exposure are being examined and if treatment

is needed they will be treated at VA hospitals without the necessity for establishing causation or indeed any linkage.

This is a reflection of our general policy to treat ailing veterans regardless of the cost whether it be service connected or not and should they require hospitalization, they will be so hospitalized and treated.

The adjudication process for compensation to people who believe themselves to be the victims of untoward effects because of exposure as a process which does require either the establishment of a causal link between exposure and subsequent ill effects, or a common time frame. If it can be established that the origin of the symptoms and disabilities a veteran now suffers, if the origin of those symptoms or disabilities can be established through a period during which the veteran was in active service, the causation is deemed to be established.

In other words, if it happened to him while he was in service, if there were abnormal pathophysiological signs or symptoms which can be established to have begun during his service period, the causation is assumed to be present, and we would then proceed to grant this individual service connection.

With that information, let me just say that we

have had continued recourse to the Press in various ways a number of articles have appeared, an interview in a recent issue of Science Magazine that I have had on the Health Related Effects of Exposure to Herbicides, in a recent issue of Science, the official journal of the AAMNA Association for the Advancement of Science; an interview with the New York Times; several interviews on the television and radio by myself and others have occurred.

Our administrator is absolutely delighted to the idea that the Veterans Administration will help to solve this issue; and indeed other branches of government, as you will hear in this today have redoubled their efforts to help solve this vexing problem of the health related effects of herbicides.

I would like to call to your attention a number of activities which have taken place. We as you know, continue to refer to the Armed Forces Institute of Pathology, specimens which are required during the course of normal diagnostic procedures, and the Armed Forces Institute of Pathology codifying these and retaining these.

In other words, if we get a sample of tissue from an individual who was exposed to Agent Orange we are sending these to the Armed Forces Institute of

Pathology for their further study and classification. The obvious intent here is to be able to form a tissue bank so that if we subsequently discover any tissue abnormalities which are in common that we can go back and re-examine all those tissues that we have acquired and sent to the Armed Forces Institute of Pathology to see whether they show these pathologic changes.

In a number of cases I have in hand a letter from the Armed Forces Institute of Pathology to the director of our pathology service, dated August 15, 1979, in which Captain Coward, Director of the Armed Forces Institute of Pathology acknowledges receipt of these tissues and details their examinations, a number of tissues from the VA, but from other armed forces hospitals as well, from Willford Hall Hospital in Texas and from the Great Lakes Medical Center in Illinois. So that is going on, and we expect to have further dialogue with the Armed Forces Institute of Pathology about this.

Secondly, we have undertaken to code as you know, our circulars to require now that hospitals which are collecting information about, VA hospitals, about applications to them for treatment and diagnosis of disabilities incurred in connection with exposure to health related effects; those hospitals are required

to send us quarterly detailed reports of those examinations including the medical history, the physical examination, and the laboratory examinations that were performed. We are now in the process of coding that which is a very laborious time consuming procedure. And we have had special people detailed into the central office from our field hospitals to help us do this.

Dr. Levinson will undoubtedly have more to say about that when he gives you the report of the Steering Committee.

Later this week we will have a meeting of the responsible physicials at the various VA hospitals who have been assigned the task of coordinating the field activities entailed in investigating the alleged harmful effects of herbicides at VA hospitals. At every VA hospital a physician has been designated in some instances there is more than one, to be the center point of information about this problem. And we have, as I have indicated to you in the past, made it a point to inform these individuals, these physicians, about the information we have. Circulars prepared by Dr. Schepers and Dr. Castellot and Dr. Levinson, myself, and other agents in the central office informing these physicians about what is going on have been prepared and issued to the field. Hotline telephone conversations

with them have occurred in the past.

We are later this week going to have the first conference in which all of these physicians will be brought together. And the purpose of this conference is two-fold. First of all, to instruct them in the latest developments of what we have undertaken, and what is going on in the field to keep them informed of what is going on. And secondly, to have them share with us their experiences and their suggestions, ideas, and elaboration of problems they face in trying to deal with this. We hope that there will be recourse to some of the Advisory Committee to their knowledge at this meeting some of them will be addressing the group. Other experts as well and representatives of some of the Veterans organizations have been invited to address the group as well. So we hope that much good will come out of this conference, the first of its kind ever held in which we can share with these individuals who are bearing the burden of the responsibility at the field level on what is going on.

So a number of things have happened and we are pursuing a number of other investigations. We have engaged the services of an outstanding epidemiologist in the Veterans Administration-- Let me correct that, who is not in the Veterans Administration, but the VA has

engaged the services of Dr. Williams of the Johns Hopkins University, who is an outstanding epidemiologist to consult with us and give us advice, which we will hope will guide us in the right direction.

Other efforts have been made, and you will hear more from our group today.

At about 11:00 o'clock we will begin the discussion of the position papers which were prepared in response to questions posed by the VA Steering Committee. And hopefully, these will eliminate the problem. I must emphasize that these position papers are not in the final stage of preparation yet. We are going to have to do more work on them and hopefully the discussion that we will be able to have here will help us complete that process.

I think that launches us, and I think without further ado then, I am five minutes late, I will turn to the report of VA Steering Committee's activities. And I would ask Dr. Levinson to come up and talk with us about this.

DR. LEVINSON: Thank you very much. I am glad once again to be able to address this group concerning the activities of the VA Central Office Advisory Committee. You remember from my last discussion with you that the Advisory Committee is intended to coordinate the

activities of the entire VA Agency with regard to Agent Orange and its attendant problems. And within the time allotted to us today I will try to introduce most of the people involved in the committee so that you can see the range and scope of activities in which we engaged.

Just to review it in slightly more detail some of the things that Dr. Haber has already mentioned, so far we have received reports on 3100 veterans who have been examined in our hospitals under our Agent Orange program. The next set of reports is due within a week and we expect substantially more will have been included in this group.

Remember that these are veterans in the VA patient population who served during the Vietnam War from the period between 1962 and 1970, and who agreed to participate in our program. We have not yet gone to outreach although that may follow at some later point.

The information that we have received in my opinion, has been quite good. We are endeavoring to improve the format in which it is collected and we will be engaged in that process in the near future.

In the meantime, we have devised a coding sheet which will allow us to make the next big step in this process to computerize the information so that it can be readily studied and so thatwe can follow the

veterans who have been entered into the study.

As Dr. Haber mentioned we are using this as the basis for a potential expansion into a full fledged epidemiological study of these veterans; and I think that we have laid the groundwork for a successful study.

The Agent Orange Conference also was mentioned. A number of members of the Advisory Committee will participate as speakers, and I thank them for that in advance. We will also have a number of other people from the outside who will be addressing the group on various aspects of attempting to draw connection between Agent Orange exposure and subsequent illness.

We have set up or are in the process of setting up a formal process liaison with all the other federal agencies that are concerned with the study of Agent Orange. Thus far, we have been attempting to follow most closely the activities of the Air Force and their proposed study on the ranch-hand group, but over the next several weeks and months we will establish hopefully, an equally firm liaison with each of the other appropriate federal agencies, and if indicated will expand our attempts at liaison to other groups.

We have made further progress in our study of, pilot study, of levels of dioxine in humans, and we will have Dr. Lee report on that in a minute.

Mr. Pecharsky is a member of our committee

from the Department of Veterans Benefits and is not here today; but speaking for him, I would report to you that there have been 650 claims filed thus far under that program. One has been alluded as being validly connected with Agent Orange exposure. It was a patient with chloracne. Nineteen others have received compensation but the Agent Orange exposure was considered incidental to the process for which they were connected. So the number of new people applying for compensation has not very much increased since the time of our last meeting.

We continue to work with the Department of Defense on attempting to correlate data on spraying in Vietnam with troop movements. And this has been a very cumbersome and difficult process, but an essential one if we are to complete an epidemiological study. We will hear more about these efforts. They are proceeding but slowly and with some difficulty, not because of lack of cooperation but because of the complexities of the process.

I might introduce some of the other members so that they can briefly bring you up to date on some of the specific areas that they are involved in. I might mention before I do this that the minutes of the Advisory Committee are always typed and duplicated.

They are sent out to quite a list of people, apparently they contain information of interest. And I want to let you know that they are available if you should want to see them, both the current minutes as well as the older ones from the last 8 or 9 meetings -- I am sorry -- the Steering Committee. If I said Advisory, I was wrong, Steering, that I represent.

Let me call first on Dr. Lyndon Lee to bring us up to date on the fat biopsy study.

DR. LEE: It is well known this is a segment of a series of commitments that the VA has made to the Congress and to the public in order to see if we can't deliniate some of the problems in this Agent Orange exposure.

At the present time we have fat biopsies on 34 total volunteers. Twenty of those are study cases, 11 are controls, and 3 are volunteers from the active Air Force who had had 1,000 or more documented hours of exposure to Agent Orange. Of that 34 biopsies taken, 21 have been reported by the chemist and 13 are presently in process by the chemist in order to give us an assay by his mass spectometry techniques. It has been our thought that perhaps because we are working in the levels of one part per trillion it might be well to have some kind of parallel assessments and this is being worked out

with the EPA. We have sent them a randomized sample of those 34 people -- in fact, 8 of those who have been exposed. That randomized sample is broken into exposed people, those who have had no exposure but are controls, and we have substituted in that also a known sample which is with known zero exposure in dioxine and one we have purposely contaminated in order to check on EPA's use of different techniques from the mass spectometry.

At the same time we have asked our DVB people to go back in their records and in the military records and see if they can verify for us what exposures may have been experienced by the people who were, in fact, study cases. All we have is the word of these people that they were exposed and when and how much and so forth. We would like to double check that with DVB if we can. That is not a simple process.

We are also attempting to augment the information from the records both in the hospital and from the material which are coming in here to the Central Office to give us as much as we can get on both laboratory and on individual histories, physical findings and so forth. A paper has been drafted in order to report all of this. It has been circulated to the investigators. It needs now the chemist's statement of his techniques, his

processing, his means of reporting and that sort of thing. And it needs in addition, the analysis by the National Research Council's biostatistical participant before we can finish it.

We plan a meeting of all of these investigators including the chemist and the statistician in Chicago, sometime in October, probably at the time of the College of Surgeons Conference, because the majority of investigators will be there anyway, and that will make it a less expensive process. And sometime in the week of 21-26 October at that meeting we will discuss the various reports. We will break the code from the chemist and see what it looks like from the standpoint of each of the investigators and see if we can't bring that report to final form. And we will make that available for publication for this group as soon as we can.

DR. LEVINSON: Dr. Lawrence Hobson spoke to you last time about the VA's research considerations in this area. Dr. Hobson, do you have anything further to add?

DR. HOBSON: There is very little more to add. Protocols are attempting to be developed using the veterans who are exposed to Agent Orange in order to study the immunological effects. Principally the difficulties are ones that were reported before and are reviewed each time this is mentioned; namely documentation of actual

exposure is extremely difficult. And secondly, there has been a long time lapse in exposure to other substances in the interval so thatit is difficult to say who has a significant exposure, who had a significant exposure and who did not get exposed to other agents that might have had a similar or somewhat complicating effect.

DR. LEVINSON: Margaret Kilduff, from our Medical Administration Section, would like to show you some of the progress that we have made on the coding of our charts.

MS. KILDUFF: Dr. Haber and Dr. Levinson have said the data collection at our field facilities started in our medical records in May of '78. We started the quarterly reporting into Central Office in September of '78. We have about 3,000 of those reports in, and we have had about 7 people in for abstracting the information.

On the data items that were designed, we have devised a code sheet which I would like to distribute to the members of the Advisory Committee. And this is based on the information that we gave to our field facilities and we are slowly abstracting this information. It is as Dr. Levinson says a laborious process. We hope to be finished within another month if possible.

The data elements may be changed. They are under subject to review at the present time.

DR. LEVINSON: Thank you very much.

MS. KILDUFF: That is our present status on the registry at the present time.

DR. LEVINSON: Additional copies can be made available if anyone feels the need for them. I wonder if Dr. John Castellot could say a few words about some special considerations he wants to present to the committee.

DR. CASTELLOT: My comments will be directed toward a more personal vein, if you will. Medical service in the Central Office has something to do with this people problem and one of our responsibilities is preparing replies to a great deal of the correspondence that comes in concerning Agent Orange. Fortunately, we don't handle all of it but a significant share of it.

Two of the replies from the Central Office contain comments to the effect that the individual problems cited in the letters would be brought to this committee's attention. In one case, this was made as a result of a specific request from the Congressman sending in the letter. In a second case, the Central Office responded, felt this was appropriate. So I would like very briefly to recount these cases with privacy being protected.

In the letter from the Congressman, the person involved, of course, was a veteran and he and his wife

are having significant marital difficulties, and the individual himself is having problems of a physical nature with skin rash and other things. I won't go into specific details because I don't think it is appropriate, but the Congressman did indicate specifically that this matter would be brought to this committee's attention.

I should point out this is just a representative of many letters that we get along the similar vein. And these, of course, will be included, many of them people have already been included in the registry. This veteran is included in our registry.

The second letter has another veteran who is also in the registry whose child was born with a series of congenital deformities involving the upper extremities. This particular case was also called to your attention for the reason I mentioned, but it is representative of several of a similar nature that have reached our office.

As I said, these two and others will have been recorded in the registry for appropriate analysis later. Thank you.

DR. LEVINSON: I neglected to mention Dr. Castellot --

DR. MOORE: Could I interrupt?

DR. LEVINSON: Sure.

DR. MOORE: I am puzzled by the last presentation. I thank you for the knowledge -- to state indeed in compliance with the congressman--I am bringing this to your attention and give us a 15 second dissertation as to what that was all about; and sitting down suggesting to me that you are trying to meet the letter of the request, and I am not sure what the spirit of the request was. I am just puzzled.

DR. LEVINSON: This was presented and will be passed out for your review and discussion later. They will be given to you. We are not trying to short circuit the discussion.

Dr. Castellot is Director of Medical Service in the VA Central Office.

Let's call on Mr. William Doneld Howell of Management Support Services to tell us about his liaison with the Department of Defense regarding the spore spraying tapes and military unit history.

MR. HOWELL: Dr. Levinson indicated I am from the Office of Management Services. We have overall responsibility for records management policies and procedures in VA. We also have responsibility for liaison with the Department of Defense and other interested government agencies for the exchange of records and information necessary to ensure that the VA Department

and staff offices have all the information they need to provide full service and benefits to our veterans.

Better than a year ago, we became involved with obtaining information from military service records of veterans claiming exposure to herbicides. It became quickly apparent to us that we were going to need specific information from the Department of Defense and military services, their official personnel records, if veterans claiming exposure to herbicides were to receive proper consideration of their claims.

We needed particularly information as to location of areas that were sprayed in Vietnam, dates spraying missions occurred, dimensions of the areas sprayed, and military units if any that were in those sprayed areas.

We contacted the Deputy Undersecretary of Defense for Research and Engineering to ask them for the specific information. In response to this request they provided us computer printouts and tapes that had been prepared by the National Academy of Sciences. These tapes identified the locations of and the dates of herbicide missions flown in Vietnam. They also identified the type of agent sprayed,the area covered, and the amount of material sprayed.

After we received these tapes and computer

printouts we then went to the various history centers for history within the military services and asked them for information on histories of units in Vietnam. These we have obtained.

We are also continuing to assist the Steering Committee members in obtaining information from specific military records, personnel records, for instance in Dr. Lee's case, he had 11 people that we researched at the National Personnel Records Center for him.

DR. LEVINSON: One of the problems, of course, is that records gathered for one purpose in this case military troop movements and spraying are not necessarily adaptable readily to different purposes, such as epidemiological study. And this is one of the great problems that we face in our future efforts.

Let me call upon Mr. Fred Conway to describe briefly some of the areas in which the General Counsel, whom he represents, is involved in this process.

MR. CONWAY: Thank you. Primarily, we are involved with two cases, two litigation cases that are, one is in New York and the other is in Washington. They are in the process of the preliminary stages of development right now, one of which is a class action suit brought about by Paul Reutersham and the others who are claiming disabilities without exposure to herbicides. In that

case the Veterans Administration is not a named party as a defendant, but rather would be a beneficiary of any action that is successful, in that the chemical companies who are the named defendants would be responsible for paying the VA, if successful, for the compensation and treatment that we will be providing these individuals.

The other action is an action brought against the Veterans Administration alleging that we have not complied with certain kinds of procedures in development of our policies and our procedures in handling the claims. Both cases, as I say, are still in the preliminary stages. We are nowhere near resolution of them, and no one knows what the outcome will be on those.

Another matter, we have had frequent contact with Congress and we are trying to work with the Department of Justice on other matters relating to development of a compensation scheme if necessary, that would handle this kind of a problem in the future if it should arise in other areas. But we are mainly concerned with the Agent Orange problem, and identifying individuals who may have been exposed and devising a system that will adequately and fairly compensate them if the results of this meeting suggest that a cause and effect relationship exists.

DR. LEVINSON: Thank you.

Let me call on Dr. McGolnan, who is Deputy Director of Pathology SErvices to give us any update on the AFIP registry.

DR. McGOLNAN: Dr. Haber has already alluded to the activity of the Armed Forces Pathology, AFIP. This registry was established in September 28, 29, 1978, and provides all pathological material, that is, surgical, etiologic, or other similar tissue from veterans with possible exposure to herbicides, will be examined and reported in a customary manner at each medical facility.

In addition, a duplicate set of slides, blocks and representative tissue will be forwarded promptly to the AFIP for inclusion in the special registry.

At the AFIP each case is evaluated, diagnosed and report of findings sent to the contributor. Cumulative reports are sent to the VA Central Office each month, listing the cases by name, the material submitted, the diagnoses and copies of the report which were sent to each of the contributors.

This demographic patholotical data on each case is coded into two systems. The registry is the TERMATRIX system and AFIP computer. When an adequate number of cases have been gathered from this pathological information, it will be integrated with other studies clinical -- clinical laboratories, statistical and

epidemiologic.

Of particular interest are the following unusual or unique tumors occurring in any organ or organ system; unusually high incidence of a tumor for a particular site, a tumor occurring at an unusually young age, a cluster of similar cases in a particular military unit.

As of July '79, 13 cases had been registered and reported. Of these 7 were surgical, 5 were autopsies and one seminal fluid.

We have other details on this but this is a general summary of the information. Thank you.

DR. LEVINSON: I would like to introduce Dr. Robert Love from our Operations Branch. Dr. Love, thank you.

And then last but by no means least, Mr. Alex Cutter. Alex has been very helpful in arranging for our conference which is a large and complex undertaking. He and Dr. Castellot have joined me in planning it and I certainly owe him a debt of thanks for whatever success is achieved.

I think this gives you an indication of the scope of activities of the Steering Committee, and our goal is to make coherent the policy alternatives for the Veterans Administration in facing the various challenges of Agent Orange and to undertake certain activities as assigned which are within our scope of expertise.

Another thing thatwe have done, you will see, this afternoon is we have prepared four additional questions in addition tothe 13 you have, which we feel the agencies, which we feel the agency requires an answer in order to better understand the Agent Orange situation.

I would like to clarify before finishing one thing. I do have available in my office past and present minutes of the Sterring Committee and will make them available in case anyone wants them.

DR. HABER: O.K. Thank you very much, Dr. Levinson. I think at this juncture I would like to throw the floor open to questions and comments about the reports of the various Steering Committee members to engage your attention to them. I think I will begin with the question you raised, Dr. Moore, and we will make available to the members of the Advisory Committee the details of those two particular cases. It is a question of privacy here that we have to consider; but I think Dr. Castellot understood our obligation to let the Advisory Committee know about this. These cases may be illustrative, and I think the Advisory Committee needs to consider them divorced from identification of the individuals; but there are principles involved which we would like to get your guidance from. And I think your questioning was right on target; and since my packet held those I assumed

everybody had them. It turns out I was given information which was not generally true. It will be included.

Are there any comments from members of the Advisory Committee or from the attending group about the reports of the Steering Committee?

DR. MOORE: Could I request copies of future minutes of the Steering Committee as well as any past minutes. I think it would help me and maybe the rest of the group tremendously to have something in front of us to give us a better sense as to what the VA is about.

DR. HABER: Dr. Levinson, would you please see to it that minutes of the Steering Committee are henceforth included in the packets for the Advisory Committee.

DR. MOORE: On your veterans examination that you described in which you have 3100 people that you have received into the Central Office, is it possible to receive a copy of the format that is being used on these people?

DR. LEVINSON: Yes. The format was, the current format at which does badly need revision, was submitted to us last time as part of a circular. What is the number--we will have it in a minute. I haven't committed it to memory yet. It is 19-79-83, which was dated April 16,1979. You all received this last time. If you want additional

copies we have it available.

In the back of that circular -- there is three attachments which are the format of the examination. The first part is the initial data base which goes into the history of exposure and we try through various means to get both quantitative and qualitative data about where, how long and so on. This is an extremely difficult matter.

The second part, Part B, goes over the, is a review of systems basically from a historical point of view of areas in which it has been said by inference or by direct information toxic effects of Agent Orange might manifest itself.

The third part is a physical examination form which again urges emphasis on certain particular areas. In addition, we encourage appropriate laboratory testing to the extent that the findings on either history or physical examination indicate. We don't have a set format but we do have certain suggested guidelines.

Now this will be revised to more adequately answer the questions regarding epidemiology that we need to have answered. It will be put in a more appropriate form, and will contain coding information so that the hospitals can code it directly and there won't be a lag between the performance of the examination and the

entry of this data into our computer system. We are being advised in this revision process by the epidemiological forces of Johns Hopkins and others, and also hopefully from the members of this committee, so that we can have a truly excellent form.

There are additional copies available if anyone wants them.

DR. MOORE: Could I have a copy of that too, please.

MS. KILDUFF: This form follows the data elements that he just explained.

DR. LEVINSON: I will bring copies this afternoon for everyone.

DR. MOORE: Of the 650 claims that it was stated that one has been allowed, I think it would be very beneficial to me if I could get some information as to what were the symptomologies or the pattern of exposure associated with the person or apparently led the VA to conclude that it likely was an Agent Orange exposure.

DR. LEVINSON: The basis of it, the gentleman who represented DVB is not here today. The basis of it was chloracne. It was on that basis that the claim was granted.

DR. MOORE: Did he have any other symptoms -- liver pathology or neurologic problems?

DR. LEVINSON: I don't know.

DR. MURPHY: What about exposure? Does he fit the pattern of heavy exposure or was that taken into consideration at all?

DR. LEVINSON: I am sorry, I just don't know. We will have to find out.

DR. HABER: The information is that he does not fit the pattern of heavy exposure and what we will do is to get a trace of that case insofar as we can without violating the Privacy Act, which gives you the background. I think it would be illustrative and I think the whole committee would benefit from that.

Do all the members of the Advisory Committee have a copy now of the coding elements? This will enable us to get the information in the protocol for the examination coded and developed so that it is suitable for automation. The numbers of examinations is mounting. We would like to be able to reduce it to a format which we can deal with in large numbers.

DR. MURPHY: Related to Dr. Moore's question, of those 3100 veterans in which we have received reports, it wasn't clear to me just how this 3100 happened to have been selected other than they agreed to participate. And specifically, does it include reports from the 650 claims,people that have filed claims?

DR. LEVINSON: The 3100, these are not selected except to the extent they agreed to participate, self selection. These are people who are receiving service in our hospitals, and who were Vietnam veterans, serving during the period of time when Agent Orange was utilized. These people are identified by Medical Administration Service and they are invited to participate in the study.

I do not know the number invited who declined, but these are people who have agreed to participate. So to that extent there is a self selection process.

This does not reflect at this moment outreach, advertising, come in and so on, nothing like that.

DR. MURPHY: My other question was how many of those 650 people are involved?

DR. LEVINSON: I don't know. But we have inferences that not all of the people who have filed claims for compensation have been examined under this program. As you may know in our system they are two separate processes. One files claims with one part of the agency, Department of Veterans Benefits, for compensation. One receives health care from another part of the agency, the Department of Medicine and Surgery. The two do interact on parts of the processing of claims, but having filed with DVB is not tantamount to being examined in a VA health care facility.

DR. HABER: Anybody who files with DVB if he manifests it, he must invariably do so, some current physical or mental problems associated with this, he would be referred to the Veterans Hospital Department of Medicine and Surgery for treatment, diagnosis and treatment.

DR. MURPHY: The invitations, you said they were invited to participate. What is the basis of the invitations, was it exposure?

DR. LEVINSON: No.

DR. MURPHY: Symptoms?

DR. LEVINSON: The basis is that they were Vietnam veterans during that era, and that they believe they were exposed. On that basis alone we invited them to participate.

DR. MURPHY: O.K.

DR. HABER: The invitation is really a self-generated one.

DR. MURPHY: That is right if they believe they were exposed, then that is kind of a self selection process.

DR. LEVINSON: Yes.

DR. HABER: I hope there was no inference drawn to the contrary.

DR. ERICKSON: What is the comparison going to

be made to? What is the control group, this group of 3100 people?

DR. LEVINSON: We don't have a study yet. We are in the process of using this data to develop a study and we felt that the best way to start was to begin collecting data untilthe study was designed, which is completed as quickly as possible and to place the names of the people in our computer so they can call back for additional studies when the full dimensions of the epidemiological study have been outlined. At the time when we do undertake it, there will certainly have to be an appropriate control group and several are available. The most logical one would be Vietnam era veterans who did not go to Vietnam, presumably they were not so exposed. But there are a number of control groups that we can use, the general population, for example, would be available to us.

DR. HABER: Could you identify yourself from the floor?

MR. DeYOUNG: My name is Ron DeYoung. I appeared here today as a representative of the National Veterans Task Force on Agent Orange. I had a question for the gentleman from the Office of Management and Services but I would like to hold that just for a second. The information that the task force has developed is

directly counter to your last statement, Dr. Levinson, in terms of that control group. And I would caution you that we have reports from veterans that indicate that the Panama Canal Zone, Fort Lewis, Washington, Aschaffenburg, along with possibly Subic Bay in the Philippines were defoliated. These are eye witness agents. We don't know the exact chemical. It was either 2,4,5-T, or a mixture thereof. It was stated by them it was a very common construction technique for the engineer batallions at that time.

DR. HABER: Mr. DeYoung, we are aware of that and we understand that the use of herbicides exposures--even the civilian population, so it will be difficult to find a match group. We will do so, however.

MR. DEYOUNG: I wanted to make that a matter of record because of Dr. Levinson's last statement. The question that I really rose for was a question to the gentleman from the Office of Management and Services. You are talking about computer tapes and locations of units and so forth. Have you yet had a successful track on any veterans? Has DOD or one of the departments come back and said, yes, this man was exposed, here are the particulars.

MR. HOWELL: No, I can't really answer that. We just get the information for the Department of

Veterans Benefits. Now we obtained it for them.

DR. LEVINSON: We have not asked them to track individual veterans as yet. We are trying to get the whole process done as it were, automatically, if it is possible. We want to get the data together so that we can do it by the use of a computer.

The agencies, of course, do track individual veterans when required. They do this apparently as we understand, as a matter of routine, and may very well have done so for the claims filed before the Department of Veterans Benefits.

I can't answer that but for the purposes of our activities, we have not yet tracked individual people. We are storing the data and we hope we can avoid having them laboriously follow some. We hope the use of the information when automated will obviate this. This is what we are aiming for.

DR. HABER: Actually, there are several tracks that we are pursuing to try to run down that very important question.

MR. DEYOUNG: What bothers me is the implication, that I would suggest that you relook at what the adjudicators are sending out to veterans in terms of requesting the veterans to develop his own documentation for exposure to the herbicide. The evidence, I will give

you as close to a quote as I can--the evidence of record does not contain information which shows you were associated with herbicides; therefore we must deny your claim at this point.

That is not word for word but the theme is very much what the adjudicators at local levels are putting out to veterans who are writing.

DR. HABER: Yes. I think your point is well taken. We will be communicating with DVB.

MR. DEYOUNG: I think it might be better for the veterans to know that something is going on here in terms of documenting that exposure than just thrusting it back upon their shoulders, which they have no resources to do.

DR. HABER: The point is well taken.

MR. ENSIGN: I am with Citizens Soldiers Veterans, New York City. I want to try to pin down something. I am a little confused. It is the question of the April 16th memo, and the relationship to the veterans coming into the facility. And I am trying to understand. We, of course, hear from a lot of veterans. We routinely ask them if and we generally read right from the memo and ask them about these questions -- were you asked this, asked that.--and I must say that without being hyperopic -- most veterans say no, I was not asked that. I was not

asked those questions either in specific or in the general.

Now I realize that often a guy might not remember. There may be people whose memories are faulty but it seems as though facilities in many cases are not asking that set of questions. Now what I am trying to understand is, is it because when the person comes in, and he makes the claim, he goes into the regional office and makes the claim, is there some process whereby that person must satisfy themselves that he, in fact, shows something which then entitles him to be questioned or is it, in fact, routine that anyone who comes in and says, I believe I was exposed, they will be. Is it your statement of policy that the VA will ask them that set of questions. And if that is a statement, I have to say that from hundreds of guys we talked to it does not seem to be filtering down to the regional level.

DR. HABER: Let me answer that question that we have heard that statement made by several individuals such as yourself. One of the purposes in having our conference later this week is precisely to deal with that issue.

Dr. Levinson stated it appropriately. The two processes applying for compensation, adjudication for service connection, and or the process of applying for medical care, medical benefits, are independent in the

sense that one does not have to wait on the other. And that a veteran who comes to a hospital or a clinic of the Department of Medicine and Surgery alleging ill effects will be treated in accordance with the circular that Dr. Levinson cited. Those questions will be asked.

The appropriate physical and laboratory examinations will be done. Where that does not occur, it is important to find out why it has not occurred, and we will endeavor to get remedial action. Sometimes as you say, it may have occurred without the veterans being specifically aware that it has occurred.

MR. UHL: My name is Michael Uhl. I have a question for Dr. Levinson. With reference to your epidemiological study that you mentioned a few minutes ago, I have two questions actually. Who will design the study and will you have the benefit of the advice of this committee or some other outside committee of experts on this?

DR. LEVINSON: Yes. The design would surely -- since we are not in our agency we don't do epidemiology on a large extent at this time, the design would surely come from the outside. And very definitely it would take into account the advice and guidance of this Advisory Committee.

MR. UHL: Who will do that study?

DR. LEVINSON: I can't answer that now. Currently we are talking to people from the Department of epidemiology at Johns Hopkins. Whether they are the ones that are chosen will depend on their availability and on the circumstances. It will be, though, a highly reputable outside group that is not otherwise involved in this.

MR. UHL: What will be the mechanism for involving the Advisory Committee in the construction, design, evaluation?

DR. LEVINSON: Several. First of all, already in the questions that they have received and for which they are developing position papers we have many aspects, facets of this epidemiological study under their review.

Now that hasn't been pulled together but there are specific aspects that they are already commenting on. Presumably, they would not presumably, but I am sure certainly they would be asked to comment on the design after it is completed and to approve every aspect of it before we finalize it. So I think they would have an oversight and a significant role in the final approval of the design.

MR. UHL: Thank you.

DR. HABER: Let me say something about the epidemiology. One of the things we want to do and one of

the reasons this committee was so constituted is that it is not possible for the Veterans Administration to do the total epidemiology. It is not appropriate. It is not possible. So on that what part of the epidemiology we will be doing will be the result of a number of kinds of advice, some from a group such as this but also from the members around this table; because, obviously, some of the other federal agencies are already engaged in epidemiological studies. As a matter of fact, all of them around here are engaged in studies of one kind or another. And it will be our function to see to it that those which the VA undertakes are those which are appropriate for us.

We won't be trying to duplicate what the CDC is doing, or what EPA is doing or the Department of Agriculture is doing. So that in the reason for the structure of this Advisory Committee was to be able to be an interchange clearing house for all the kinds of studies which need to be done. Some would be appropriate for us to do some for the Department of Defense. Some for NIEHS and the function of this committee will be to advise us on what kind of epidemiology we ought to be involved in.

Were there questions?

MR. LENHAM: Mine was asked.

DR. HALPERIN: I am Bill Halperin, a physician in epidemiology at the National Institute for Occupational Safety and Health, and I am filling in for Dr. Lemen who couldn't be here today. So you will have to excuse me if I missed some of the points.

We have heard that there are going to be epidemiology consultants to design this study; but yet we have been told that there are already 3100 people somehow enrolled in a data system that looks very elaborately developed. And quite honestly my palms start to sweat.

It seems to me that if there is going to be an epidemiologic study done by the VA it ought to be clearly defined by whoever does it with their protocol reviewed before data systems that are developed may in a sense not be appropriate for the kinds of study that they want to develop.

I think it would be reasonable to stop refraining from, to start refraining from discussing the 3100 in this data system as a study, and make the plea that as soon as possible that we have a chance to review the actual study design that the consultant will come up with.

DR. HABER: Let me be quite clear. This may have been confused. We have a clinical problem right now that does not await the appropriate design of the definitive study. We have veterans out there who have

clinical problems, may have clinical problems. We have to react to that now. We cannot afford the luxury of discouraging those veterans until our study protocol is developed.

What we are attempting to do now is simply to collect that data which seems to us to be inherent in the problem, and which having been retrieved will give us at least a starting point. And we are going to codify that data.

That is not to superimpose upon the design of the study any restraints at all. We are just trying to capture the data ways available. It may well be that we will have to go back and ask those veterans to return and to subject themselves to additional studies once the protocol for the epidemiology has been decided upon. And we are prepared to do that, and we expect that most veterans would be willing to do that. But I think what we are doing now is reacting to a clinical problem and sure knowledge that some of that will be useful in an epidemiological study. Some of it will not.

Some essential element of an epidemiologic study will not have been gathered in this and this will await the definitive protocol; but you know as we do, that elaboration of that protocol is going to be a very tedious, exacting process. And we simply cannot afford to

wait until that time has happened when veterans are literally at our doors asking for help. So we are mindful of your concerns and I assure you that the epidemiologic study will attend to the considerations you have elaborated.

Are there any other questions or comments?

MR. HIGHT: Henry Hight, I am with the Board of Veterans Appeals. I might make one comment here to this gentleman over here that even if the regional office adjudicators do not question the veteran properly on where he has been, what and so forth, we are remanding those cases for full development. And they won't get by without having all of the development that the veteran can give us, and that we can make as far as determining whether he was there and what kind of situation he was in, whether he was sprayed or not and so forth.

There is one other point I would like to bring up here, and it seems to me that some discussion has gone along on the basis of chloracne. And as I understand it, the existing of chrloacne in service is not a manifestation of other than that acute manifestation of having been -- we will admit that he has been sprayed. This is not a pathological symptom which we will say is related to something later on. Is that correct, Dr. Haber?

DR. HABER: What our attitude has been about the

existence of chloracne, either at the time of service or very shortly thereafter, if the individual was shortly discharged would be that that is evidence of the fact that he has been sprayed.

MR. HIGHT: He has been sprayed but not that he has something now years later that is related to service?

DR. HABER: If there are problems, current problems that the individual has and he has well documented evidence of chloracne that would be indicative of the fact there might be a connection.

MR. HIGHT: Certainly gives them the evidence of having been sprayed.

DR. HABER: Right.

MR. HIGHT: Thank you.

MR. JAMISON: Terry Jamison, a reporter for U.S. Medicine. The VA has announced previously that a study of human fat tissues would be concluded this summer. If that is the study on which Dr. Lee was reporting, it is apparently behind if we are talking about late October. But what can be said about the two-thirds of the samples that have been completed by the chemist? Is there any indication?

DR. HABER: No. The code has not been broken until the samples are completed. We cannot give you any information.

MR. JAMISON: That is the same study?

DR. HABER: Yes.

DR. LEE: I would like to add there was no commitment as to when that study would be completed and there has not yet been any commitment.

DR. HABER: We have time for two more questions and then we must proceed. But if there are other questions if you would please submit them in writing we will see that you get answers.

MR. DeYOUNG: I would submit first of all, the last statement that there have been commitments made possibly not by the Central Office but to individual veterans, in Chicago they were submitted to a three month response time. The time has passed and they are wanting their results. They also want to know why they can't get theirs because the whole program is not done. They don't understand the code hasn't been broken yet.

I will try to explain that to them, but I don't think it will sit well. My major concern is the Air Force Study. The HEW Study, the Ranch-Hand Study. There was a major announcement last time there was a major epidemiological study on a thousand to two thousand veterans of the Air Force ranch-hand program.

The most recent news we got through the news media, the study has been postponed a few months. The

protocol is still not yet available. What is going on?

I asked some specific questions. Has the Department of Defense developed a protocol for that study and if not, why not?

The second one, has the Department of Defense sent it to the White House, and if not, why not? When will it be sent?

In both cases, when will it be done? What is the time table for this project? When can we expect some start and some finish?

DR. MOORE: Dr. Haber, could I ask a clarification? Do you infer the ranch-hands was an HEW, Air Force study?

MR. DEYOUNG: That was my understanding, Dr. Moore. I had understood the actual development of the epidemiology would be done by HEW.

DR. MOORE: I am not aware of that. Are you aware of that?

DR. HALPERIN: No.

MR. DEYOUNG: Totally Air Force?

DR. HABER: With the exception of the fact, and I will let Major Brown speak to this, that another agency, the NAS, I believe, was invited to review the protocol but it is an Air Force study.

MAJOR BROWN: Would you go back and restate your

questions! The first one, we will answer that and proceed from there.

MR. DEYOUNG: Has the protocol been developed by DOD?

MAJOR BROWN: The Air Force has developed a protocol and it is under review.

MR. DEYOUNG: By who?

MAJOR BROWN: We have had three groups now review the protocol and we are now in the process of having the fourth group review the protocol.

MR. DEYOUNG: Could I have the names of those groups please?

MAJOR BROWN: Surely. I brought a copy of it. There is a Memo for Correspondents. I brought it today to give to the committee, dated September 17th. Would you like me to read it?

DR. HABER: Please.

MAJOR BROWN: "The United States Air Force announced today the revised schedule for the initial implementation of its study of the health of 'Ranch Hand' personnel who sprayed herbicide orange in Vietnam.

Operation Ranch Hand was a name attached to the AF spraying program in Vietnam between 1962-1971. 'Ranch Hand' personnel would have been the most likely Vietnam veterans to have had significant exposure to the herbicide.

The purpose of the study is to determine if any causal relationship can be established between exposure to the herbicide and changes in the long-term health status of the individuals involved.

The initial phase of the study was scheduled to begin in early October 1979, following completion of an extensive scientific peer review of the medical protocol by several scientific groups. This peer review, which began in June 1979, is not being completed as quickly as originally estimated. It now appears that the initial phase of the study may not begin until January 1980. The medical protocol constitutes the scientific approach by which the Air Force plans to conduct the study.

Three scientific groups have reviewed the protocol -- the University of Texas Medical School at Houston, The Air Force Scientific Advisory Board and the Armed Forces Epidemiological Board. A fourth scientific group, the National Academy of Sciences, currently has the protocol under consideration.

Upon completion of the reviews, the Air Force will meet with the Veterans Administration Advisory Committee on Health-Related Affects of Herbicides to discuss the entire study."

If you would like a copy of that, you can obtain it from the Air Force Office of Information in the Pentagon,

Major Doug Kenneth.

MR. DEYOUNG: Thank you.

MAJOR BROWN: You are welcome.

DR. HABER: Can I interrupt the questions.

Mr. Wisniewski, would it be appropriate either now or sometime this afternoon to give us some of the information about that case that was adjudicated as being due to service in Vietnam at the time the Agent Orange was being sprayed? Do you remember the one case that has been service connected either now or if you need some time?

MR. WISNIEWSKI: It depends on how much data you need. The one case that we did allow as probably due to Agent Orange was a chloracne case and it had a diagnosis of possible, I think, chloracne and we resolved that by holding that it was due to Agent Orange. Although the file itself had no direct proof of exposure to Agent Orange. We did it solely on the basis of this statement of the veteran himself that he was in Vietnam, and that he was exposed to the defoliants.

DR. HABER: We have promised the Advisory Committee a blurb on that. Could you undertake to develop one with some of the particulars about this so that we can put it in their folder?

MR. WISNIEWSKI: I certainly can and will do so, but when do you have to have it?

DR. HABER: Sometime in the next week or so.

MR. WISNIEWSKI: Certainly. You will probably have it by the end of today or tomorrow.

DR. HABER: I think Dr. Murphy had one question and can we close it with you?

DR. MURPHY: This had to do with an earlier question and an earlier comment, and I don't recall whose comment, stating that the position, I believe, for compensation had related evidence to support compensation was one of cause and effect or concurrence in time, and that symptoms since and signs developed within the time that exposure might have occurred.

And I wondered if this ten rules out any delayed chronic effects in terms of this?

DR. HABER: No. What we are saying is if an individual receives a disability as a result of enemy action, he has a gunshot wound, that is established. Then, of course, that becomes service connected or if an individual develops an illness at the time that he is in service, suppose he begins to show the first signs of leukemia we cannot ascribe the casuation of leukemia to service yet.

If his leukemia began while in service and the first abnormality occurred at that time he would be granted service connection.

DR. MURPHY: In other words, you are saying if, for example, an individual were washing machine gun parts with benzene in 1970 and were discharged in 1971 and in 1978 got leukemia this could not be associated?

DR. HABER: No. I am not saying that.

DR. MURPHY: That is what you just said.

DR. HABER: I said the clear indication, that would have to be established but if he developed signs and symptoms of any disease while he was in service, that would be service connected or if the clear result of it, the approximate result of that was a disability, for whatever, if he fell off a motorcycle, while he was carrying dispatches or as a result of enemy action he was injured, he would be granted service connection.

It does not rule out the possibility that there are long term latent effects. Those have to be established but it doesn't rule them out. What it does is rules in the other two kinds of things. O.K.

DR. BRICK: Not a question, just a comment and an observation. With reference to the report that appeared in the June, July issue of this year of the Federal of American Science Public Interest report, in which they reported that a Vietnamese scientist spoke on dioxine at their meeting that they held on May 9th at the FAS, which is up the street, on the possible

relationship between dioxine and liver cancer, is your committee aware of this?

DR. LEVINSON: Dr. Tung.

DR. HABER: We had him here too.

DR. BRICK: I wasn't aware of that.

DR. HABER: As a matter of fact, we have some observations made as a result of his visit and we can make that available to the committee.

DR. BRICK: I think that might be helpful because he concluded apparently by stating that the relationship was not established between cancer and dioxine, but thought his research suggested it.

DR. LEVINSON: I think we may even have a tape of his presentation.

DR. HABER: We will make that available to the committee. I think the group should know Dr. Brick was forthcoming enough, I believe that is the word, to write to the editor of the Post regarding an editorial that the Post published about responsibility for the research in agent orange. And I thought it was very useful that you did bring them at least in our viewpoint. We are indebted to you for so doing, and I think for calling attention to the existence of this committee which we found very useful.

I think we ought to make that letter available

to the committee too.

DR. BRICK: That is all right with me.

KB-1

DR. GROSS: I am Dr. Gross. I am replacing Dr. Griffith here who I understand will no longer be attending meetings of the Committee. He is leaving the Service, going to Florida for a couple of years.

My question has to do with the Agent Orange. Does the Department of Defense have information from the manufacturer or samples of whatever was sprayed in Vietnam at the time?

I understand the levels of dioxin vary a great deal. Now is that going to be handled, the matter of exposure?

CHAIRMAN HABER: Mr. Brown, can I ask you to comment?

MAJOR BROWN: I think this afternoon Major Young will address the various levels that the Air Force is aware of in terms of the concentrations of dioxin contaminant as to how that will exactly be handled in the future, and perhaps be a VA decision.

CHAIRMAN HABER: Okay. We are 15 minutes overtime on this issue, and I would like to thank the Committee for their comments and so on, and I would like now to go into a discussion of the position papers.

Hopefully without seeming to impose on it we have the position papers developed. I would say this is not the definitive form in which they will appear. These

position papers were the first cut, and I think they need to be refined further. I want to take these up for discussion with the group and it will be my policy, what we will do is ask the discussant, the coordinator to discuss it, and to then throw it open for discussion.

Based then upon these, the comments and questions from the audience and the other members of the Advisory Council, we will undertake to go further in the process of refining these papers, and then hopefully to get them in a more definitive shape, and so Dr. Halperin, would it be fair to ask you to lead off a discussion for the first paper, if you could give a quick summary and your own komments on it, we will throw it open to discussion.

I hope we are not catching you unaware.

DR. HALPERIN: No. Dr. Lemen asked me if you could clarify the difference between coordinators and contributors? Have contributors partaken in the draft paper so far?

DR. HABER: To my knowledge, well, I can't answer that question. Do you know?

MS. WILLIAMS: I don't know, Doctor. These were expressed desires, to have input and participate in the preparation and the coordination. I don't know.

DR. CASTELLOT: We don't have any specific information. The individual people were instructed to,

as I understand it, as I recall, contact the other people or the other people could contact the coordinator, either way, but to my knowledge, I can't tell whether this was done in any specific case.

CHAIRMAN HABER: The coordinator was charged with the responsibility of filing the paper. At the time we made these assignments, I instructed the other members of the Committee to contribute if they had the desire, and these names represent that group.

DR. HALPERIN: He wanted me to say he hadn't discussed his paper with any of the contributors nor had he contributed to any of the other papers where he was listed as a contributor.

CHAIRMAN HABER: All right.

DR. HALPERIN: The question that was asked was could one do a valuable epidemiologic study of the Vietnam veterans to try to answer the very pressing question concerning illnesses that were coming up in that group and their possible exposures in Vietname.

Basically the way Mr. Lemen addressed this question was by saying that it was certainly a valuable and important thing to try to do that. It would require a great deal of information that we do not know at this point whether it exists or not, and we personally have no access to knowing whether it exists or not.

You can see he says whether any or all of this information is available lies in the knowledge of the Department of Defense and the Veterans Administration, but if the information did exist, that it may be possible to do a meaningful study, so really he has answered your question with a question which is before we say whether there can be an epidemiologic study, one that would be valid and meaningful, we have to know specifically what kind of information is pertinent to do that kind of study and what he addressed in his paper was the general kind of information that may be necessary.

CHAIRMAN HABER: The only thing we can say is that we need to get back to our own members of the Advisory Committee to be able to take this up with the others who were respondents for this in the hopes that they could produce a more significant answer to this question than appears to be the case.

DR. HALPERIN: I don't think that kind of further discussion is really what is needed, in my opinion. If Dr. Lemen's draft position paper could perhaps be given to a staff person to answer specifically whether this information exists and what the character of the information is, then as an epidemiologist he could evaluate that information and say whether it could be, what could be made of it.

CHAIRMAN HALPERIN: We would then endeavor to make that available. I am going to be called away for a moment. Dr. Schepers, will you hold up for me? Excuse me. There is an urgent summons I have.

DR. MURPHY: Doctor, may I ask Dr. Halperin a question?

DR. SCHEPERS: Yes.

DR. MURPHY: I don't know if this is what was intended or if it is the typing, but it says before drawing meaningful--the third paragraph, "Before drawing meaningful conclusions about the mortality experience..." is only mortality intended, or is it morbidity and mortality?

DR. HALPERIN: His first emphasis was on mortality. Morbidity and reproductive are even more difficult to answer, as he addressed in his draft position paper, because the data is all the more difficult to get ahold of, that is, there is only one definitive piece of paper that is needed to define mortality experience, and that is a death certificate.

Morbidity and reproductive, he had no information available to him as far as what kind of information is available concerning veterans in the United States, and it really is a much more difficult question.

DR. MURPHY: I understand--just because it is the first thing that is addressed without these introductory

comments--

DR. HALPERIN: I think he goes on, "Additionally, studies of morbidity and reproductive effects among the exposed population of veterans can be conducted if medical records for the exposed and non-exposed populations of veterans and their families can be reviewed for the years subsequent to service in Vietnam"

He goes on in more detail. I think the real question is to answer this, one needs to know what data one can work with.

DR. SCHEPERS: Could I clarify a little? There are two types of veterans--those who come to the Veterans Administration and those who don't. The majority do not come to see us. Generally the veterans who come to see us are older men, and there are specific reasons for that which I don't need to go into, so it is very likely that the majority of the Vietnam veterans do not yet come to see us.

Any epidemiological studies should take cognizance of that difference because the health problem which may be related to Agent Orange exposure could be presiding amongst those we never see rather than the ones that we do see.

Secondly, to start with mortality for this particular group would be unusual because they are young

people, and we do have very accurate mortality records pertaining to veterans who do come to see us, but we don't know anything about veterans who die outside of VA hospitals.

DR. HOBSON: We have very good records of those who die because of the benefits that are paid at the time of death to veterans.

They have not been calculated for the Vietnam veterans, but the follow-up agency of the National Research Council feels that we know of 95 to 98 percent of the deaths that occur among World War II and Korean War veterans, probably as high a number among the Vietnam veterans.

DR. SCHEPERS: Would that apply to the Vietnam veterans, too?

DR. HOBSON: So far as anyone knows, because the death benefit is paid. Usually they say the second question that is asked by the undertaker is, is he a veteran.

DR. SCHEPERS. That is very useful.

DR. HOBSON: So we do have very good mortality records, and that probably was the reason Mr. Lemen included that.

While I have the floor for a moment, I would like to point out that in the position paper question that was sent out, the first sheet that is here, the quotation that 4.2 million veterans reportedly may have been exposed, I

think this is the inversion of those figures that occurred sometime back. It should be 2.4, and I think the correction should be made.

It is also I am afraid in Dr. Brick's letter a little farther on, too. This error was made early on I understand, but it is an error.

DR. SCHEPERS: It is purely a typographical error, and it has survived through this document, so we will correct it at this point.

Thank you, Doctor. Any further discussion of this proposed position paper? Is it agreed then that the word "morbidity" should be included?

DR. MURPHY: Well, I don't know. I understood Dr. Halperin's clarification. I personally feel that for someone who isn't privy to this discussion, reading this, it might give the impression that the only concern was with mortality or the big major concern, because this leads into, it says mortality.

It does not introduce, as you did, Dr. Halperin, the fact that there are two ways of looking, or there are at least two aspects of it. It is just a matter of I think a little introductory sentence, but I would accept mortality as being a valid and measurable end point.

DR. HALPERIN: It is certainly valid, and Mr. Lemen has said that studies of this may be able to be done,

but you have got to understand he is a very pragmatic fellow and what he is really saying here is not to quibble with emphasis. It is all important, as you are saying. The only way to answer whether it can be done is to know what kind of information exists, and he is not privy to that knowledge and therefore really can't answer the question.

DR. MURPHY: I understand that, too.

DR. HALPERIN: If anything functional is to come out of this position paper, No. 1, it is that we have to come up with a mechanism to get from the staff to the Advisory Committee some description of specifically what kind of information does exist.

DR. SCHEPERS: May I ask Ms. Kilduff whether she knows how many Vietnam War veterans have died? Do you have that figure?

MS. KILDUFF: I imagine we could get it for you, but I don't have it right now.

DR. SCHEPERS: Would it be obtainable today?

MS. KILDUFF: I will try.

DR. SCHEPERS: Then we would know how many we are talking about for the mortality figure. If it is only 200, it is a very small study. If it is 50,000, it is a very large study.

DR. MURPHY: But the record could be talking about prospective as well in this implication of this paper.

I don't seem to be able to make my point to either of you, so maybe it isn't important.

My only question is when I read this and when I would assume that others who might read this hadn't heard this discussion, they would have the same reaction I did when I got to the third paragraph, and it says, first starts talking about drawing conclusions, it refers to mortality, and they would have the reaction my God, is that all they are concerned about is mortality?

Now I am saying is that,the introductory statement that Dr. Halperin has outlined today, would that be inserted before that? That would take care of my concern because he points out mortality studies, current and prospective, have value, but you need a certain kind of information for them to be valid, and then goes on to cover other, something less than mortality, i.e., various morbidity studies, and that is what I am appealing for.

DR. HOBSON: No. I think if it starts off with a sentence at the start of that paragraph it would be all right.

DR. MOORE: I think the answer to a question might have relevance to this. The question is that earlier today we heard that, well, first of all, we are aware of one thing. That is the prospective study within DOD which is the Air Force's study on Operation Roundup which we will

hear more about this afternoon.

Secondly, with regard to exposure information, it was stated earlier that the response to a request to DOD, they gave tapes that essentially were similar tapes that had been prepared for the National Academy of Sciences Committee on the Effects of Herbicides in Vietnam, but what I lack is that my sense is that the majority of veterans who are making claims are not Air Force but indeed are Marines and Army, and if that is the case, the information that DOD has provided gives no indication at all with regard to troop movements or troop concentrations in relation to the Air Force information which has been provided as to where they sprayed and when they sprayed, and that is the type of information I do think that Dr. Lemen was really saying unless we can have that, you can't really design a study. Until you have the data, you can't decide whether you can or you can't.

DR. SCHEPERS: Is all this clear to everybody? It is not yet clear to me.

MR. LENHAM: Your point is well taken. Just for information purposes, I know in our legislative headquarters alone, Operation Ranch Hand I believe is going to be doing a study on 1200--

MAJOR BROWN: Approximately 1200 individuals that were part of that operation.

MR. LENHAM: Just in inquiries alone in how to go about filing claims, and what have you, in our legislative headquarters we have received over 1300, just here in our Washington headquarters, 1300 responses from veterans indicating some sort of a problem that they feel is related to exposure to the herbicide, not saying that all of these are valid, but this is what we are looking at, so you know this is vast over the country. This is going to be multiplied quite a bit, so your point is well taken as far as looking intothe troops in the field.

DR. SCHEPERS: Just for clarification, in case it needs clarification, Operation Ranch Hand is the preogative of the Department of Defense because these are employees of the Department of Defense. They are not yet veterans. We can't study them until they become veterans, so this is their baby, not our problem.

MR. LENHAM: Right. I understand that.

DR. SCHEPERS: The 1300 you are referring to are Ranch Handers?

MR. LENHAM: No. I am referring to the 1300 Marine, Army personnel, what have you, veterans. I am referring specifically to veterans that have inquired into our legislative headquarters expressing concern that they have either medical problems that they now have and they feel are related to their exposure to the herbicide, or

13

medical problems that their children now have which they feel might have a co-relationship with any herbicide exposure.

MR. ENSIGN: Could I make a point and share a bit of information? I talked with Jack Spay, who is President of the Ranch Hand Association, and his estimate was that no more than 10 percent, possibly 15 percent of the 1200 population are today presently on active duty, so we are not talking about people that are active duty Air Force personnel today.

We are talking about people, 85 percent, probably 90 percent are veterans, so just logically it does follow, you must conduct that within the branch in which they were on active duty. You are talking about a veteran.

DR. SCHEPERS: We have no problem with that. We have come across one or two individuals who have claimed to us that they were Ranch Handers and are now ill. We have also received letters from other Ranch Handers who emphatically deny that they are ill and claim that those who complain are not experiencing the same thing as they are experiencing.

We can study those Ranch Handers once they have left the service of the Department of Defense, and they are very welcome. We are looking for them, so if you know of them, if you have their names and addresses, let us

14

know. We will track them down because we are quite interested in that group.

Any further questions?

DR. LEVINSON: Let's go back to the information. I forgot who asked the questions about the tapes. The material we are obtaining from the Department of Defense is not the material that NAS had. It had data on spraying. We have that information. The information that we are attempting to gather from the Department of Defense also includes troop movements which NAS did not have, so if it is available, that is a very difficult quest, we will have that information.

We will, however, also use the tapes, the spraying tapes which NAS used in its earlier report and attempt to correlate the two separate bodies of information.

We are aware, we have estimates from all of the services of the gross numbers of people who might be exposed, and this is as close as you can come, gross numbers, because exposure is very difficult to define and we are aware of the number of people in the Army, the Navy, Marines and Air Force who might have this exposure.

The Ranch Hand group is of particular interest as far as we understand because of the fact that we can in many of these cases quantitate or come close to quantitating exposure, so this is why it is a particularly

15

valuable group for study.

As far as the Air Force versus the VA, the Air Force wanted to do the study. They felt they were prepared to do it, and I think since they have gone quite far in developing the protocol, it is very appropriate they continue and I know from the Surgeon General that they are very eager to continue at this point.

MR. GOLINKER: You stated that you had received from the service the estimate of the gross number of people who were exposed.

Could you tell us what that number is, please?

DR. LEVINSON: No. It changes every day.

MR. GOLINKER: Are we in the hundreds of thousands?

DR. LEVINSON: Yes. It is certainly less than the 2.4 million. The current rough estimate that we have is somewhere around 500,000, but this is a very rough approximate estimate. It depends strictly on how you define exposure.

MR. GOLINKER: Do you know when the military services will be able to, have you asked for a deadline as to when their search of their records on troop movements would be provided?

DR. LEVINSON: No, we haven't asked for a deadline because it appears to be a very complex and cumbersome

process. The unit histories, because of war-time conditions, as we understand it, are only partially complete and the process of searching out this data up to this point is a matter of manual rather than a machine type of operation, so we remain in negotiation with them about how this data and if the data can be gathered, and we do not as yet have a deadline as to when they will be available.

MR. GOLINKER: Thank you.

MR. DE YOUNG: The study of Ranch Handers looking for effects of herbicides strikes me as analgous to a study of bombardiers looking for the effects of high explosives. You don't look at the people who drop the weapon. You look at the people upon whom the weapon was used, and I really have trouble with that study for that very reason.

I would second Mr. Lenham's comments earlier that we are getting calls from the grunts and from the dogfaces who were down in the mud, who were drinking contaminated water, eating contaminated food, who were sleeping in contaminated jungles and so on and so forth, and had literally a 24-hour existence with these chemicals at some point.

I will grant you it is harder to document in terms of dosage levels, but I end this with a question. By what logic and what facts do you include the Ranch Handers

17

as a good target population? Are you certain of how they were exposed and for the hours they were exposed?

DR. SCHEPERS. It is really Major Brown's preogative to comment on that, but we first discovered about the Ranch Hand group about a year ago, and seized upon this group as being a group of military staff whose exposure to the material Agent Orange could be very clearly defined.

There is no argument about it that these people lived in their planes, ate off their planes, drank water in their planes, sloshed the stuff all over themselves when they were dedrumming, which is one of the new words we discovered, pouring it into their planes, and they were spraying, and some of them were spraying, were following other planes that had just been spraying and riding right into the mist, so there is no argument in my mind that these people were exposed, and therefore if they have symptoms, their symptoms might elucidate this problem.

By focusing on the Ranch Hand, we did not at all try not to focus on the man on whom the material was sprayed, but earlier today there was some discussion as to whether we know precisely where the men were, when the spray planes went over. You have just given the answer in that you said they slept in the stuff. They ate the stuff. They drank the water, so if the spraying took place on the top

of a hill and the men were down in a valley which was not sprayed, they could still have been exposed through the water they drank, so we essentially are going from the base that anybody who was in Vietnam at the time when spraying took place could have encountered Agent Orange or dioxin in some form.

MR. UHL: I would like to address a question to Major Brown. How many pilots were there in Ranch Hand and how many flight engineers or ground personnel in this 1200 population?

MAJOR BROWN: Well, I can't answer that question for you exactly. We do know that the aircraft that was primarily used, in fact only used, which was the C-123, had three crew members in it. Two of them sat in the cockpit and one in the aft section.

MR. UHL: Are you including the ground personnel in this study?

MAJOR BROWN: They will be considered.

MR. UHL: But they are not the Ranch Hands?

MAJOR BROWN: If they were actually assigned to the Ranch Hand organization;in the early years there were some people that were taken in or asked or ordered, whatever you want to call it, to come dedrum material and load the aircraft. Those people were not assigned.

They may have been cooks. They may have been

19

aircraft mechanics. Those people were not assigned to the organization itself, even when they were TDY.

MR. UHL: Do you have a breakdown now somewhere back in your office, if not with you, or some other place of the number of pilots versus the number of flight engineers versus the number of people who were assigned to Ranch Hand who may have been handling personnel or other personnel within this 1200 population? Does that exist as far as you know?

MAJOR BROWN: I don't know.

MR. UHL: It seems like we are dealing with a relatively small population.

LT. COL. WOLFE: We are developing that list right now. At the St. Louis records repository we are looking for anyone,using multiple eata sources to identify 100 percent, ascertain every last possible person that was ever permanently assigned to our Ranch Hand unit.

MR. UHL: You cannot begin your study until you have that population fully identified by name, address, et cetera, and occupation?

MAJOR BROWN: That is correct.

MR. UHL: Which will be done by January, 1980?

MAJOR BROWN: That's right. We now have approximately 1150 names of individuals. We are now in the process of validating those names, and that is what Colonel

Wolfe was referring to.

MR. UHL: I just have one comment concerning the study which I would like to make, which is I think that we have to look at the quality of exposure very definitely. I think it is a very valid study becuse we have talked to many handlers and many flight personnel who obviously worked the machinery who are in fact exposed all the time. Pilots, many pilots we talked to were exposed, but less so than the other people, the people who actually handled the herbicides or actually did the spraying,working the machinery.

On the other hand, there is another division I think that has to be made between the quality of exposure among this population and the quality of exposure which I think Dr. Schepers has already referred to, in the other populations, the ground personnel, or people in Saigon who may have eaten the kind of shell fish that Dr. Nesselson brought back and found dioxin present in.

DR. SCHEPERS: Is there any further discussion?

DR. GROSS: Just a question, sir--this epidemiologic study that is discussed in Mr. Lemen's thing, what do we have in mind? Do we have in mind a prospective study or a retrospective study because the two are vastly different. It would require vastly different numbers of subjects, controlled and exposed I think, or perhaps both

21

kinds of studies are contemplated?

DR. SCHEPERS: It was my impression that we wished to do the retrospective study first and then on the basis of what we learned from that proceed to a prospective.

Is there any difference?

DR. LEVINSON: No.

DR. SCHEPERS: First the retrospective and then the prospective.

DR. HALPERIN: Until one has adequate information about exposure of individuals and adequate information about outcome, that is their mortality, morbidity and reproductive effects, it is hard to pre-determine what kind of study one is able to do.

DR. GROSS: You need the exposure information.

DR. HALPERIN: For both of them; the question is what is there? What can be gotten out of it?

DR. SCHEPERS: Shall we go through the debate on question one and proceed to question 2? This is for Dr. Brick. You were the coordinator of question 2, which was what are the best human population grous in which to study the long-term effects of herbicides on health and how may these studies best be conducted?

DR. BRICK: It is very difficult to me as a non-epidemiologist to pick out the best populations to study,

and of course the discussion we have just had indicates among the experts here that it is difficult, without knowing the exact amounts of exposure, et cetera.

The information about 2.4 rather than 4.2 million, we are talking about this group of veterans who were allegedly exposed to Agent Orange, and I don't have any idea as to what would be the best groups to study.

Now in Mr. Lemen's proposal he says the one final end point that can be studied is mortality. Obviously most of us have other interests than mortality. Most of us have interest in morbidity, and apparently that is the sticking point, which groups can be studied for morbidity? How are you going to pick out these groups is going to be difficult to decide, too.

Now in the prelininary remarks by Dr. Haber he pointed out that there are 3100, there was 3100 veterans who were examined under the Agent Orange program by the Veterans Administration. That is correct, isn't it?

DR. LEVINSON: Yes.

DR. BRICK: These 3100, I don't know what the details of the information relative to exposure is among the 3100. We weren't given that information I believe, but I think to make a start, I think we are going to have to examine, the Veterans Administration is going to have to examine veterans who were in Vietnam during this period

of time and try to determine whether there are any specific morbidity problems in this group as related, for instance, to another group that was mentioned of Vietnam veterans who were not in Vietnam, who were not in Vietnam, that is veterans who served in the services but did not go to Vietnam to see whether there are any differences in the two groups with reference to morbidity as well as mortality I would suppose, and I think, I don't know, I don't think we are going to get exact information from the Defense Department with reference to a massive exposure, so it is a difficult problem with reference to which groups are best to examine, but I think by making a start and trying to examine veterans who were in Vietnam versus veterans in the same period of service who were not in Vietnam possibly some information can be obtained.

DR. GROSS: Sir, I am experiencing an acute sense of discomfort at the thought that since exposure cannot be well documented, we ought to make the exposed population sort of more inclusive as to include the whole range of people who were in Vietnam.

I will tell you why this bothers me. I would be surprised if all the people that were in Vietnam, the military forces, were really exposed to the same extent. There must have been vast proportions who probably were never exposed at all. It is difficult to identify people,

but consider the consequence if in fact there is an association between Agent Orange, dioxins, what have you, and certain health problems by having the category of exposed people be considered so widely as to include unexposed people.

That will tend to dilute or mask the association, and I think there is a clear danger in that. If anything, I would suggest that if we really want to discover this association, we ought to restrict ourselves to the only cases that were well documented that could be certified almost to have been exposed or exposed to fairly high levels. That will make it much more likely for the association to finally emerge than to sort of have it masked in a more amorphous group, which is a large proportion of it would not have been exposed.

DR. BRICK: I would agree with that if we can get exposure data. Now this is the point that Dr. Halperin brought up, Dr. Lemen brought up with reference to whether we can get meaningful exposure data, and the comments of Dr. Moore with reference to troop movements, et cetera, et cetera, and the possible exposure of certain troops at certain times.

If that data were forthcoming, then meaningful groups could be studied. From the conversation that I have heard around the table here, I am not sure that that data is

going to be forthcoming.

Am I hearing correctly or not?

DR. SCHEPERS: It is very difficult. We have a great problem getting that information. Ranch Hand is the closest to getting a group with decisive exposure.

Dr. Haber, we have proceeded to question No. 2 and we are on the topic of what are the best groups to study.

DR. BRICK: I also brought up in that letter that I wrote the possibility that the Department of Agriculture might have some information. I don't know whether they actually do, Dr. Haber, with reference to exposed rural groups because these herbicides have been used in spraying in this country and many others for peaceful purposes rather than for purposes during war time, and I don't know whether the Department of Agriculture has that information on the possible dangers of exposure of herbicides in that type of group.

DR. KEARNEY: I'm afraid we don't have the kind of information that would be helpful in this kind of determination. Largely our surveys are anecdotal with any survey or scientific approach to the subject.

However, we have under contemplation a epidemiology study on exposure to 2, 4-D and 2, 4, 5-T. We have met with CDC, NIOSH, NCI and other organizations and

26 they owe us a report as to the feasibility of doing this. There are problems in this kind of a study. Knowing nothing about it, I can speak with some authority! There are statistical problems that have given us some major concerns, just purely statistics, and until we can resolve ourselves that we would have a valid study, we are awfully reluctant to press the button to initiate that study.

I understand, however, that the National Association of Agricultural Applicators--it is the NAAA, who are the people who provide, it is the National Agricultural Aviation Association, who are the sprayers in this country, have an epidemiology study underway which they are going to look at their own pilots and their own health records and the health records of brothers and sisters and progeny.

Are you aware of this?

DR. BRICK: No, I wasn't aware of that.

DR. KEARNEY: I am told this. That may be a very difficult group because it is an extremely hazardous population and whether one can make any valid conclusion for them, their mortality rate is extremely high because of the nature of the occupation.

CHAIRMAN HABER: Dr. Lingeman?

DR. LINGEMAN: I talked to Dr. Erin Blair who is an epidemiologist at the National Cancer Institute. He

27

told me there are two studies, one of which I think is the one you were talking about, in which 1800 pilots, apparently this same group, and the National Cancer Institute may participate in this study.

The other study that he told me about which might also be applicable here as another population group to study, Dr. Blair is in the process of studying, doing a cohort study of 4,400 structural pest control operators. These are all Florida licensed, and the reason for using the Florida group was that these people have all been licensed since 1965 and have a Social Security Number available for absolute identification. They are licensed annually, and we know how many years their exposure has been. This could be readily documented.

There are seven different groups of these structural pest control operators. For the purposes of our interest, Dr. Blair suggests that perhaps two groups might be of interest, the lawn and garden spraying operators, and those spraying for general household pests.

Now the problem here, of course, is that most exterminators, pest control operators are exposed to multiple compounds, and this will be the problem, separating, but it is possible. It will be possible at leat in some of these people to find out exactly which ones of these were exposed and maybe making some kind of association will

28

be possible.

This study will probably be completed later in this year.

CHAIRMAN HABER: Which study?

DR. LINGEMAN: On the structural pest control operators.

CHAIRMAN HABER: What is a structural pest control operator?

DR. LINGEMAN: An exterminator, Orkin--I don't know.

CHAIRMAN HABER: Like a combustion engineer turns out to be a garbage collector?

DR. LINGEMAN: I believe so, yes.

DR. GROSS: It is one that has to do with structures rather than fields I would suggest.

CHAIRMAN HABER: Dr. Moore?

DR. MOORE: I would think that in responding to this question, I think the first group that you could point out as the best human population in which to study the long-term effects, would be the group that has had the longest exposure, and those are occupational settings that occur starting back in 1949 in which I do know that Dr. Halperin and NIOSH is in the process of trying to establish a registry on those people. To me, that is the first group to start with.

Some of these people had massive exposure, and

29 you have got 30 years post-exposure. That doesn't say that is all one should do, but I think it's a start.

CHAIRMAN HABER: I think that clearly has to be part of our response. That group that has had the longest exposure would be certainly one of the best to study. I can find no fault with that overpowering logic.

DR. MOORE: What that probably won't answer if it is a retrospective type or a study of mortality oriented study, it will not give any information of bringing the information to bear on the allegations of some veterans that indeed they have got children that have problems because it is not just inherent in the design I don't believe.

DR. HALPERIN: Only if there is a prospective part of it attached on.

DR. MURPHY: A related comment, that I think that the occupationally exposed group that can be specifically identified with at least herbicides, and maybe more specifically with those herbicides that are constituents of Agent Orange, ought to be the population or group to focus on.

I would be a little concerned with taking in 1800 or whatever sort of broad spectrum pest control operators and particularly structural pest control operators because I don't think they have exposures usually to the

chemicals that we are concerned about, and secondly, this question of dilution that was mentioned earlier where we start taking in groups of veterans who are not specifically identified with exposure.

We might complicate that dilution problem by taking in a group of people who are indeed exposed to chemicals who indeed might have a set of health injury parameters that are quite apart from those with the group concerned.

I think you have to be careful of just accumulating chemical workers sort of as a group.

DR. LINGEMAN: I am not sure, Dr. Murphy, what you mean by taking in. I am only reporting on a study.

DR. MURPHY: I am not implying that anyone is taking it in, but we are talking about identifying other groups. I am really sort of disagreeing with you with respect to the value of the group that Dr. Blair suggested particularly for this particular purpose.

MR. LARSON: My name is Don Larson, and I am here as an interested individual.

I would like to mention here in regard to long-term programs with the herbicides that have been used elsewhere, it might be particularly useful to go to the records of the Australians and the New Zealanders because they have had aerial spraying, aerial seeding for many,

many years, and with many weeds that would compete with the growing seedlings that would have to be eliminated through whatever means available, so they have used herbicides for many years for those reasons, and their records might be very useful.

CHAIRMAN HABER: That's a good suggestion. I have a note here from Dr. Erickson who is going to have to be leaving this afternoon, and he had the responsibility of discussing question No. 4, and I would like to get your comments on the record, Dr. Erickson. Can we interrupt our normal course of events and move to topic No. 4 so that you can get your statement on the record, and then come back and wrap up?

DR. ERICKSON: Thank you.

CHAIRMAN HABER: I don't know how that will do you the disservice of not getting it in context, but at least we will get your statement.

DR. ERICKSON: Thank you, Dr. Haber. The question which I had responsibility for answering was it is possible kor herbicides to have long-term adverse effects on the male reproductive system, and in summary what I said to that question was yes. That possibility seems to me is the reason we are here, and it seems to me that a more useful question would be do they have an effect or how strong an effect is it, and so far as I am aware, we are in

a state of ignorance with regard to answers to those questions.

Further, in my response to the question, I pointed out that we are learning now that males may contribute to reproductive problems, and that they may do so through exposure to chemicals.

I wound up by saying that there is, of course, a possibility that there is an effect which is of such a small magnitude that we will never be able to detect it, and finished by noting that there are a lot of veterans out there to complain.

Just to make a concrete example, let's say that as a rule of thumb roughly 10 percent of couples are infertile. If all veterans who were in Vietnam are married, that means there are nearly a quarter of a million infertile couples.

Therefore, the complaints of a relative few, the few thousand, really can't tell us much, and it seems to me that the urgent need is more knowing whether these men have a problem in excess in comparison to some appropriate control group which leads me back to lend emphasis to what Dr. Halperin said earlier about the VA study.

It seems to me that the cart is before the horse to a certain extent. There will be a need to decide what it is you are going to use in the way of the control group

33

before you start gathering information.

DR. SCHEPERS. I wonder if I could ask whether we have information, Ms. Kilduff, on the marriage status of all veterans?

MS. KILDUFF: Yes, we do in our patient treatment file, and I believe in the DVB file, too.

DR. SCHEPERS. But only the ones that report to us, but not all veterans?

MS. KILDUFF: Only those in contact with the VA through the DVB or the hospital.

CHAIRMAN HABER: Okay. Is there any comment upon the paper, question No. 4, or upon Dr. Erickson's statement? We will come back after lunch and discuss it in more detail, but I wanted to now ask whether there is any comment about what Dr. Erickson has said.

DR. MOORE: I totally support what Dr. Erickson has put down in writing, and I think it points out the quandry that one faces, and that is this. If indeed there are consequences of Agent Orange exposure and indeed those consequences, reproductive or malformation effects are very modest, the sad state of science today is that you just won't be able to pick them up to such a degree to be able to state there is a cause/effect relationship.

CHAIRMAN HABER: I think I would readily acquiesce. One of the things that makes it so difficult is the quantitative

34

effects may be so slight that they may be lost in a sea of other effects, and that just makes our job that much harder, but clearly we have to find ways of dealing with that so as not to penalize those veterans who may be bothered by this. I think we are going to have to find a statistical way of handling that and translate that into some kind of an action document.

DR. MURPHY: My question is more one of I guess a technical nature for Dr. Erickson who mentioned that we are learning that males can contribute to reproductive problems. Indeed I don't think I ever had any question in that, but specifically I am wondering is there evidence, can injury to the male reproductive system result in malformations in offspring when this injury has occurred sometime in the past?

I know it is possible during the period of spermatogenesis, for example. I don't know how many days or months that would be, but it seems to me that this is a critical kind of a technical question, and certainly the decreased fertility could be permanent and long lasting.

DR. ERICKSON: I don't think I can really answer that question with any authority, but it seems to me there are a few bits of evidence which suggest that yes, it is possible.

For example, one of the suspect paternal effects

which have been suspect for a long time have been an increase in dominant mutations for such things, disorders such as the apara syndrome which occur with increased frequency to older fathers which would sort of lead you to think that it was an accumulation of insults over time which had resulted ultimately in a defective child, so I would guess it is possible, but I don't think there are really any hard data to suggest that it does indeed occur, but I don't think we looked very hard, either.

Downs Syndrome is a really very good example of that. For years we have concentrated on the mother because Downs Syndrome frequency increases remarkably the older the mother gets, and in the last four or five years, we have learned that probably 30 percent of babies with Downs Syndrome have their extra chromosome from the father, that something went wrong in mitosis in the father, yet we have paid no attention to the father for years, so maybe our state of ignorance is because we haven't been looking.

CHAIRMAN HABER: Are there any other comments about this? If not, why don't we adjourn to resume at 1:30, and we will continue then to go through these papers. We will go back to discussion question No. 3, and then further discussion on No. 4.

(Whereupon, at 12:15 p.m., the hearing recessed, to reconvene at 1:30 p.m. the same day.)

36

AFTERNOON SESSION

1:30 p.m.

CHAIRMAN HABER: We would like to reconvene the session from this morning, and there will be a change in the order. I would like to ask the Air Force which has prepared two presentations for us, to go on first, and they will be finished I hope by 2:15, at which point we will then begin to resume the discussion of the papers with a discussion about them.

MAJOR YOUNG: It will take just a few minutes to get the slides ready.

CHAIRMAN HABER: The presentations will be made by Dr. Wolfe and Dr. Young, is that correct? Do you want to introduce them?

MAJOR BROWN: Well, you are going to have Major Young go first?

LT. COL. WOLFE: Yes.

MAJOR BROWN: Al Young is a chemist by training. He has been associated with the herbicide Orange issue for many years. The paper that many of you have, he was the principal author. He has been involved with the problem since his early days in England when he did some of the spray trial work. He is now involved with the Air Force epidemiology study.

Dr. Wolfe is involved with the epidemiological

study and is doing a great deal in learning about the possible clinical side of the issue in terms of what should be done, when it will be done, and how will it be done. Unless someone has questions, I think that is adequate.

CHAIRMAN HABER: Okay. Well then, Dr. Young will go first.

MAJOR BROWN: Yes, sir.

CHAIRMAN HABER: As soon as you are ready.

LT. COL. WOLFE: Why don't I go ahead with mine while Dr. Young is getting all his slides and things together.

I am not sure quite the best way to handle all of this, but I would like to begin to talk briefly about some of the suggested approaches to the evaluation and diagnosis of phenoxy herbicide toxicity in man.

My bias is,if I can call it a bias, is really in two directions. Number one, as a physician, I feel a real need to respond to the medical care needs of the patient, and as an epidemiologist, I feel that any information that we do gather should have applications to answer the basic scientific questions involved in this whole issue.

There are many factors that must be included, must be considered before a diagnostic program can be formulated to assess the adverse health effects that arise from exposures to really any chemical or physical agents.

38

Several of these factors are presented in this slide.

(Showing slides) The time between the exposure and the development of effect, of course, allows us to classify these resultant effects as either acute, subacute, or chronic. There is also the duration of the exposure which can be classified as being acute or chronic. It can also be classified as single exposure and intermittent or continuous, sustained explsure.

The part of the problem here, while we have talked about classical dose response mechanisms a bit this morning where as the dise either increases in duration or in frequency or amount, the effect is also increased in either severity or occurs earlier in the process, there has been some suggestion of a hypothetical of a dose response paradox with the dioxin kind of chemicals in that with a high dose, the toxin would cause cell death, but a low dose would possibly cause aberrations in the cell, abnormalities of one sort or another, but the cell would still survive, and after a prolonged latent period or lag time, subsequent disease would develop.

While this is purely hypothetical at this point, it is interesting sometimes to consider what impact this would have on some of our traditional medical ideas.

This concept of lag time or incubation period is

also quite important in assessing occupational illnesses. This concept is the traditional one when we are talking about development of especially cancer and other malignant problems at later, 15, 20, 25 years later. There is some delay, some confusion and debate in the dioxin issue as to whether these later effects are due to storage of the chemical and then subsequently release with stress or weight loss, other illness at a later period of time, or whether the insult did occur at the time of the exposure and this lag period then was required before the disease manifested itself.

Confounding exposures to other chemicals in the work place or in fact in background levels, exposure to herbicides in lawn fertilizers, lawn herbicides to kill the undesirable weeds in the garden also make it very difficult to attribute adverse health effects to any real specific agent.

Many of the chemicals suspected of being hazardous to health are used in combinations; 2, 4, 5-T was used in combination with 2, 4-D and it also had the industrial contaminant of dioxin. Many of these compounds by themselves are used with dispersants or other contaminants of their own.

The Phenoxy herbicides as they were used in Vietnam created additional problems for us. Again, the

herbicide Orange and its predecessor purple and some of the other herbicides were mixtures of several chemical compounds.

The extremely wide range of effects that are recorded in literature has been a problem. This slide is just a brief summary of some of the multiple effects caused by these chemicals. Many of these symptoms have been attributed to all three, both 2, 4-D and 2, 4, 5-T and dioxin--a lot of overlap. Many of these symptoms and signs are quite subjective in nature. It would be very difficult and they are very difficult to evaluate from a medical standpoint.

The next slide goes into some of the components of this, the asthenic syndrome which has been reported fairly frequently--anxiety, depression, apathy, sleeplessness, emotional instability are very, very difficult to get a real handle on in a physical examination.

There is a real severe lack of clinical, defined clinical end points. The next slide will show a few more of the disorders that have been attributed to phenoxy herbicide toxicity. Again, several of these, cardiac disturbance and some of the renal kidney problems can be detected with ancillary medical procedures, but all in all we are still struck and faced with a fast range of symptomotology.

41

This slide is a brief review and folks here at the VA were kind enough to give us some data on some of the initial claims. This was 361 claims. Of course, they were all male. Mean age was 34, and interestingly enough, there were at least on the average of two symptoms or slightly more per claim.

Sixty-six percent of these were Army veterans; 17 percent as you can see were former Marines; 11 percent had been in the Air Force, and 5 percent were Navy perso-nel.

DR. GROSS: How does that correlate with the actual distribution by corps in Vietnam?

LT. COL. WOLFE: I am not sure of that. This slide, again based on those claims, has broken the signs and symptoms into these basic categories. As you can see, the dermotologic and neuropsychiatric categories make up substantial, are the two primary areas of difficulty that these people had had.

We can now go back to that slide number 3 if I may for just another brief minute or two. The identification of, as was also brought up this morning, populations at rest was, is quite difficult, and verification of their exposure histories is even worse.

Now when it comes to reconstructing the exposure history or trying to quantitate this exposure, we are in a very difficult area, and Major Young will be discussing

42

that to some extent a little later this afternoon.

This factor of identification and verification is probably the major obstacle to any epidemiologic study. In order to reach a valid conclusion, we really need to identify the entire population at risk.

We could do a study on those folks of the 3100 that have identified themselves to the VA as thinking they have problems, but in fact that probably represents a biased group. Those are again a group of veterans that we are aware of and they are also the veterans that, as has been mentioned, have not presented themselves to the VA medical system in any way, shape or form at this point, so these studies are quite difficult.

After consideration of all these factors, there are really three basic approaches that can be used in formulating a plan of attack for the physical examination of individuals who suspected or claimed results of herbicide toxicity.

These approaches essentially fall on a continuum from an examination limited, very limited in scope, limited just to the patient on one end, all the way up to an extremely comprehensive study of the patient, his family, his past history, and generally a social-cultural-medical survey.

The first approach generally would limit

43 itself to an examination of those conditions which are proven or widely recognized to be the result of phenoxy herbicide toxicity. This strategy would essentially limit itself to dermatologic examination only. This approach basica-ly would assume that chloracne is the herald sign of herbacide toxicity, and that other signs of more severe toxicity would not really occur in the absence of chloracne.

This fact may not be true, and there is some very presumptive, very early evidence in some studies that in fact there may be signs of toxicity without chloracne. A lot of this information is being debated and has not been verified at this point, but it is a potential problem.

The second approach is somewhat more comprehensive in nature and would include evaluations of those conditions which while not proven to be associated with herbicide exposures are nevertheless suspected. These include peripheral neuropathy, minor or even more major psychological disturbances, and of coursec disturbances in liver function.

Recent reports from Seveso, Italy are beginning to enlighten some of these areas and there have been some reports out of Seveso concerning the neuropsychiatric problems. It seems as though there is an increase in some neurological kinds of problems--delays in nerve conduction times and a few other sorts of conditions. A more comprehensive approach is indicated not only by the spectrum

44

of illness that has been shown in the veterans' complaints, but also from extrapolation of animal studies. While again extrapolation from animal studies has been described by some people as a wasteland of uncertainty, there is still valuable evidence to be gained from those data that will support the broad range of signs and symptoms that had been recorded.

The third and most comprehensive approach to the evaluation of herbicide toxicity would be an attempt to evaluate the full range of effects that have been attributed to herbicide exposure--assessment of reproductive, immunologic, endocrine systems would probably need to be included in this examination process.

Fertility histories, pregnancy outcomes, and evaluation of family members would be an integral part of this kind of an effort.

The major factors now that would affect the choice of which diagnostic approach that should be used are basically time and manpower. An approach as in No. 3, comprehensive approach, would take a good bit of time to plan and implement. As the comprehensiveness of the program increases, the makeup of the medical specialists involved to conduct that examination would also be a real constraint. There just aren't that many neurologists. I know in the Air Force we don't have an overabundance, and I don't imagine

the VA has an oversupply of neurologists either.

After all these factors have been explored, the basic scientific question still remains--in fact, does exposure to phenoxy herbicides result in adverse health effects?

This decision as to which of these approaches should be used is obviously not an easy one, and an argument can be presented to support either of the three. Perhaps the best solution lies midway along that spectrum between the limited approach and that broad diagnostic net cast by this third approach.

Whatever the choice, again my epidemiologic background is coming through, I think standardized procedures and examination techniques are absolute musts in this kind of an effort, both to assure that every veteran gets the same treatment that he deserves, and other veterans with similar problems also,but also to again gather a data base that can be used to answer this scientific question because we in this room are not the only ones interested in this basic problem.

Standardization of procedures will ensure a maximum degree of comparability between examination facilities. Obviously the best approach would be to use a single center to bring everyone to one specific facility and have the examinations performed by the same group of

46

physicians and paraprofessional personnel. This obviously would be very difficult to do. I don't think anyone would be able to handle the patient load that is expected with this kind of a study.

The only other alternative would be to use multiple centers but with a very clearcut, very well outlined protocol of procedures on how the questions are supposed to be asked, how the procedures should be done.

A thorough general physical examination should be an integral part of evaluation, regardless of the level of complexity that is finally selected--urinalysis, complete blood counts, sedimentation plates, platelet counts, cardiograms, BUP's and creatinines and lipid studies, cholesterols and triglyceride studies should probably be considered as part of this general examination, and chest X-ray or abdominal X-ray may well also be helpful.

The hepatic dysfunction that has been claimed with herbicide exposures can be investigated with any of the usual enzyme procedures, and a battery of several would probably be quite desirable. SGOT's, transpeptide, LDFE's, any number of these enzymes are commonly used and would be quite helpful in evaluations.

Endocrine dysfunctions have also been suggested as being caused by these herbicides, and an evaluation of glucose metabolism and thyroid function would also be

47 important to consider. The dermatologic examination itself should be performed in all three. Obviously all three of these three approaches I have outlined include a dermatologic examination and a detailed search for chloracne and possibly the inclusion of evaluation of porphrine metabolism would also be very useful.

A complete, detailed neurologic exam is almost a necessity. Some of the recent studies, the studies underway at Nitro, West Virginia, Seveso studies, some others have relied heavily on nerve conduction velocity as measures of neurological function to detect early clinical and even subclinical neurological disease, and this may also be a very valuable tool.

The psychological function of these individuals will also be assessed. This athetic syndrome discussed briefly earlier is very difficult to evaluate. Many of these same synptoms are very closely age related. We all age, unfortunately, and many of these things--the fatigue, the boredom with the job, the loss of sex drive--many of these things are obviously age related, and this is a major confounding factor. Only through careful psychological evaluation will these effects be able to be teased out and hopefully be able to be separated from one another.

The reproductive effects which have been claimed, impotence and some of the others, may well be able to be

48 evaluated with a determination of the reproductive hormones. Semen analysis is also a very reasonable procedure, so that can be included to investigate these phenomena of fetatoxic effects--the abnormal birth, the miscarriages, the birth defects.

In the past, most of the literature, most of the scientific work has been based on the effects through the female, but again the studies have just not been performed. In fact, the male may well be able to transmit these conditions either through a chromosomal variation or it has been suggested by some that dioxin may be excreted in the seminal fluid and in turn exert an effect.

These again are hypotheticals that have not been evaluated even in some of the animal studies, and there is a real need for some of this research.

Again, because of this lack of data, it may well be important that in those individuals who have a history of fertility problems or a history of birth defects and their families that the cheomosomal studies may well contribute to this kind of an evaluation effort.

Immunology studies are also, can be useful. In the aftermath of the Sevaso, Italy accident, immunological studies were conducted and so far they have been unable to detect any major effect on the immune system.

However, there are only three or four years now

49 after their accident, and in a few more years maybe some of these immune problems may well surface.

Fat biopsies have also been suggested and this is a difficult area. The procedures are very difficult to do. They are very time consuming. There is a lot of interference with the dioxin determinations by DDT residues, PCW's that are ubiquitous in the environment and likely very ubiquitous in everybody's fat. Everybody sitting in the room probably has some of these contaminants floating around. These contaminants show up in the lab procedures that are now used. The ability to detect the differences between dioxin and these other chemicals, it is a very tedious procedure to perform.

For these reasons, it may be reasonable to include fat biopsies only in those individuals who have exhibited chloracne or other disease conditions that are felt to be more likely due to the herbicide exposure, to use the fat biopsy as a more selective kind of procedure in specific individual cases.

The optimum approach to the clinical evaluation of this herbicide toxicity again lies somewhere down that continuum, and regardless of how comprehensive the examination is to be, I feel it is still a real necessity to develop a standardized program, and above all, to motivate the examining physicians and the other paraprofessionals that

are involved to keep them aware of the problems, and aware of their role in this whole effort.

However, it should be kept in mind that the determination of cause and effect between abnormal health and exposure to phenoxy herbicides cannot be based solely on a clinical evaluation. Cause and effect really needs to await more definitive epidemiology studies based on large numbers of individuals.

The ability to make a cause and effect determination again is based on numbers of people as well as the prevalence of the disease condition you are looking at.

If it is a very rare disease that is hardly ever seen in the normal population, two or three cases in a group of a thousand folks or so would be very meaningful. However, if it is like many of these other conditions that are age related, and they are very common, it may well take studies of 20,000, 30,000 people to detect significant differences in the incidence of heart disease say in a group of Vietnam veterans.

In conclusion, we need to keep in mind that the purpose of a diagnostic evaluation program is not to condemn or defend the use of defoliants in the Vietnam War, but rather to identify adverse health effects in the veteran population and to refer these people to the appropriate

51 medical care and followup that they will need.

The question then becomes have there been, are there currently, and will there be in the reasonably foreseeable future any adverse health effects that can be traced and linked to herbicide exposures?

Thank you very much. Major Young?

MAJOR YOUNG: (Showing slides) My first slide is not mine. What I would like to do is to give you an overview of first Ranch Hand in Vietname. There is a lot of misconceptions going on, and I think this overview will give most of you a good feel for the Ranch Hand program.

It will also give you a good feel for perhaps how many people may have been involved. I have a very short film clip I will show in a few minutes after I give some earlier shots or slides of the Vietnam area.

I would like to talk a little bit then about exposure and give you some parameters that I think are very important for our consideration of an exposure index.

Pacer Ho was the operation that the Air Force was involved in in the destruction of the herbicide. This was 1977, a timeframe when industrial hygiene techniques were available to monitor the herbicide in the air, and all during the dedrum operation and destruction of that herbicide, those industrial hygiene data could be very valuable in exposure in Vietnam, and I am going to bring

52 them up, and then last I am going to talk about the environmental fate of the herbicide and dioxin as we know it today. Someone earlier alluded to the fact that here are these ground troops living in the area that had been sprayed. They touched the plants. They eat the plants. They touch the soil. They live on the soil.

Well, let us talk about how that in fact may relate to exposure from our history of the environmental fate.

I have to preface the use of herbicides in Vietnam with two pictures. Those pictures deal with how phenoxy herbicides have been used in the United States and worldwide and continue to be used throughout most of the world, that is, in this kind of a situation, this is what prompted their use in Vietnam, and it is important we understand that.

This is a right of way, heavily infested with brush. This is the same right of way after two pounds per acre one year later--an excellent technique for removing dense brush, ecologically one that appears to be very sound, and it was that concept then that prompted Maxwell Taylor, General Taylor in 1961 to go to President Kennedy and inquire about the use of defoliants in Vietnam.

With this kind of a perspective, it became very obvious that defoliants could be used in Vietnam to reduce

53 air attacks, and that was the salient reason for why they went to Vietnam, to save American lives.

To that end, in January of 1962 Operation Ranch Hand began. After tests had been conducted to show that defoliation could be carried out with aircraft, that effective defoliation could be obtained, Ranch Hand began then. Initially it consisted of three C-123's. By 1964, the program was considered such a success that six were committed, six C-123's were committed.

By 1965, 12; by 1966, 18; and later in that year, 24 aircraft; by 1967, 36 aircraft were flying Ranch Hand missions.

Initially the crews were assigned TDY, temporary duty to Vietnam. This was the '62 through '64 timeframe. They were gone over for about a four-month period and would come back to the United States. Many of them rotated back and fourth for two or three years.

Beginning in 1965, the program began to have what we call permanently stationed personnel. That is when the large number of Ranch Hand people began to be assigned to Vietnam.

Now Ranch Hand was the name of the squadron, the aerial spray squadron, as well as the operation, and to that end we had about 1200 as our estimate. Now some of these may have been dedrummers. Some may have been mechanics.

54

Many of them were pilots, navigators. They were all members of the Ranch Hand program.

Herbicide was transported to Vietnam in 55 gallon drums. Once in Vietnam, it was transferred by pumps from the 55 gallon drums to these F-6 tankers we call them. They were transported to the aircraft.

I would point out many people believe that Herbicide Orange went to Vietnam in 1972. Not true. Herbicide Orange did not go to Vietnam until 1965. The first use of the phenoxy herbicides in '62 were with materials we call purple, pink and green. That is very important to note because the dioxin concentration of purple, pink and green was far in excess of that or orange, and I will show you some data in a few minutes to elaborate on that.

Likewise, the quantity involved was tremendously different, but so were the number of people that would have been exposed. Recognize that there were very few ground troops in Vietnam in the '62 through '64 era, but after that, the ground troops increased tremendously, so that is something to consider.

The primary dissemination vehicle was the C-123 aircraft. It was outfitted with what we call the internal modular spray system, the AA45Y1, and it is important because we have a tremendous amount of dissemination data

55

for this piece of equipment which may help in the calculation of an exposure indices.

The C-123 is a cargo aircraft, and this is a picture of a new one, very recent--this one from Vietnam, but it is a recent picture. Inside the aircraft there is lots of room, and that AA45Y1 dispenser would just roll right into this then.

In addition, spray booms were outfitted under each wing. There was a 22 foot boom, 16 nozzles per boom, one under each wing, and also one right behind the cargo door.

Now that was the configuration for missions. Let's go on a mission. Here we are in the C-123 in formation. Now because of the few number of aircraft in Vietnam in the '62 through '64 time period, a mission usually consisted of only one or two aircraft, but by 1961 a mission could have as many as 12 aircraft.

In 1966 and '66 because the enemy began to focus on the Ranch Hand aircraft, fighter support was provided and the orange band did not say it was carrying Orange Herbicide but rather it was a Ranch Hand aircraft. It may well have had Orange Herbicide inside of it.

Typically orange was disseminated twice a day in the morning and in the evening. A couple reasons involved there--one, it was nice from a physiological point of view

56

for the plants, for treatment to be given early in the morning because defoliation was much more effective in the morning or in the evening.

Secondly, in terms of tactics, if the aircraft could come in from the direction of the rising sun or the direction of the setting sun, then the enemy would have to look up into that sun to see the aircraft. That would give them perhaps that narrow margin of safety they would need to fly through a targeted area. That does say that there were enemy troops on the ground, enemy troops on the ground.

Here is an early morning dissemination. Typically a single aircraft had a spray about 260 feet. It could spray about 952,000 gallons in 3.5 to 4 minutes. It is a total distance of about 8.7 statute miles. They flew normally about 150 feet off the ground and sometimes when the trees were 100 feet, the aircraft were just above the top of those trees, and they flew about 140 miles per hour.

Here is an aircraft path in an area that had been previously sprayed about a month earlier. Again an important thing to remember was that the defoliation was to remove the vegetation to uncover enemy sites. Now what I am suggesting to you is it would have been very rare to have sprayed our own troops. That would have been a rare event--not that it could not have happened, but defoliation

57

speaks to trying to remove the vegetation so we could uncover enemy cache sites.

For example, in the Mekong Delta after a defolitation mission, about two weeks later as the leaves began to disappear and to fall, a whole boat city was located, over 140 craft all tied together. Then it could be attacked, but we didn't even know it was there before defoliation. That is the point I am trying to make.

Here is an aircraft again, different areas, spraying. Here is a picture of the Ash Valley, three aircraft involved here. Here is a canal that had been sprayed about three months earlier, regrowth in some places beginning to show. Here is a cache site, tunnel network, a whole city built underground uncovered.

Here is a road uncovered. Here is another road, conifer forest, a different application of a different herbicide. This was white, 2, 4-D and picloram. We mentioned the phenoxy herbicide 2, 4-D and 2, 4, 5-T. It appeared in green, in purple and in orange, but we haven't talked about the others.

You see, white was used also, picloram and 2, 4-D; likewise cacodylic acid. To say one was sprayed by aircraft does not necessarily say he was sprayed by Orange. There could have been others. We haven't even talked about insectide missions, and I will show you some of those yet.

58 This continues to complicate that idea of an exposure indices.

Here is a forested area that was sprayed in 1968. This is about half a dozen to eight aircraft wide, well over 8 to 9 miles in length. One of the reasons why the critics began to say ecological damage, the truth of the matter is we sprayed 10 percent of Vietnam. That also says that the likelihood of a troop moving into defoliated areas would have been quite large--another point to consider.

Here is an area that was sprayed for crop destruction. This particular area had been sprayed by blue, cacodylic cid. On your left versis your right--now Ranch Hand squadrons did not include helicopters. The Army, the Navy, the Marines, and the Air Force all had Hughey Aircraft, helicopters that were involved in the spraying of herbicides around base perimeters.

About 120 different spray riggs existed to go into helicopter units. The crews assigned to those helicopter units were not assigned with a specific job of spraying herbicide. It was an incidental job. Therefore, there may be many helicopter crews that were involved in just a few missions. Some may have been involved in many missions.

Interestingly enough, very little Orange was disseminated from helicopters. Most of the helicopter

59 disseminations involved cacodylic acid, and a typical use for cacodylic acid.

This is the hydraul system that fit into the aircraft, and look at the rags wrapped around this. Could exposure to the herbicide have been possible? You bet. Look at this. No question, but here was the big application of herbicides by helicopters. This was for what we call control of elephant grass, a grass that would grow a foot a day and get to be 30, 35 feet tall, and the enemy could come in through that grass right up to the edge of the base, lope over their mortars, and leave. We never saw them coming or going, and hence the use of blue which would brown that within 24 hours. Then it could be burned, but because blue was a contact herbicide, regrowth would occur in just a few weeks and the problem would have to be treated again--a reocurring problem.

Here is an example, though, of Orange being disseminated from a chopper. This is chopper swaths up near the demilitarized zones that were sprayed. This is a swath from a helicopter, B-52 craters on either side.

All Ranch Hand aircraft that sprayed herbicides, all C-123's were camoflaged, but there were also C-123's spraying material that were not camouflaged. These were "the bug birds." These were aircraft that disseminated malathion, and there were hundreds of thousands of gallons

60

of malathion sprayed around wastes, around the edges of the cities prior to battles. It would have been a common thing for troops to say we saw a spray bird come over and spray.

Of course, if that spray bird had been spraying malathion for control of mosquitos, it would have been a common sight throughout much of the combat regions of Vietnam, and as a matter of fact it was a common sight.

The distinction, however, was that it was not a camouflaged aircraft, and even the enemy knew that that aircraft was spraying for the control of vectors, mosquitos, and these aircraft took very few shots as compared to Ranch Hand aircraft.

One of the differences not only in the camouflage, but look at the nozzles under that wing--60 nozzels on that boom, tremendous difference in terms of the particle size that was sprayed.

I alluded to purple, pink and green. That amount of that material used in Vietnam through out procurement records is about 218,000 gallons. It was procured in late 1961. It was delivered to Vietnam in 1962, and no other purchase, green or pink, was ever procured and sent to Vietnam. This was it, a one-time shipment, so the first few years, '62, '63 and '64, had all of that material to spray, just that quantity, and most of that was used along

61

roadways, very small amount of crop destruction involved with that material.

We are going to talk a little bit about the TCDD contents in a couple of minutes. Now beginning in 1965 Orange arrived and Orange was the major herbicide used in Vietnam--a tremendous amount, in excess of 10,600,000 gallons, a tremendous quantity, no doubt about it, but how was it used? Another question we have to ask.

Let me break Orange out. Some people have wanted to see these figures. There is the amount of 2, 4,-D, 2, 4, 5-T, our estimate of dioxin concentration based upon archieve samples of all of the materials. Now it doesn't say it is an exact figure, but we do believe it to be fairly close. That much was probably disseminated on about 3.2 million acres of land in Vietnam.

The inland forest received almost exclusively orange. The mangrove forest received almost exclusively orange. The cultivated crops received amost exclusively blue.

I would like to stop for just a moment and show you a very short film clip of Ranch Hand in Vietnam. We are going to be able to see a lot of indications of why the Ranch Hand population may be our very best population to study because of exposure to herbicides. May I have the film, please?

62

(Showing film) These are your F-6 tankers that were used. Herbicide was transported to the aircraft. Look at the ground. It is covered with herbicide.

These are the nozzels in the tail boom. There were really no nozzel shutoff valves. Personnel do not have gloves on. They are taking the herbicide into the aircraft. Here is one of the valves. Here is a picture of the C-123 at DaNang.

Here is a formation leaving DaNang, one of about three major bases for the Ranch Hand aircraft, on their way to a mission, at least six aircraft probably involved in this one.

Okay. A pilot and a co-pilot, two officers in the front; an enlisted man, the console operator in the back; he is now turning on the AA45Y1. The leader aircraft starts to disseminate. He is flying right into that spray.

Okay. I want to show you this terrain picture on the next shot. You can see the aircraft in line. Here is a good shot of a pilot. Watch as we go over the terrain here. This is a side door that is open, which talks about the effects of the herbicide perhaps coming in that side door. We are going to go beneath that spray. We are passing over a mangrove swamp, by the way. This is a side door that is open--as Bill Curtis called it, the deadly white fog. That is where the connotation comes from, this

62 white cloud.

Okay. End of film; that is a very, very quick shot of disseminating the herbicide in Vietnam.

Let me talk now about exposure. I have given you some factors for your consideration. We believe that there were three groups of personnel exposed to herbicide in Vietnam. The first group we call the Ranch Hand personnel. I have already told you of around 1200. That is the group that the Air Force proposed to focus on.

The second group we call the secondary support personnel, the Army pilots that may have been involved in helicopter spraying, the Navy pilots, even the Marine pilots. There were also people that transported the herbicide say from Saigon out to Beinhoy out to DaNang. Those people transported the herbicide in 55 gallon containers, but we know that in general, there was about .1 percent of those containers that were defective so it probably would not have been uncommon to have a drum leaking and personnel picking that drum up and moving it around.

There were specialized mechanics, electricians, for example, that were assigned towork on various aircraft that may have been in fact not assigned to Ranch Hand but had to work in contaminated aircraft.

There were also during the Tet Offensive situations where every single C-123 available was reconfigured for

63 transport and brought into the operation, so here is a contaminated aircraft that non-Ranch Hand pilots might have flown, so these are all people that may have been exposed, a second group then--how big, we have no idea.

The last group that we could talk about would be those individuals on the ground and there are some scenarios that we could create, individuals that might directly be exposed, sprayed directly by the aircraft, individuals that might have gone into an area that had just been freshly sprayed, or individuals that might have gone into an area weeks or even a month or two months after defolitation operation, so those are the three groups that one might talk about.

How large are those populations? We have talked about the size of the Ranch Hand. This morning we hear the figure 500,000 for the ground troops, but if you suggested about half all the combat troops in Vietnam, all the troops in Vietnam were involved in combat operations, about a million may have been involved in areas that might have been defoliated, but recognize that 10 percent of Vietnam was defoliated. That doesn't say all of Vietnam was defoliated.

There were many bases that did not receive any herbicides of any kind, so that has to be considered.

We believe that for a troop to have fully received

herbicide directly, no canopy involved, just actual herbicide application on top of them, was probably a unique event; that they saw aircraft disseminating herbicide may not have been unique. That they perhaps were involved in being sprayed by a bug bird may not have been unique, but we believe it to have been unique for a Ranch Hand aircraft to have sprayed troops with Orange--might have been some other situations with even blue or white, probably rare for ground troops moving into an area that had just been defoliated, probably a rare event, but much more frequent would have been troops entering into a defoliated area and defolitation usually took anywhere from two weeks to a month to a month and a half, so if we say a month average, that probably was a frequent event.

Now how does one go about preparing calculations on exposure? Well, once you start in this area, you have to begin to speculate. What kind of scenario are we going to set this man up in? Are we going to put him out there with a short-sleeve jacket on, with a helmet on? How do we actually create an actual event?

We don't know all the different ways these people went into the areas, so just speculating what an actual event might have been is very difficult. If we do come up with a value, then how do we take and put it to a meaning? What does it mean? We have no data on no-effect levels. We

65

have some data, but we don'e know what they mean in terms of man. No effect levels for animals perhaps, but for man we just frankly don't know. To say that he received 10 manograms of TCDD per kilogram body weight may have absolutely no meaning. That is the point I am trying to make. I think we could calculate various exposure levels for scenarios, but would that really be an honest evaluation?

You must remember that all of these things change--the size of the individual, the body surface exposed, the route of exposure, inhalation versus these large drops. The mean diameter of a drop of herbicide is 350 microns. That is not a particle that one would inhalate, but what if it begins to volatize so the temperature during the time it was disseminated may be a big factor.

The frequency, how many times did an individual go into that area that had been sprayed? How long was the individual in the area? Was it Orange? Was it white? Was it purple? Was it blue? Was it malathion, and was that herbicide produced back in the 1950's or early 1960's? Did it contain a large amount of dioxin or was it in fact Orange that had perhaps a low dioxin concentration?

Let me elaborate now on the nature of some of these things. Many people do not understand about the herbicide itself. Let's talk a little bit about that. Then we can talk a little bit more about handling and quantity

66

sprayed which we have already alluded to a little.

For example, Orange contains about 8.6 pounds of active ingredient per gallon. It is water insoluble. Had it been sprayed into a pond, most of it would have gone straight to the bottom and been in the silt. Even more important is the insolubility of the dioxin, the vapor pressures. Do you realize that so many other materials, including water, are much more volatile than were the herbicides, and the vapor pressure of TCDD, somewhere around one times ten to the minus 7, suggests that its volatility would have been remote.

Viscous, this talks about the ease of manufacturing--about the same rate as light machine oil. It is non-corrosive to metal, but it was deleterious to boots, particularly neoprene, and that was one of the problems that the Ranch Hand crews had. As they worked around those aircraft, the bottom of their boots got eaten off and that was a constant problem, to renew their boots. Ranch Hand very definitely had a problem in that area.

The material was very stable in terms of a shelf life, and that, too, should be considered.

Now in terms of some of the biological aspects, I will very briefly talk about those. We know that in the case of herbicides, when they are applied to a plant, they are rapidly, rapidly absorbed and generally speaking,

67 they are rapidly metabolized.

In the case of animals, they are readly ingested. Likewise, they are also exereted quite readily, and that should be kept in mind.

Human skin absorption studies that have been conducted suggest that about 6 percent of the applied dose on the skin, and these were forearm studies, was absorbed within the body. This was detected over a five day period using urine excretion data. Toxicity was in terms of LD-50 for rats, both by inhalation and by oral.

MR. GOLINKER: What on?

MAJOR YOUNG: This is on Orange. These are the data I want you to see on dioxin concentration. We have looked at some 488 samples of Orange. These were Orange samples that had been produced probably some of them even to the early dates,the 1965 timeframes, although we don't absolutely know that. We believe they represent that.

These were samples collected over a long time period literally. The mean concentration went from .02 parts per million less than .02 to 15 parts per million.

The weighted mean concentration of Orange we believe to be about 1.98 parts per million, but compare that to purple, material that had been produced much, much earlier, and when you hear people speak of those large values of 47 parts per million, they are really referring

68

to the purple. It has been confused by the press as being part of the Orange inventory. It was separate. It was different. That herbicide went to Vietnam, as I indicated, in January of 1962. No more ever came into Vietnam--in the range from 17 to 47 parts per million in the five archieve samples that we have, 32.8 parts per million mean, so the pre-1965 versus the post-1965 periods may be important in terms of dioxin concentration.

I mentioned to you about how Orange was used specifically, about 90 percent in forest defoliation, 8 percent in crop destruction, and about 2 percent around the base. We will talk a little bit more about the base in a moment.

Here is some application parameters that may be of interest. The speed of the aircraft was about 130 knots; altitude, 150; the tank volume, 1,000 gallons; the spray time, 3.5 to 4 minutes. The mean particle size was about 350 microns, which says it has a volume of about .61 microliters. One could say that if a man had 25 percent of his body exposed, you could take a rough calculation and get a volume that could have hit someone on direct application. It can be done.

A spray swath normally applied at 3 gablons per acre; a single tank would treat about 340 acres at a time. These are the articles on a glass plate from actual

69 missions of Orange from the C-123 under Vietnam conditions.

Here are the chromacoat plates showing you how that particle is disseminated, its uniformity. To give you some idea, someone says that isn't Orange. That is blue. It is Orange. The blue died.

All the drums were marked with a color band around the drum. Inthe early 1962 timeframe, although those drums were marked with a 12 inch band,so it was easier to distinguish '62 from '65 products even if the color of the band had faded; about 50 days in shipping time from the U. S. to Vietnam; about .1 percent of the drums were defective, as I mentioned to you; 85 percent went to Saigon; 35 percent went to DaNang, the two ports that it came in in Vietnam, the drums transported in Ranch Hand squadrons by non-Ranch Hand personnel; transferred then to the F-6 trailers, and the Orange that was used around the base perimeters was Orange obtained from the drippings of the drums.

All the drums after they were initially sucked out by the pump were set up and drained into containers. That was the Orange that was sprayed around the base perimeters.

The drums went primarily to runway and bunker construction, although we are aware that many of the Vietnamese did in fact manage to take drums away from the

70

area where they had been stored, empty drums, and we do know that many of those empty drums might have, probably were used in the storage of gasoline.

Someone mentioned that C-120 aircraft, or C-123 aircraft probably defoliated Saigon. Not true. What apparently happened was that the C-123, the drums were picked up by the Vietnamese, gasoline was put into them, the gasoline was put into the mopeds, and the mopeds fogged Saigon--could well have happened. It is a tale to tell!

The aircraft loaded from F-6 trailers, so there wasn't a lot of drum in the aircraft itself.

In terms of environmental fate, we have to talk about the air, the vegetation, and the soil. The particle size for the herbicide, this is an important aspect for exposure. About 1.9 percent of the particles that were disseminated from our AA45Y1 spray system were less than 100 microns. Now only those very small particles might have been inhalated. You have to talk about very, very small particles for inhalation exposure.

Now the bulk of them were in the 100 to 500 micron range, and 20 or so percent in the greater than 500 micron range. Because of the size of the particles, we have studies that show that 87 percent of that material impacted whtin one minute from the time it was applied. However,

71

about 13 percent of it may well have drifted or volatized and one now can talk about downwind areas being contaminated.

Photodegradation of the herbicide has been well documented in terms of effect on vegetation from canopy studies of vegetation like that in Vietnam, studies from Thailand, from Puerto Rico, they all indicate that in the case of Orange, most of the material disseminated by the C-123 aircraft, about 94 percent, was intercepted by that vegetation, which says that only about 6 percent might have penetrated to the ground had there been ground troops beneath that multi-canopy forest.

Six percent would suggest about 1.4 pounds active ingredient per acre, which would be very comparable to a Ranch Hand application in the United States. Isn't that an interesting comparision?

Cuticular penetration of the herbicide has been shown to occur within some 30 minutes. This was the ester formulation, a non-water soluble formulation, which rapidly moves within the plant.

These are data taken on actual studies of soils with herbicide Orange, tropical soils. They were the Philippine studies. The life is only 7 days for 2, 4-D, 14 days for 2, 4, 5-T. In some sites 3 gallons per acre applications of Orange supported growth are very sensitive plant species within a four month period which says that the

72 persistence is very minimal of the herbicides. We haven't talked about TCDD yet.

The study by Crossby and Nash, and this study by Crossby was done with herbicide Orange, the second case by Nash, silivex was used for TCDD, and that essentially is their conclusion by Crossby, that 98 percent of the dioxin was degraded in less than six hours. This says in the presence of sunlight.

It says also when it is on a surface, a molecular layer, if it is down beneath many layers, it may not hold true. Nash found about 86 percent was degraded in about 32 hours.

In the case of TCDD, there is minimal transport within the plant. A number of studies have shown this. Also there is negligible plant uptake of TCDD. Our own Air Force study by Dr. Kerry at Beltsville have all shown there is essentiahly no uptake of TCDD by plants. It is not likely that new plants growing in contaminated soil would have had dioxin in them for someone to come along and eat.

Studies again by Crossby on soil showed about 20 percent that actually fell on the soil was degraded in about six hours. Our own Air Force studies of sites where heavy concentrations of purple had been applied in Florida, and I will show those in just a couple of minutes, that

73 indeed there are live ones in that soil, half live ones in that soil, could well be 1 year.

In the presence of the herbicide, once the herbicide fisappeared, we have found continued persistence of the TCDD. Those are facts, folks. Those are facts. In the soil, once in the soil, the dioxin is very persistent, but it doesn't leach. It doesn't go up in the plants. In order for animals to have been exposed. they would actually have to dig into that soil, to go back to one of the comments made earlier this morning.

If the dioxin got into the soil, presumably one could come in contact by handling soil. However, the concentration would be very, very minute as compared to what originally was applied.

There are data from our Eglin Air Force studies that show that it does bioaccumulate in animals, and I will elaborate on those.

Pacer Ho, the study where the herbicide was destroyed, this is Gulf Port, Mississippi, where the Air Force stored some 15,000 drums, 55 gallon drums of herbicide Orange for about seven years prior to the time that it was destroyed in September of 1977.

In the destruction of that material, the dedrumming operations, we had an excellent industrial hygiene program in operation. Not only did we monitor the

74

air within the dedrum facility itself, but also within the inventory.

Here is within the dedrum facility. Tops were cut off the drums. The herbicide was sucked out. The rest of the drum was dumped. As you will see here and during that entire operation for many of those individuals we had breathing zone units in operation.

How much herbicide would they have taken in during their actual operation? We have those industrial hygiene data, more samplers downwind.

Okay. In the dedrum operations we know from actual breathing zone studies that these kind of values, for 2, 4-D, 23.2, that would be micrograms per cubic meter; for 2, 4, 5-T, 13.7.

Now you have a considerable order of magnitude here for the dioxin determination. We did not detect dioxin breathing zones, at a detection limit of 8 parts per trillion in the air, 8 anograms per cubic meter. The TLV, the time limit value of these materials is 10,000 micrograms per cubic meter.

In the air downwind from the dedrum facility, you can see the values there. Certainly the concentration inside of the dedram facility in breathing zones was much greater than downwind from the dedrum facility, as one might expect.

75

Likewise, the water that was all around those facilities, these are data from the Johnston Island samples; we did the same thing out on Johnston Island where we had an inventory out there of about 25,000 drums. There was a chance for water contamination. We were able to monitor the water. You can see the amount of TCDD detected there; non-detected for TCDD, but for 2, 4-T and 2, 4, 5-D, we did find it.

Downwind, the same sort of values as one saw at the Gulf Port. Well, Dr. Haber--he's gone--I will very quickly have gone through Vietnam. I very quickly have gone through exposure. I have some slides of Eglin, but I know our timing is very critical. I will just say that our study at Eglin Air Force Base has taught us a number of things.

One, that the dioxin, the bulk of dioxin does disappear very rapidly; about 97 percent of all the dioxin applied down at the Eglin test site in northwest Florida where 162,000 pounds of 2, 4, 5-T were applied on an area of less than one mile, 97 percent of the dioxin disappeared.

Three percent that is persisting is that which is beneath the soil surface, and it has continued to persist for almost 15 years. Half life is very slow in that kind of a situation. We see there that animals that feed on the plants are not contaminated. Only those animals that

76 interact directly with the surface are contaminated. The beach mice that go in and out of that soil have concentrations of as high as 2.6 parts per billion in their liver, yet after 70 generations of study in this animal, we looked at them for 70 generations, we have not detected changes in the frequency of the number of fetuses per pregnancy. We have found no evidence of tertagenesis, no evidence of mutogenesis;because the life of the animal is too short, we have no data on carcinogenesis, but it doesn't say it doesn't occur. The life of the animal was too short.

What it does say, we have found the toxicity symptom, however, at those concentrations. We find an enlarged liver weight in the pregnant female--highly significant--although we find no histological abnormalities in any of the organ systems, including the liver, that we have examined.

We have found no evidence of uptake by glands. We have found no movement to the aquatic community, but only in areas where there is erosion. It does not leach by itself.

That is a summation. There are technical reports available, open distribution on the Eglin studies. The Vietnam data that I have presented, most of that is available in the technical report that has been presented

to all of you on the Committee.

DR. SCHEPERS: Thank you very much, Dr. Young. Are there any questions for either of these two doctors?

DR. MOORE: With regard to lolking for populations to follow up the possible long-term health effects, I am inclined to want to look at the population that most likely got the heaviest exposure. According to Major Young's presentation, that population would be that which is associated with the '62 to '64 timeframe, even though they aren't part of the Operation Ranch Hand.

MAJOR YOUNG: They were.

LT. COL. WOLFE: But there were very few of them, somewhat less than 100 people involved.

DR. MOORE: You have got a 20-fold increase in dioxin.

MAJOR YOUNG: We are well aware of that, Doctor.

DR. SCHEPERS: We have time for a few short questions.

MR. LARSON: I would like to ask about the timeframe of the green cloud area of Seveso, Italy. I understand some of the area is now beginning to be habitable after what was it, two or three years since it was exposed.

Now how does this jive with what Dr. Young just said?

MAJOR YOUNG: First, the dioxin was a totally

78

different source when it was put out as a herbicide. It was put out with hydrogen right there. When it is put out in caustic soda, there isn't a hydrogen donor available right there, although there may be one when it lands, so the way they were applied was totally different.

Dioxin is dioxin, but when it is applied in a herbicide, its fate may well be different than when applied in a caustic cloud. That is all I would point out.

MR. SMITH: Richard Smith--Major Young, was the Air Force's Operation Ranch Hand so coordinated that it was aware of the troop movements of the other branches of the service?

MAJOR YOUNG: When an area was selected for defoliation, that area had to be approved by the commander of that area. You are talking about the Army commanders would have been coordinated with, as well as the local Vietnamese commanders. Documentation of a herbicide mission was carefully done--not always. There could have been times, uniquely as I pointed out, in my opinion, where this might have not been true, but most times the coordination was done.

As a matter of fact, in the '67 timeframe, it had to go all the way up to Saigon and the upper echelons for approval, and then leaflets were even put out in some areas that were going to be defoliated.

79

MR. LINDLEY: Rusty Lindley--a lot of the Ranch Hand was done along the borders to demarcate the borderline between Vietnam, Cambodia and Laos, wasn't it, and also what would be the effect--we used to see Monsoons pretty heavily about four o'clock in the afternoon coming in from Cambodia and Laos when we were operating on the border areas--would that have any effect of picking up some of the residual herbicides on the plants and exposing it to troops that way?

MAJOR YOUNG: Demarcation was primarily done with blue. As to could there have been a mission of orange with an immediate rainfall afterwards, the answer is certainly there could have been and probably was many.

However, because it was a water insoluable formulation and because it penetrates so very quickly, there was probably very little runoff that could have occurred.

That doesn't say it didn't. There may have been situations where most of it might have, but I don't think that would have been a normal situation.

MS. BEVERDORF: Cheryl Beverdorf--I wanted to ask a question in terms of diagnostic procedures. You mentioned quite a few that are used in terms of tracing herbicides.

Has there been any test done on hair?

LT. COL. WOLFE: Not that I am aware of. Hair

80

has been done for lead and a lot of other metallic sort of things, but I am not aware of anyohe having checked it for dioxin because it is basically fat soluable, and hair is not likely a good spot.

MR. UHL: Dr. Young, two brief questions--one maybe you touched on when I was out of the room. Do you have a theory or perhaps even an explanation for data that seems to show that dioxin is present in mothers' milk, beef fat, and perhaps even meat of the shell fish from Vietnam, number one, and number two, should we be concerned with other toxic, if that is the right owrd and right adjective here, isomers of dioxin that may have been produced in the manufacture of 2, 4, 5-T?

MAJOR YOUNG. I am speaking for myself. In terms of the mother's milk samples of Dr. Messelson, the fish samples of Dr. Messelson and Dr. Brockman, two things should be kept in mind. One is where were the samples collected, and Art Westing has indicated those samples were colleged near Naval docks--very interesting, because Pentachlorophenol could account for dioxin contamination in those kinds of samples, so we don't know for sure that first question says if it is dioxin. We don't know for sure the source of that dioxin.

Dr. Messelson was the only one that did those analyses. They were never confirmed by another laboratory.

81

I am not suggesting that his laboratory isn't the best, but I am suggesting to you that the dioxin issue is so complex that no two laboratories often come up with the same data, and you must remember his analyses were done when the instrumentation technique was new, and so I don't know how much faith to put in on his data.

The Eglin data suggest that indeed dioxin can get into the aquatic community, but it doesn't move very far, only in erosion areas. We have never seen it move, for example, in areas even where there is heavy dioxin. In the silt we have never seen it move more than just a short distance, hundreds of feet. To move 27 miles downstream, and then to be present at that kind of concentration, 800 parts per trillion, would suggest that a massive quantity of herbicide Orange would have been directly to the water a very short distance upstream. There is no way to account for those large concentrations.

MR. UHL: That takes care of the mother's milk and the shellfish. What about the beef fat?

MAJOR YOUNG: The beef fat studies in the United States would suggest there is only one positive, 60 parts per trillion--Dr. Moore could be much more apropos to speak on this than myself. That is an EPA study. I will back off on it if I might.

MR. UHL: The other question was the other dioxin

82

isomers?

MAJOR YOUNG: There are many isomers available in Pentachlorophenol, probably in 2, 4, 5-T dioxin, that might be present there. You would have no more than 3 or so isomers of the Tetrachlorodibenzoparadioxin, okay, the 2, 3, 7, 8 being the most toxic, and the most numerous of the three tetra isomers.

We recognize that it is possible for the 2, 7 dibenzoparadioxin to be present for 2, 4-D, but its toxicity is totally different than the 2, 3, 7, 8.

DR. MURPHY: Are there analyses of Agent Orange and blue or whatever. for hexa?

MAJOR YOUNG: Yes. We have analyzed it, the hexa, oxa, penta, tri. We only find three tetras really that are present in Orange, and at very low concentrations; only the 2, 3, 7, 8 being the most prevalent we find a tri, and we find a di.

DR. MURPHY: You don't find any hexes?

MAJOR YOUNG: No, we don't. Dr. Kearney, you are aware of 2, 4, 5-T analysis. I am not aware of any.

DR. KEARNEY: Well, there is an early analysis done by Wolfson, Enzer and Thomas that said that there was hexa in 2, 4-D, but we have been unable to confirm it.

MAJOR YOUNG. Right. I was aware of that.

DR. SCHEPERS: I think we have exhausted all our

83 1 questions, so we thank you gentlemen both again for your
2 contributions, and we will proceed with the position papers
3 and we will deal with No. 3, coordinators Dr. Walter Melvin
4 and Dr. James Allen, who couldn't be present, so I believe,
5 Dr. Lingeman, you should discuss it if you wish to do so.
6 I will re-read the question, which says of what
7 diagnostic value are the following procedures in assessing
8 possible herbicide toxicity, levels of dioxin in fat pad
9 biopsies, study of immune factors, study of chromosomal
10 patterns, study of liver microsomal enzymes? What additional
11 diagnostic procedures should be considered?
12 May I ask volunteers from the Committee to
13 comment on level of dioxin in fat pad biopsies?
14 DR. MURPHY: Well, I gather that the answer to
15 this question was prepared largely by Dr. Allen just
16 because it has his name at the top of the page, and I think
17 his conclusion was the presence of dioxins in the tissue
18 indicates exposure. However, its absence does not rule
19 out previous contact is the answer to that part of the
20 question.
21 DR. SCHEPERS: Can we get anything further from
22 that position? Any contrary statements?
23 DR. MURPHY: I would also, with regard to the
24 area of hydrocarbon hydroxylase or the microsomal enzyme,
25 it is again, as he points out, rather non-specific. It

84

could indeed be a result of exposure to dioxin, but there are so many other things that would also induce that enzyme, or that group of enzymes that it would be rather difficult to say it was cause and effect.

DR. SCHEPERS: Would it be worthwhile, therefore, in the opinion of the Committee to pursue that further if it is so diffuse?

DR. MURPHY: If you are dealing with current exposures, I think it might be something that, well, it might be something you would design into a clinical study.

If it is past exposure, long past exposure, I doubt very much whether it would have value just because I think probably the effects would disappear. It is a reversible effect.

DR. LINGEMAN: It is too non-specific.

DR. MURPHY: It is non-specific. The chromosomal aberrations, I don't know. Somebody else should comment on that.

DR. SCHEPERS: I believe that Dr. Moore told us at lunchtime that there is some work that is being resumed by his department on the Aims test, so we will wait for the next meeting to hear from him since he is no longer here.

What about any additional diagnostic tests? Are there any that can be suggested by the Committee at the present time? I might mention that we are constantly

85

beseiged by the veterans asking us to do something to diagnose their condition, and we don't know what to do. We just have no diagnosis. No one comes with specific tests. They have been told that there is a specific test and that we don't seem to find that specific test other than dioxin, and we have already discussed that problem.

DR. MURPHY: Just to comment, as we discussed earlier today, demonstrating within a certain level the presence of the dioxin would be, of course, a test of dioxin exposure. Chances are in my view, and I gather this is shared by a number of other people, that you would not find after a prolonged period after exposure ceased, or the evidence of this which would not confirm or deny previous exposure, nor confirm or deny that any condition or complaint was associated with previous exposure.

Would you agree with that? Sad as it may seem, there are very few chemical exposures to which any particular measurement of any particular clinical condition is solely diagnostic of that chemical exposure. We just don't know enough about I guess how they cause their effects to isolate them out, so I don't know that there is any specific diagnostic procedures.

DR. SCHEPERS: May I think ask that if any of the members of the Committee or indeed anybody present in this room were to hear or to read of a test that might

86

be applicable to our area of inquiry, that you would report it to us at the next meeting so that we can consider it?

DR. MURPHY: Rather than ending my comment on such a negative point, it would seem to me that again there is a set of syndromes in which I suppose if a certain number were common, this would lead to a presumption of possible association.

DR. HALPERIN: Could I make a comment? The question reads of what diagnostic value are these things. We don't know what their prevalence is in a known exposure situation, for instance, in one of the occupational exposures.

If we don't know what the probability is of these in known exposures, to do them in a diagnostic setting doesn't to me make much clinical decision theory kind of sense.

DR. SCHEPERS: Possibly after you have studied the Arkansas data, you might be able to tell us more about them. We have to wait for a solution.

Dr. Lee, did you want to make any further comment on the diagnostic value of the fat biopsy for the record?

DR. LEE: None whatever, thank you.

DR. SCHEPERS: Let's proceed to question five then, which was what topics should be included in educational curricula being developed to upgrade knowledge of potential

87 herbicide toxicity among VA staff members? This was assigned to Jack Griffith. Dr. Gross, did you get a chance to go over, review with Dr. Griffith what he said?

DR. GROSS: The answer is no, sir. That is the first time I have seen his response, right here. You all can read this as well as I can.

Jack was thoughtful enough to have brought along a training course, a package that we used in training health professionals. As you can see, it is that big. It contains some literature, a bunch of slides and tapes, and you would be welcome to have that to see whatever use this could fulfill.

DR. SCHEPERS: Could you leave it with Mrs. Williams so that we can study it and see what practical use can be made of it?

You know, Dr. Gross, that we are going to have an educational exercise on Thursday and Friday for about 172 doctors, and we will see if any of that is even applicable for that.

Certainly the presentation such as Dr. Wolfe and Dr. Young made will be extremely useful to our staff.

Are there any other comments from the Committee on this topic? We have drawn a blank sort of so far. Any from the Steering Committee? None.

MR. HIGHT: Henry Hight, Board of Appeals-- from

88

what you have said, and I don't have a report on that, is the VA continuing with the fat biopsy study?

DR. SCHEPERS: Dr. Lee will answer you.

DR. LEE: We have closed the accession of case material at 34. We are now busy processing the data, also waiting for the chemist to do his thing.

DR. SCHEPERS: Once we know what the answer is from that study, we will know what to do next.

DR. LEE: I hope!

MR. HIGHT: Thank you.

DR. SCHEPERS: Let's proceed to question No. 6. I am trying to beat a time limit because we have another 20 minutes for our meeting and six more questions to consider.

This was a position paper on what sorts of animal studies would make the most important contributions to understanding the potentially toxic effects of herbicides in humans?

The coordinator was Dr. Allen. The paper was written by Dr. Allen. Has anybody had an opportunity to study it? Would any of you like to comment on it? Dr. Murphy, you are an experienced animal experimentalist. Would you like to comment?

DR. MURPHY: I have a few lines emphasized in yellow color here, but I didn't really have too much in the

89

way of comment. He does comment that he would select an animal model which responded to herbicides in a manner similar to man and was as closely related phylogenetically as possible. "In our work, we have found the rhesus monkey to be a suitable model."

I believe he is referring to the rhesus monkey in PCB work, or maybe it is dioxin. I don't know how Dr. Allen judged it was a suitable model because I don't know that there is enough data in man to say that man responds similarly, and certainly in this I think there are, in the Seveso circumstance, one of the surprising things I guess is that it wasn't any more severe, acute, apparently systemic toxicity experienced by man than there was in view of the rather severe effects on a number of laboratory animals.

Of course, they were eating grain and forage and so forth, and so I agree with the principle, but I don't know what animal to select.

DR. GROSS: You mean domestic animal?

DR. MURPHY: I don't know what other--I mean non-human animal. I don't know what non-human animal model best represents humans. Do you?

DR. GROSS: No.

DR. MURPHY: For this particular study?

DR. GROSS: No.

DR. MURPHY: The principle is well taken, but I don't know how to answer that.

DR. SCHEPERS: The statement was made a little earlier by Dr. Young that--what was the little animal called that burrows?

MAJOR YOUNG: The beach mouse.

DR. SCHEPERS: The life is too short for you to be able to do a carcinogenesis study. Is that really true?

MAJOR YOUNG: The life is short only because of high predation. At the Eglin test site we find that many, many other animals feed on the beach mouse and in data that I did not show you, we put animals into that site, beach mice, and then came back at 90 day intervals and we found that for the dioxin levels to reach the same level as the animals in the environment, indigenous, it was about 90 days, but we also found from that study that the half life of the animal was very short because other animals preyed on it so rapidly.

DR. SCHEPERS: Could that animal be placed in a laboratory where it would be protected?

MAJOR YOUNG: We have raised it in the laboratory for as long as two and a half years.

DR. SCHEPERS: Could you produce any health effect?

MAJOR YOUNG: We did not at the exposure rates

91

that we gave the animal, which was comparable to those on the sites, but our population for a carcinogenesis study was very small and we felt it to be so preliminary as to be unpublishable.

DR. SCHEPERS: You said you went through 70 generations?

MAJOR YOUNG: In the field over the years of following those animals we began in 1970 and our last sampling of that population occurred in April of this year.

DR. SCHEPERS: Life wasn't too short if there were 70 generations for the animal to reproduce obviously, so were there any teratogenesis effects or would that also be destroyed by predators?

MAJOR YOUNG: Conceivably if you are going to examine for teratogenesis, you have to know when fertilization occurred, and because these are field populations, you don't know exactly when fertilization would occur and since how we examine the burrow is to dig up the nest and examine the female with the offspring, we have done this many, many times. We have never seen cases of teratogenesis of the 180 or so animals that we have examined.

DR. SCHEPERS: Did I hear somebody say today that somebody mentioned that dioxin is excreted in the spermatic fluid?

LT. COL. WOLFE: That has been hypothesized, but

92

no one has ever gathered enough material to have it analyzed I guess.

I am not aware of any studies. That has been hypothesized purely from a theoretical chemistry standpoint, but no one has done that work yet.

MR. LINDLEY: I don't know what its significance is, but there was some work accidentally done with dioxin at the Jackson Laboratory in Bar Habor, Maine, in an experiment with pin worms that had considerable adverse effects on their mice there that somebody might look into.

DR. SCHEPERS. Yes. We have seen most of those. We are still trying to look for that ideal animal. Mr. DeYoung?

MR. DE YOUNG: I am sure I don't have the ideal animal, but I do have an animal, and I submit that we have some pretty good documentation.

I would like to read a statement that you will be seeing in print later this week.

"During July and August, 1972, I was assigned to the K-9 Corps at Phu Cat Air Force Base. During this period, many of our dogs came down with a mysterious illness." This is written by an Air Force MP guard dog handler.

"The symptoms were that at first the dogs became very lethargic and vomiting a lot. Then some of the dogs who weighed 100 pounds or so suddenly lost weight drastically.

I mean some of them lost over 50 pounds in less than two weeks. The dogs had also developed a change of personality. They became more aggressive during this period. The ones still well enough to go out on patrol turned on their handlers, were very hyper, and seemed very confused. Later when we took these dogs to Cam Rahn Bay, they developed severe rashes and blotches of hair fell out. Nobody really knew what caused this.

"At the same time, almost all of the K-9 personnel got a sudden, severe case of diarrhea and abdominal cramping. There were lines of people so long that other facilities had to be made available to us.

"Many of the dogs died after getting what seemed like a sudden and last symptom--a bloody nose. Once the dogs got the bloody nose, they died.

"I was quite aware of these symptoms because my dog contracted them also and could not work, so I was assigned duties which included caring for these dogs. My dog eventually got better, but was never quite the same. He reamined very slow and seemed confused all the time. I was so attached to him I would never have turned him in for another dog," signed by a veteran who was there in 1970, '71.

I would submit that the Air Force has probably kept excellent records on these guard dogs. They are a major

94

investment. I have spoken to a number of the handlers who were over in Nam. They have very similar stories to report of sudden mysterious illnesses with their dogs, hair falling out and rare blood disease, quote, unquote.

I submit there is enough verbal similarity there that it should be researched intensively. I think Lakeland Air Force Base would be the place to start.

DR. SCHEPERS: We will ask the Department of Defense officials to check this. Thank you.

DR. LINGEMAN: They are all sentry dogs that died during that period that you are talking about. Tissues were sectioned at the Armed Forces Institute of Pathology, and I will check today or tomorrow and find out if one of your questions can be answered because the dogs were destroyed it is my understanding when they finished their term of duty there. They were not brought back to the United States.

However, those that died, some tissues I know came from Vietnam into that registry and I will check that out.

DR. GROSS: In veterinary pathology they call them military working dogs.

MR. DE YOUNG: It strikes me as stronge that none of those dogs, almost without exception, were brought back from Vietnam. Most of them were destroyed over there because they were unusable for any practical purposes.

95

DR. LINGEMAN: They were destroyed, but the ones who died, there are at least 600 I think, something like that, on file, not just from Vietnam but all the sentry dogs wherever they were.

DR. SCHEPERS: It sounds very valuable to me.

DR. HOBSON: Is there any evidence that those dogs were exposed to any of the herbicides, specifically those contained in dioxin?

MR. DE YOUNG: Logical evidence from the veterans' statements, if you assume they would have worked the perimeters around the wire and were in that general area, that is the area that would have been defoliated by the hand-operated units.

DR. HOBSON: Not with Orange, as I understand it.

MR. DE YOUNG: I have no opinions on that at all. Captain Young would be the person to talk to about that I'm sure. It is unquestionable herbicide was used. We have many photographs from the vets who brought those photographs back that showed dead brush by the wire.

DR. SCHEPERS: Thank you very much, Mr. De Young. We will look into that.

Now the 7th question, if I may go on, is what additional data should be included in the VA's herbicide registry over that currently collected, and Robert Lenham was the coordinator and he thought that our

96 registry was perfect, which was very flattering.

MR. LENHAM: I don't want to burst your bubble, but just in the discussions today,what we did, we went out to our field personnel and asked them for their comments also as representatives, and at the time they felt that the VA was making the right approach upon arranging to get as much data as possible.

Now this morning it was learned that apparently an epidemiologist from John Hopkins, Dr. Lilienfeld, being an expert in his field, has questions that possibly we should be asking. Maybe we should include in this registry as far as information that we should gather, and I would suggest then and recommend that if this be the case, that we go ahead and include those questions in the registry.

DR. SCHEPERS: That we shall do. Ms. Kilduff has returned. We have been discussing your registry. You heard what he said?

MS. KILDUFF: What are some of the items?

MR. LENHAM: Dr. Levinson didn't really give us that information. I would assume he would have it, and I just want to point out that if we are getting information and the Doctor has said it, I would suggest that you do that, that we follow suit and put that in with the registry.

DR. SCHEPERS: If there are any brainwaves which come from any of you as to what we ought to really put into

97

our inquiry, documents, please send them into us and we will give them all the consideration that is due to them.

Let's proceed to question 8, which was 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?

Dr. Kearney was the coordinator. Dr. Kearney, would you like to comment?

DR. KEARNEY: First of all, we discussed the amounts used there. We have talked about the persistence of these four materials in soil, 2, 4 being the least persistent, and TCDD being one of the more persistent materials.

We talked about concentrations in air. We talked about the persistence and concentration of these materials in water, and then we tried to talk about routes of human exposure.

I don't know from any data we have from the domestic United States that we can get any clear idea of what the human exposure might be. I want to talk to the Air Force a little more closely to see if they might have some impression as to what the inhalation exposure might be, but I don't think we can calculate it.

We tried a number of calculations, and they

98

weren't very successful. I guess that's all I have to say.

DR. SCHEPERS: A question for Dr. Young--in your slide presentation, you said that the penetration through the skin was 30 minutes?

MAJOR YOUNG: That is cuticular on leaf surfaces; in the case of humans, the study we have of 2, 4-D, the penetration was about 5.8 percent of the applied dose and that was a calculation based upon following the 2, 4-D acid in the urine, and it was a five day collection period showing that only 5.8 percent was absorbed.

Now how good a study was done on six people--

DR. SCHEPERS: What about the persistence of dioxin in clothing and utensils? What can you inform us with respect to that?

DR. KEARNEY: In the lab we have to get rid of the glassware. It can become contaiminated after a while. We melt it, bury it. We don't want to keep it in the room.

MAJOR YOUNG: I would suggest indeed that contaminated clothing was a big problem in Vietnam with the Ranch Hand personnel.

DR. SCHEPERS: You mentioned the shoes.

MAJOR YOUNG: The shoes, the pants--a continual problem.

MR. LENHAM: Wouldn't this also be a problem with

the troop personnel?

MAJOR YOUNG: Had they received a direct application, then perhaps you would be correct. We haven't done studies, for example, of putting dioxin on leaf surfaces and walking through it to see what amount might go off, but its immobality in water would suggest that if it is on the surface of the clothing, the likelihood of it getting in probably would be fairly small. That doesn't say it can't happen, and if they reversed their underwear perhaps maybe so. I don't know. We do know that changing clothes all the time was not a frequent occasion for the battle troops or the troops in the field. They might wear the same clothes for more than one day certainly.

MR. DE YOUNG: There was an episode of a plant accident in England where the workers in a phenol plant of some sort were contaminated with dioxin and by going home after the work at the plant was done, and cleaning up for that day, their family got contaminated as well. Some of the women had an outbreak of chloracne after washing the clothing which leads to the next logical question, if indeed the Ranch Hand clothing may have been contaminated, does this possibly explain the women that we have seen who are wives of the Vietnam veterans and yet manifest symptoms themselves?

MAJOR YOUNG: Let me clarify the accident. This

100

was in Derbyshire, England, in 1968. This is the incident where there had been an explosion in the factor and these individuals went in and were cleaning an area where there was gross contamination of caustic soda and TCDD, and then they took their clothes home for their wives to wash them.

That is a totally different picture than if one talks about having herbicide and TCDD together. They are not comparable at all. Not only that, but you are talking gross exposure. The Derbyshire situation probably had well over 2 kilograms of TCDD involved in a small confined area. Most of the men developed chloracne during the time they were working with it.

Not surprisingly, the women who handled the clothing came down with it because apparently there was a heavy concentration of TCDD.

MR. DE YOUNG: Are you saying no then?

MAJOR YOUNG: I am saying the likelihood of having orange on you and doing that is a different story.

MR. DE YOUNG: How about purple?

MAJOR YOUNG: In the 1962 through '64 time period, it is much more likely, surely--again, all the more reason to perhaps focus in on that early group.

MR. DE YOUNG: I wouldn't say it is widespread, but we have a number of women, interestingly enough, four or five of them wives of helicopter pilots, all of whom were

101

shot down on herbicide missions, and many of them grounded, of course, in freshly sprayed patches. Those are some of the more seriously sick of the cases as far as the men themselves are concerned.

Three or four of their wives also have skin eruptions and have had the female problems that come with a woman being exposed.

MAJOR YOUNG: Was the woman in Vietnam?

MR. DE YOUNG: Not at all. The woman never left stateside, and it has got us going up a tree, needless to say.

LT. COL. WOLFE: It seems like he would have to bring a lot of dirty clothes home.

MR. DE YOUNG: We are casting around for an explanation of how this, whether this is psychosomaticlly induced by the husband's illness or what.

DR. SCHEPERS: This problem of contamination of clothing, utensils, is receiving growing attention in the present era, and it cannot be minimized, and it certainly is a factor possibly in the military situation in Vietnam so we will study it some more and see what can be had.

I hear no other great enthusiasm about this topic, so we will go on to question No. 9. Dr. Lingeman responded to the question what medical tests should be utilized to help establish a diagnosis of chronic herbicide-induced

102

toxicity among Vietnam veterans? She wrote an M. D. thesis here I believe.

DR. LINGEMAN: I apologize for the length.

DR. SCHEPERS: It was beautiful, but I hope you won't read all of it this evening. Could you comment some more on that?

DR. LINGEMAN: Dr. Wolfe very nicely provided a background. What this is is the right side of your slide where you pull out all the stops and do a research project.

However, we are dealing with a lot of unknowns, and I would suggest we consider certain groups of these people as research subjects and perhaps enlist a research institute, for example, the National Institute of Mental Health might be interested in developing a suitable set of standardized tests to test for psychiatric symptoms. Perhaps our National Institute of Neurologic disease might be interested in developing an appropriate protocol for evaluating the neurologic problems.

There is an addendum for the neurologic examination. Neurologists not only advised nerve conduction velocity studies, but there is also the possibility of some nerve and muscle biopsies. It would possibly be done only in specialized situations, but these are available.

I think we have to realize that these veterans

103

were before, during and after the Vietnam war exposed to a great number of other things which are very likely to cause some of these same types of syndromes that we are talking about to sort out a medical syndrome that specifically applies to dioxin would be extremely difficult, but I think we can maybe on some people, not the total population, but we could do some very exhaustive studies and perhaps as pilot studies come up with some answers, some things to follow through down in the greater population, concentrating on those systems which we believe are most likely to have been damaged by this material.

DR. SCHEPERS: Dr. Wolfe commented on the scarcity of neurologists in the Air Force. The Veterans Administration has a general supply of neurologists, not all that we need, but perhaps enough, but tests like electromylograms and nerve conduction velocities can be done at any Veterans Administration hospital because they are done in our rehabilitation medical services, and they all have the instruments for that, so that would be a practical thing, not difficult to do on a Vietnam veteran, so we will consider including that in our protocol.

Any other comments pertaining to question No. 9?

DR. HALPERIN: Yes. The addendum that you just made should clearly be stated because in reading this, it was not clear to me that we were recommending the following

104

special thing be done, on all veterans claiming exposure to herbicides from Vietnam, including nerve biopsies and testing, before we even do renology consulting and so forth.

I think I understand your point, the difference between clinical practice and experimental research, but that is not clearly stated in the position paper.

DR. LINGEMAN: Perhaps I should follow Dr. Wolfe's line of thinking because to separate out what is practical from what is research and maybe somewhere in the middle between these two extremes would be good.

DR. SCHEPERS: Just to reassure you, Dr. Halperin, I have seen nerve and muscle biopsies done on some of these Vietnam veterans who are under study.

R. HALPERIN: Under study, comma, under study, is this someone coming into the VA for some unrelated disease who says that he may have been exposed, and all of a sudden he is down the buzz saw of some tremendously invasive procedures?

DR. SCHEPERS: This would be done only on people who are obviously very seriously ill who are hospitalized who have been studied for all other possible explanations and none found, and then the doctors resort to these rather unpleasant and very expensive procedures.

I know they do them. Thus far we have had no

105 clues from any of this information, but it certainly is an experiment.

DR. LINGEMAN: It is too strong a statement then, all veterans--selected veterans?

DR. SCHEPERS: Just for clarification, the staff of the central office will edit all these position papers, consolidate the comments that we received today, with the position papers, and possibly add a few sentences where we think it is relevant, and then re-present them to the members of the Committee for further consideration. Is that the game plan?

DR. CASTELLOT: Yes. In view of the time, you probably ought to consider the possibility that those papers which were not covered by the Committee members, if they have any pertinent comments which are felt to be important, they should submit them to the central office to Mrs. Williams. We will then put all these things together into a revised packet of position papers sent to the Committee for their review before any further adoption is carried out.

MR. HIGHT: Since the Administrator has indicated that any veteran who thinks he was sprayed or exposed shall be given a physical or examination, as they put it, should not then these examinations be put into two or three different classes--those who have symptoms and those who

106

merely say I think I was exposed, and I want to know whether anything is wrong with me, so you are going to have to put two different classes of examinations on those people.

You are not going obviously, as the Doctor pointed out here, that you wouldn't go into the deep examinations that might hurt someone if he has no symptoms at all.

DR. SCHEPERS: I agree with you absolutely, and I think we will write recommendations along those lines, Dr. Castellot, to have sort of a circular spelling out the details.

DR. CASTELLOT: This whole thing needs to be reviewed. I think that is a good point.

MR. LINDLEY: If you don't have any valid diagnostic tests at this point, what is the purpose of telling the veterans to come in and be tested?

DR. SCHEPERS: Because medical diagnoses, practically all medical diagnoses are made by reviewing the total spectrum of the patient's condition and deducing from that collected information a diagnosis.

It is sometimes 100 percent accurate, sometimes 95 percent accurate. We are hoping that by doing it in like manner for the present problem that we will get those two diagnoses.

107

There is no specific test, for instance--in pernicious anemia you can do a blood count and make your diagnosis. There is no blood count to tell you about dioxin poisoning.

MR. LINDLEY: I think it is very important that that point be made clear to the veterans, that they will try and assess what problems they might have, but that the VA cannot definitively detect dioxin.

DR. SCHEPERS: That is a good point.

MR. LENHAM: If the veterans that are being tested now are given the tests that you recommend and this information is put in the herbicide registry and then if later on down the road we find certain specific examinations which would be a pretty good clear indication, give us a pretty good clear indication to us whether or not a given individual, given veteran was exposed to dioxin, would the VA maybe attempt to re-contact the early veterans that had been examined to maybe let them go through this examination also?

DR. SCHEPERS: That is our standard procedure, yes.

MR. LINDLEY: This is sort of an irrelevant point, but a lot of veterans are using Agent Orange as a lead into possible personal adjustment or psychological problems they might be having as a result of their military service, and there probably should be some coordination

108

with the readjustment counselling program for veterans that might need assistance in that area, and it is also a good way to avoid some of the stigma that is associated with psychological problems in Vietnam veterans.

DR. SCHEPERS: We agree with you absolutely. It is just a little bit difficult to get them all together in hospitals and this is the reason for our conference here with our doctors.

If I might clarify it again, we have asked one doctor for each one of 173 hospitals to come in this week and some of the members of the Committee who are able to be with us on Thursday and Friday will discuss with our doctors how best to handle the veteran, and this point will again surface during that discussion.

MR. LARSON: I thought of three possible modes of entry of dioxin in the husband and wife cases--one, a possible exhaling of the husband's breath, could the wife foreseeably inhale the husband's breath, and secondly, saliva; thirdly, are there any organisms such as viral organisms or bacteria that could ingest, perhaps selectively ingest the dioxin and be transferred to the spouse?

DR. SCHEPERS: Those are all three new ones to me. Any comments from the Committee? Certainly it is on the record. We will think about it. Thank you, Mr. Larson.

Let's go on to question No. 11. We are crowding

109

the time, and I notice that question 10 has no position statement, so we can pass it. Eleven is by Moore and Thiessen. Neither of them are here now. Would you prefer that we discuss this at the next meeting? We will do it by mail.

DR. CASTELLOT: Dr. Haber's view is that those papers which are not discussed at this time by the Committee should be reviewed by individual Committee members. If they have any changes or comments, they should submit them to Mrs. Williams as soon as possible. We will get out a timetable in that regard as soon as we can.

DR. SCHEPERS: We have Dr. Murphy here, so let's do the last one on question 12. To what extent is information potentially available on the effects of Agent Orange on the indigenous Vietnam population?

Dr. Murphy, any more you want to add?

DR. MURPHY: I have nothing more to add, just re-emphasize the question is one that can only be speculated on. It is not really a position paper, but it would seem to me that another group of high exposure,potentially high exposure people are natives of the island of Vietnam, and the problem of identifying, following them, et cetera, is probably much greater than that for military personnel, the U. S. military personnel, but nevertheless, I don't think they should be excluded.

110 The rest of it is international politics. I can't speculate on that.

DR. SCHEPERS: Is it not true that some of the Vietnamese personnel participated with the United States forces in Ranch Hand and other similar operations?

MAJOR YOUNG: In the early years of the Ranch Hand program, '62 through '64, there were a few Vietnamese that worked with Air Force personnel in loading the aircraft and this would have had to have been almost done exclusively by hand. We didn't have any big pumps or automated systems for transporting the herbicide by hose networks, so it was all done by hand--a very slow, tedious process.

There were Vietnamese involved. However, in '64, late '64 through '66 time period, there were a lot of Vietnamese, the National Academy of Science talked about a group of at least 50 individuals that worked on the drum handling operations.

After 1967, late '67, '68, and especially the '69 timeframe, we got away from using Vietnamese primarily because of the security problem, but there was a period in there where there were Vietnamese that were involved in handling, and I would also point out there were many women. As a matter of fact, most of the Vietnamese that handled them in those years were women.

DR. MURPHY: You also have children involved as

a community exposure, too.

MAJOR YOUNG: Very definitely.

DR. SCHEPERS: We discussed this topic briefly with the Vietnamese doctor who came to visit us, Dr. Tung, and he wasn't very knowledgeable of this aspect because he is a North Vietnamese and he didn't know what we did in the south, but hopefully when their country is reunited, they will study their own people and discuss it further.

DR. MURPHY: Did I understand earlier today there was a report or you had a report from this doctor that you mentioned?

DR. SCHEPERS: He came to see us on Dr. Haber's invitation and gave a presentation to our staff, discussed what he knew about the subject. There is no formal report.

DR. CASTELLOT: No. Dr. Haber indicated this morning, Dr. Murphy, that he would try to get what data is available in terms of that visit and submit it to the Committee for their review.

DR. MURPHY: I noted that in my mind and I thought why didn't I have this if I am asked to write a position paper on it.

MR. DE YOUNG: While we are on the subject of populations, Dr. Schepers, has it been considered that we are currently every day now taking in quite a few Vietnamese who are being taken in through immigration in the boat

112

people campaigns, and I would suggest that we have here a very good population for study as well.

I would suspect that the documentation of these people coming in is being fairly well done by the Immigration Service.

DR. CASTELLOT: I would think the difficulty we are experiencing with our military population as has been expressed earlier, if it is as difficult with those people, I think it would be more difficult with the Vietnamese coming in.

DR. SCHEPERS: I feel a little despondent about that subject myself. My impression is that these boat people are chiefly from downtown Saigon anyway. Many of them are Chinese. I doubt whether they were involved with war to the extent the issue that we are trying to address would require, but we will of course take cognizance of any information that comes to us.

The last question was one I had to take care of. We did take care of it by asking Mr. Cleland to write to the Secretary General of the United Nations. We do know that letter was sent off. We have had no reply, so we have no comment for you on that subject, but we will ford it to you if we do get a reply.

That brings us to the end of our meeting, unless there are other questions and answers that you wish to be

113

involved with. Mr. De Young?

MR. DE YOUNG: Just a short statement--in the interest of maintaining credibility for the entire scientific community, I would like to make it a matter of record that the National Veterans Task Force at this point would support an outside study of the Ranch Hand personnel, as I say, in the interest of making sure that everyone to whom the facts are put when the study is over will accept the facts, and that it not be a partisan study or an in-house study either by VA or the Air Force.

I would suggest in the interim until a better name is suggested that NAS be asked to do that study, the National Academy of Sciences.

DR. SCHEPERS: We thank you for your suggestion. Any further comments? If not, we will declare this meeting adjourned. Thank you very much for your participating. The next meeting will be announced in the mail.

(Whereupon, at 3:50 p.m., the meeting was adjourned, to be resumed at an undetermined date.)

REPORTER'S CERTIFICATE

DOCKET NUMBER:

CASE TITLE: Advisory Committee on Health-Related Effects of Herbicides

HEARING DATE: September 24, 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

VETERAN'S ADMINISTRATION

and that this is a true and correct transcript of the same.

Date: September 24, 1979

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