June 11, 1979

TRANSCRIPT OF PROCEEDINGS

IN THE MATTER OF:

Advisory Committee on Health-Related Effects of Herbicides

Veterans Administration
Washington, D.C. 20420
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, June 11, 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.

JAMES R. ALLEN, JR., Ph.D.
Professor of Pathology
The University of Wisconsin
Medical School
Department of Pathology
Madison, Wisconsin

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

BILL L. STEPHENSON
Environmental Protection Agency
Washington, D. C.

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

RICHARD A. LEMEN
Assistant Chief
Industrywide Studies Branch
Robert A. Taft Laboratories
Cincinnati, Ohio

ROBERT H. LENHAM
Special Projects Officer
Disabled American Veterans
Washington, D. C.
ADVISORY COMMITTEE MEMBERS PRESENT (Con't):

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

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

COLONEL J. W. THIESSEN, MC USA
U. S. Army Environmental Hygiene Agency
Aberdeen Proving Ground, Maryland

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

ALEX KUTNER

PAUL LEGOLVAN, M.D.
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[2021-02-04-0808]
DR. HABER: We would like to begin promptly. Without further ado, I would like to introduce to you our Chief Medical Director, Dr. Crutcher, an outstanding internist, a man who is more concerned I think with clinical practice of medicine in the Veterans Administration than any of his illustrious predecessors.

Dr. Crutcher has taken time from his very busy schedule to address us this morning, and I therefore introduce him to give you an official welcome.

DR. CRUTCHER: Thank you, Paul. The Administrator is receiving his doctorate degree from Emory University in Atlanta, and he is supposed to be making a benedictory appearance this afternoon, but air travel being what it is, he may not make it.

I personally wanted to open up this session because I think the problem of long-term effects of herbicides as it may affect our patients in the Department of Medicine and Surgery is one of significant concern.

I would like to congratulate Dr. Haber and his committee for having gotten such an expert panel, and I would thank those who are on the panel and advisory committee for taking the time from your busy schedules in order to contribute your experience, your talents, and your thoughts regarding this program.

From my perspective, I think the major area of difficulty here will be one of communication. Those of us in the biomedical field often say things and often our
patients don't understand what we say, even though we think it is very simple.

Those in the bioscientific field say things that those of us in the biomedical field hear but do not understand. Even those who are presenting their scientific treatise are not perfectly clear to those who are in the group.

I know from being on a research and development committee for many years that sometimes with some of the more specialized technologies, I couldn't understand the language, although I could read the words.

Those patients of ours who are neither biomedical careerists or scientists, but perceive signs and symptoms as they affect them, and its possible relationship to long-term effects of herbicides, have their own language and their own mind set.

I think that as a result of this, there is a possibility of having three groups of people, or perhaps four— the advocates of the veterans groups, having four interested groups of people, all well intentioned, all speaking with somewhat inexperience, ending up that there is a veritable Tower of Babble regarding this problem; and I think that the veterans groups and the veterans and the scientists and the biomedical people should probably be overly receptive to try and understand what the people are saying.

I have absolute confidence in the experience of this advisory council, but I am speaking as a physician. I have confidence in the scientific contributions that many of the members of this advisory committee have been
making in working on dioxin for many, many years.

At the same time, I have a tremendous respect for patients, and I feel that they have symptoms. They perceive symptoms that may be related to a specific cause, and then the ability to transmit or to change their attitude, or to change our attitude, becomes then a very difficult problem of who is saying what to whom, and what are we trying to do.

I think finally overall, though, that the Department of Medicine as part of the VA, is a very personal agency. We are dealing with people constantly every day. I don't think we are bureaucratic. Of course, it is up to us to prove the fact that we are not an insensitive, bureaucratic agency that is not receptive to what people are saying, but to put forth the picture that we are a group of dedicated individuals whose primary goal is to take care of those veterans that the law says we ought to take care of.

I think, Paul, with that as my overview, then I think this committee can work through these difficult communication problems, as well as gathering together some type of logical scientific data and chronology of whatever effects there may be, at what time, of those who served in our armed forces.

DR. HABER: Thank you very much, Dr. Crutcher.

We appreciate it.

DR. CRUTCHER: It is good to see you all, and those that are in the audience.
DR. HABER: I would like now to move on with the agenda, and this calls for introductions, and I would like to ask the Committee and the Steering Committee to introduce themselves. We are arranged in alphabetical order.

Would you please give us your name, your academic or governmental affiliation, and in a few words, what you do, what is your own particular expertise, whether you are an epidemiologist or a biochemist or a clinician or whatever other appropriate designation you need so we can address you appropriately, and maybe we may begin with you, Dr. Allen, heading the alphabet.

DR. ALLEN: My name is James Allen. I am a professor of pathology at the University of Wisconsin Medical School. I have been there for approximately 20 years and during this period, have been interested in research on the halogenated hydrocarbons and the dioxins.

DR. BRICK: I am Dr. Irving B. Brick. I am a professor of medicine and Chief of the Division of Gastroenterology at Georgetown University School of Medicine, and also a senior medical consultant to the American Legion.

My interest is primarily clinical gastroenterology, and in particular liver disease. I am going to be interested myself to learn what these experts are going to teach me about the effects of these herbicides, particularly on the liver and other organs in which I am particularly interested.
Also as a representative of the American Legion, in handling many claims of veterans before the Board of Veterans Appeals particularly, the impact of the findings of this Committee will have great future effect on veterans' claims.

All of us in the American Legion are dedicated to trying to find out the truth over and above the emotional connotations that have been aroused by the particular subject that we are going to study.

Thank you.

DR. ERICKSON: I am David Erickson. I am Deputy Chief of the Birth Defects Branch at the Center for Disease Control, Atlanta, Georgia, and I am an epidemiologist by training and occupation and avocation, and I am primarily interested in the population dynamics and etiology of birth defects in humans.

DR. KEARNEY: My name is Philip Kearney. I am the Chief of the Pesticide Degradation Laboratory, U. S. Department of Agriculture at Beltsville, Maryland.

My major interest in this area deals with the chemistry of the dioxins and their environmental aspects. I have followed this for about nine years, and I have visited Italy in '76 and have had a lasting interest in the environmental treatment and chemistry of the dioxins.

DR. HABER: I am Paul Haber, Assistant Chief Medical Director for Professional Services whose responsibility it is to help direct patient care programs, and Agent Orange is something very much in our minds.
It is my job to try to get to the bottom of this for the VA and to advise the Chief Medical Director and the Administrator, on appropriate steps that need to be taken in order to solve this problem.

DR. SCHEPERS: I am Gerrit Schepers. I work for the Medical Service in the Veterans Administration. I am an internist and pathologist by training. I have worked in the field of toxicology, particularly carcinogenesis, for the past 25 years, and for the past year, I have been almost what one might call project officer for our Agent Orange problem.

Recently we have received all this extra help so that I need not call myself project officer any more. Thank you.

MR. LEMEN: My name is Richard Lemen, and I am with the National Institute of Occupational Safety and Health, and my background is in occupational epidemiology, and I have done my doctoral training at the University of Illinois.

I am in charge of the Industrywide Studies Branch, which is the primary area where long-term chronic epidemiology is done, and our interest is in the occupational effects of dioxin and what we might be able to help learn as far as the environmental effects by looking at occupational groups.

MR. LENHAM: I am Bob Lenham, the special project officer for the Disabled American Veterans Organization. I do not have a scientific background. I am here representing...
the veteran as a veteran consumer. I am a Vietnam combat veteran, a hospital corpsman, that was assigned to the Marine Corps over there, and I, too, share with Dr. Brick the concerns and the input that we will have from this Committee and how we shall deal with this input in the claimants that we represent that come before us, before the Disabled American Veterans.

DR. LINGEMAN: I am Carolyn Lingeman. I am a pathologist. I work for the National Cancer Institute and have for the past ten years worked in environmental carcinogenesis. We are particularly interested in chemical compounds which cause cancer. I am also at the present time working at the Armed Forces Institute of Pathology on a special project involving attempts to collect pathologic materials from humans exposed to chemical carcinogens, and the problem is to document exposure to a toxic chemical and to determine whether or not a person does indeed have cancer or other disease that could be attributed to that chemical compound.

DR. MOORE: I am Jack Moore, Associate Director of the National Institute of Environmental Health Sciences, which is an institute of NIH that is concerned about the effects of environmental chemicals on the health of man.

As a toxicologist, I have been involved for the last nine or ten years with research trying to understand what typical benzodioxins as well as other dioxins may do on biological systems.

DR. MURPHY: I am Sheldon Murphy, professor of toxicology at the University of Texas Health Science Center
for approximately the last two years, and 14 years before that at the Harvard School of Public Health.

I have had a long time research interest in pesticide toxicology, and more recently, association with the herbicide dioxin problem largely through committees of the EPA and the National Academy of Sciences.

COLONEL THIESSEN: My name is Thiessen. I represent the Department of Defense, and in everyday life I am Director of Occupational and Environmental Health at the Army Environmental Hygiene Agency.

My interest in herbicides is relatively recent. I was involved as technical adviser to the Defense Logistics Agency in the disposal of Herbicide Orange.

I would like to make the statement that I do represent a large agency. I do not hold that I know all the details of the investigations that are going on and the discussions that are going on in the Department of Defense.

Of course, I will be glad to act as a focal point and get you all the answers that you need out of the Department of Defense.

DR. HABER: Thank you. As an Advisory Committee, the most important of our efforts is to secure information, but I must also inform you that we have a Steering Committee in the Veterans Administration which gives us direct advice.

Its Chairman is Dr. Richard Levinson, --would you stand when identified--who is Deputy for Clinical Support Services; Dr. John Castellot on the Committee who is Director of our Medical Service, a Vietnam veteran and a
veteran of Korea as well—just Vietnam; Ms. Margaret Kilduff of the administrative staff at the library to give us advice about the library; Mr. Donald Howell, representing Ms. Dinunzio, Office of Management Services, and Dr. Paul LeGolvan, Pathology Service; Dr. Lyndon Lee of the Veterans Administration who is in charge of one of our research programs; Mr. Tim Conway representing the General Counsel; and Mr. Charles Peckarsky, Director of Compensation and Pension Services, Department of Veterans Benefits.

I would like to call to your attention a couple of people who are going to be helping us—Ms. Williams, who labored mightily to produce this volume of paper and who will help us process the material as we go along.

I would like to charge the Committee and to give you some information about what I think our job is and some information about the way in which we will proceed.

I would like to call your attention to the fact that this Advisory Committee has been duly recognized and registered, complying with all the rules and regulations attendant upon such committees, and has been duly published in "The Federal Register," and future meetings will be advertised in "The Federal Register" to apprise all concerned of the occurrence of such meetings.

Let me read briefly from the charter of this Committee. The official designation is Advisory Committee on Health-Related Effects of Herbicides, and I will briefly read this.

"It has recently been brought to light that
enormous quantities of herbicidal chemicals were used
during the Vietnam War, and that there is a possibility
that large numbers of Americans, many of whom now qualify
as veterans, may have encountered these chemicals to an
extent that long-range, significant health problems may have
been initiated.

There is considerable controversy in the published
literature and it is probable that much information remains
unpublished.

The Veterans Administration has not previously
been required to resolve toxicological issues of such a
complex and highly controversial nature.

The Committee will, therefore, assemble and analyze
the information which the Veterans Administration needs in
order to formulate appropriate medical policy and procedures
in the interests of the involved veterans.

The Committee will have an entirely fact finding
and advisory role and will not be required to develop policy.
The Committee will adhere to all the provisions of U. S.
Public Law No. 92-463, 5 U.S.C. App. I, Executive Order
12024, and Presidential Circular A-63 of March 27, 1974,
and subsequent applicable revisions.

It is anticipated that the Committee may achieve
its objectives within 24 calendar months. However, if an
extension is needed, this will be properly negotiated.

The Committee will report to the Chief Medical
Director, Dr. Crutcher, through the Assistant Chief Medical
Director for Professional Services.
The Agency responsibility for providing the necessary support is the Veterans Administration, and the duties and functions will be quarterly sessions at the Veterans Administration Central Office in accordance with an appropriate schedule of dates set at the preceding meetings.

We will publish a structured agenda. This meeting will be entirely open today. It is likely that subsequent meetings will have both an open and a closed portion.

I would like to give you a few bits of information now about procedure. As published in "The Federal Register," we will adhere to our agenda. If revisions of that agenda are necessary, I will call those to the attention of the group.

We will go through presentations this morning, beginning with a presentation by Dr. Levinson on the Steering Committee, a statement of where we are on herbicide research in the Department of Medicine and Surgery, and we will then ask for individual reports beginning at eleven from the members of the Advisory Committee, brief statements of what your agency or office is doing with respect to herbicides, and the determination of their toxicity.

This will continue through the afternoon. We will have an hour and a half break for lunch, and then there will be the presentation and discussion of written questions from the VA Steering Committee to the Advisory Committee. Our Steering Committee has prepared some questions to which they want the Advisory Committee to relate,
and these will be announced so that everybody can hear.

Then we will get written questions from the floor. There will be time for a few statements from people from the floor, and we will begin that at three o'clock. It is expected that our Administrator, Mr. Cleland, will join us sometime later this afternoon, and he may wish to address those questions himself.

I would like to tell you that we encourage any questions of this group that you may wish to submit. We would like those questions written, and they should be submitted to Mrs. Grace Meyer in the back of the room, and we will then read these at three o'clock. I will read those, and there may be time, as I say, for a few statements.

All of these questions will be answered. All of those that require answers of a general nature will be answered, and they will be answered through a mechanism which I would like to outline, by the members of this Advisory Committee, and that will be done through small task forces. If there is a particular area of expertise in pathology or carcinogenesis we would ask the official member of the Committee to help us prepare a paper in answer to that, a position paper.

Obviously that can't be done today. It will take weeks and so on, and my office will endeavor to provide assistance in framing those answers, or we will prepare the paper itself, and then circulate it among the Advisory Committee for its answer.

The results of those papers will be available to
the public, and we will make it possible so that any question, any legitimate question which is posed to this group can receive a duly considered written answer which will represent the findings of this Advisory Committee.

Let me then briefly charge you. You are I hope impressed, as I am, with the fact that this does represent a multi-disciplinary group; many kinds of professional, scientific and technical expertise are represented in the group.

It is also a multi-disciplinary group from the standpoint of advocacy. There will be various shades of conviction about the possible connection between herbicides and long-term pathogenesis. Some of the Advisory Committee have already distinguished themselves for having contributed significant works to this body of literature, and I think that we will hope out of this enlightened discussion to arrive at the answer.

We in the Veterans Administration consider this a matter of extreme seriousness. The potential link between exposure to herbicides and long-term pathological effects is something that has seized the public interest, we think rightly, and has consumed a prodigious amount of our own time and expertise.

We are grateful to the agencies and organizations represented around this table for their willingness and commitment to help us find these very illusive answers, and the answers let me assure you are illusive.

We are well aware of the fact that a tremendous
amount of literature has been produced. We refer to the classic study of the National Academy of Sciences in 1974 accomplished with great input from a variety of disciplines and viewpoints which did not definitely come up with any evidence of long-term pathological effects in humans upon exposure to dioxin and the herbicides.

A subsequent study mounted by the United States Air Force, which was completed last October I believe and announced by General Dettinger at a hearing before the House Veterans Affairs Committee looking into this subject similarly failed to come up with hard evidence of the fact that there was a relationship between exposure to dioxin and long-term pathological effects in humans.

Nonetheless, the controversy continues in the minds of many. The definitive answers are not yet in, and I think that must, therefore, characterize my charge to the Advisory Committee. Many are not yet convinced that such a link between exposure and pathology does or does not exist, and we have, therefore, to address ourselves mindful of all the research that has been done heretofore, but perfectly willing to take a fresh, a new look at the evidence already in the files or that may yet be adduced by appropriate research or introspect.

The Veterans Administration has been concerned with this for the past 15 months, and we continue to be concerned. Our efforts in this regard can be summarized under four headings. One is to acquire and exchange information. This Advisory Committee is the keystone in
that process.

Secondly, to disseminate such information to all of our field installations, hospitals and regional offices alike.

Thirdly, to build and maintain a complete record and registry of all veterans about whom we know or who come to us for treatment, or for adjudication of claims for compensation.

Finally, to conduct and offer assistance into further research into this area. All of our efforts, and there have been many, come under one or another of those headings.

It has been said that the democratic principles in which one is presumed innocent until proven guilty should not apply to chemicals, that is to say, that dioxin should not be believed to be innocent of pathological effects until proven guilty, and that certainly is true, but I would urge all of us to remember that the Veterans Administration cannot undo what history has done. Try as we will, we cannot reverse the fact that dioxin is a contaminant and was sprayed on the fields of Vietnam, and what we now have to do is not to lament that fact, but to consider whether or not that spraying did carry with it the possibility of long-term pathological effects.

We know, of course, that dioxin is extremely toxic in acute situations. There is no question about that, and we are well minded on that issue, but whether or not it does produce long-term effects is something that does
concern us, and we have to go on about it.

We have got to establish that there is a clear link between pathology and long-term pathologic effects. We must weigh the evidence. We must consider all the information. We must conduct a scientific inquiry, although this is a subject on which emotion swirls about us, and we are all concerned about the plight of Vietnam veterans, and if such a link is established, we want clearly to act on it quickly, prodigiously, and in the appropriate fashion.

We must not be projected into establishing such a link until it has been made clearly evident through scientific inquiry.

We want to excite new research if that is necessary for the Committee. We want to advise the Chief Medical Director and the Administrator, and indeed the whole country. I need scarcely tell you that this has seized the popular imagination, and the public press has paid a great deal of attention to this issue.

We want to provide answers to the questions. I would like to say that one thing which I find reassuring in all this is that at least in the Veterans Administration, the Department of Medicine and Surgery, we are not waiting for the answers in order to treat people. That is to say, if veterans come forward exhibiting pathology or having symptoms, we would treat them if they are otherwise eligible immediately. We do not wait for the deliberations of this Committee in order to diagnose and treat. An individual
complaining of carcinoma would be treated in the Veterans Administration whether that was due to prolonged use of tobacco or exposure to other agents, or exposure to Agent Orange, so that that decision we don't have to make.

Anybody who is now ill, whatever the cause, if eligible for treatment, would be treated. That does not minimize the importance of our finding the possibility of such links, and in a way, gives us only temporary respite from the tremendous responsibility thrust upon us.

That concludes my charge to the Committee. I would urge you all to read again the "Federal Register" to familiarize yourself with the particulars, and I think now we will move ahead with the summary of the VA Steering Committee's activity.

Tell us where we are in the Steering Committee's activities.

DR. LEVINSON: Thank you. I will stick to the time schedule, but during this period, I would like to introduce, or at least call for brief remarks from members of the Steering Committee who are most expert in the particular aspects that I mention.

First of all, the Steering Committee was formed last June at the time when the VA became aware that there was a major problem concerning the possibility of herbicide toxicity among Vietnam veterans, and recognized the fact that our response to this particular situation would have to be broad based and utilize expertise from throughout the agency.
Accordingly, the Committee was constituted with members from the Department of Medicine and Surgery, which of course is the health care delivery arm of the Agency, but also included representatives from the General Counsel, which is the legal arm, the Department of Veterans Benefits, which handles the compensation claims, as well as other matters, from Management Services, which is our administrative liaison with other agencies, and from our Research and Development Branch, which is also part of DM&S.

The Committee was charged with the task of helping the Chief Medical Director and the Administrator develop appropriate policies regarding the diagnosis of herbicide-related illnesses, the appropriate therapy that is necessary for any of the illnesses that might be discovered, and other related matters which might flow from the demonstration of a distinct connection between herbicides and permanent human disease.

This very broad-based charge was then implemented through a series of separate steps which I will describe to you briefly. Before I do that, I would like to quickly list some of the specific charges that the Committee had and which we hope to be able to fulfill before our tenure is terminated.

I mentioned that we provide advice to the DM&S management, as well as the VA-wide management on policy and actions related to the herbicides.

Second of all, we are charged with stimulating
and coordinating development to new approaches to the
evaluation and treatment of individuals who might suffer
from illnesses arising from exposure to herbicides.

Related to that, we had a very specific charge
and that was to develop a program for examination of
veterans who were potentially exposed to herbicides while
in Vietnam, and to evaluate any potential illnesses that
they may demonstrate. I will describe that more later.

We attempted also to act as a liaison not only
through our membership, but also through other actions with
the rest of the Agency both in the Central Office and in
the field, and we are available as a resource to conduct
special studies, prepare position papers, and answer
questions posed to the Administrator, the Chief Medical
Director, and others about this general matter, so we are
an interagency clearing, steering and coordinating committee.

Just a word about our program for examining
veterans. As has been said, the VA has not dealt
significantly in the past with environmental exposure, and
we have to feel our way slowly, using the best advice that
we could obtain. We will, of course, be asking this
Advisory Committee to give us additional specific directions
in this program, but what we did as a first effort was to
set up an official program for the detection and the
examination of veterans currently in our patient
population who, A, were in Vietnam during the period when
the herbicides were used, and B, claim exposure to them.

The program consisted of following the
identification of these veterans, taking a detailed medical history which also emphasized the matter of exposure to the herbicides, and then a physical examination supported by appropriate special tests which were geared to detect diseases in the organs that various people had suggested might be affected on a long-term basis by herbicides.

The number of veterans, as you can imagine, in this category was large. It soon became apparent that we would have to accumulate this data in some central source and continue following these people for a number of years to reach any kind of conclusion about their disease and its connection to herbicides, and so we proceeded to set up a registry which we are now in the process of automating to provide this long-term followup, and to provide a database for any long-term studies hopefully of a proper epidemiological and scientific nature that might arise from it.

We also are attempting with some difficulty to quantitate the exposure of these individuals to herbicides. We are doing this by utilizing the spraying tapes which are available from the Department of Defense that were used by the NAS in their earlier studies, and information about the unit histories of the ground troops who saw action in Vietnam during the period when the herbicides were used.

Our hope is to be able to match these various sources of data through the computer and to come to some kind of reasonable conclusion about the presence of a
person in Vietnam, and their exposure to herbicides.

This has proven to be an incredibly difficult matter, and we will need your help in attempting to interpret the sort of data we have. We have many, many questions about it.

We have also been involved in a coordination or stimulation sense with a series of research projects, and Dr. Hobson, a member of our Committee and the Dep't ACMD for Research and Development, will address future research in this area separately.

I might just mention that Dr. Lyndon Lee, who was introduced as a member of the Committee, has been coordinating, directing actually, our study on determining dioxin levels in fat. This, of course, was suggested as a potential diagnostic test of great significance.

We have done a pilot study. Dr. Lee has been involved in its direction, and I hope we will have a chance to hear from him briefly about this matter.

Dr. Lee, would you stand and perhaps just say a few words?

DR. LEE: My background is in general surgery and pharmacology.

In October, Dr. Haber spoke to the Committee, and Congress, and promised that there would be several and various studies, one of which was the biopsy of fat for the assay of dioxin in both exposed people and in controls.

In November, he asked me if I could coordinate this, and I agreed. We developed a protocol which went
through the usual human experimentation approvals, as well as the research committee approvals in the hospitals, four of which were in the Chicago area because of several points.

First, we had a good many applications from veterans in the Chicago area who felt they had been injured by exposure.

Second, it was felt that perhaps these people who came from the more or less urban rather than suburban or rural area might at least have had less exposure as civilians than others from the farm areas.

And lastly the men were interested and could be persuaded to follow the program.

We also added one further hospital in Lincoln, Nebraska, because that was where the chemist who was to do our assays was centered, at the university, and we needed liaison, so we added one man there.

We have approached the National Academy of Sciences National Research Council through their followup agency for statistical participation, and that is being carried out. The protocol has been approved. We now have taken biopsies from 16 individuals; 14 of these have been exposed anywhere from 13 days to 6,600 hours of documented exposure, and these biopsy reports are not yet available.

There have been two controls which have had biopsies, and there are four more individuals to be biopsied this week, two additional who have not been scheduled, and that is the report at the present time.
Obviously we have not broken the code. The various materials have been sent to the biochemist coded so that he does not know what types of exposure, if any, the individuals have had, and will be prepared I think to give a more full report on this within probably another month.

DR. LEVINSON: Thank you. May I ask Dr. LeGolvan to just say a word to you? He is the Deputy Director of our Pathology Services--to say a word or two about the program with the Armed Forces Institute of Pathology with regard to the storage of biopsy and autopsy tissues from veterans exposed to herbicides who come through our hospital.

DR. LeGOLVAN: I am a pathologist in the Pathology Service with Dr. Williams. Our negotiations with the AFIP resulted in the establishment of a registry of tissue pathology for the cases that might appear at the AFIP, and listing possible exposure to herbicides.

In this registry, any tissues that are sent to the AFIP will be so coded for future study. These cases all are such that all hospitals have been notified that any cases that appear for routine surgery of any type or for any other studies in which tissues are obtained will be sent to the AFIP for this registry.

Thank you.

DR. LEVINSON: Thank you. Another function of our Committee is to attempt to increase the understanding of particularly our professional staffs in our hospitals and clinics about the matter of herbicides and other environmental toxins, and to make them more aware of the best
ways in which to examine veterans who claim or who should perhaps be claiming possible illnesses related to these agents.

We have done this in a fairly formal way through hot lines and circulars and other publications. We are planning some major educational activities in the near future, again hopefully with the help of this Committee, the Committee's expertise to offer more detailed educational information about the appropriate matters.

We have also attempted to answer appropriately the many requests for information from the press and radio and television. In that, we have the great help of Mr. Stratton Appleman, the man sitting in the back, who is a member of our Steering Committee, and hopefully, we are increasing the amount of specific and appropriate information of the public at large through most of these news releases.

Another matter that we are concerned with is compensation. Compensation for Agent Orange related matters is the province of the Department of Veterans Benefits. One of our members, Mr. Peckarsky, is from the Department of Veterans Benefits, and I will ask him to just say a few words to you about our present status in that matter.

MR. PECKARSKY: For me, this type of session is an extreme learning process. We are fortunate in that the law, with regard to veterans benefits does not require the establishment of a causal relationship between subsequently experienced disability and any incidence of service.
In that regard, any disability that is incurred or aggravated at a coincident point of time with military service receives the status of service connection.

Nonetheless, it is important in the lapse of time that has taken place since the exposures in service that we learn as much as we can concerning the effects in the out years of exposures to dioxin. This we expect to get from our participation in this Committee's work.

DR. LEVINSON: Thank you. Just in conclusion, I would like to point out that the Steering Committee will continue to carry out its various missions and perhaps add additional ones as they appear appropriate.

In doing so, of course, we need all of the expert scientific and medical information that we can obtain on this matter towards that end. Our group compiled a series of questions which you will hear about this afternoon, in areas that we feel answers are very important, and we stand ready to assist you in any way in better carrying out your advisory function.

Thank you very much for your time.

DR. FABER: Thank you, Dr. Levinson. We really would be quite powerless to implement the advice of the Advisory Committee were it not for the existence of the Steering Committee.

We look forward to their continued input and the ability to translate some of this advice into specific rules and regulations so we in the Veterans Administration can implement the advice of this Advisory Committee.
On our agenda next is a discussion of herbicide research. I would like to introduce Dr. Lawrence Hobson. Dr. Lyndon Lee described the fat biopsy study. I would indicate to you that the basic idea for the protocol emanated from Dr. Hobson, and he might wish to tell you a little bit about what he had in mind on that, as well as what the Office of the Assistant Chief Medical Director for Research and Development will be doing to help us in the VA to research into this area.

DR. HOBSON: In a sense, I am bringing the coals to Newcastle by talking to this group since many of you are much more expert in this particular area than I am. I will just very briefly sketch why the fat biopsy program is undertaken.

The claim was made in a television interview that fat would retain dioxin for decades in an inactive form, and that anything that mobilized the fat, for example, a reduction program, during or at the end of those years, would release dioxin in the circulation and produce a problem of dioxin intoxication.

This, of course, requires that dioxin be stored in fat, and the most direct way to determine that is by a sensitive assay method to detect the dioxin.

We sought the advice of EPA as to what assay technique was best and who was the best one to apply it and were given the name of a man who had shown the best results in the sense of consistency, sensitivity, in this assay, and we, therefore, contracted with him to carry out...
the determinations in part because he had the best test and because he is not in the VA or in the federal government and therefore would not be biased in his result and we further stipulated that the samples be submitted to him blind so he has no knowledge of what exposure the individual may have.

As Dr. Lee has said, there is a variety of exposures here so that when the assays are completed, we will be able to say whether in fact it is possible to detect this material in fat, and if so, to what level, and if it is detectable, whether there is any difference in the amount of dioxin determined in the fat of individuals who had military exposure, and the balance of us who have simply been in the civilian population or were in the military but not in the areas in which it was being used.

This is not an attempt to arrive at a definitive epidemiological study at this stage of the game until we find that this most sensitive method can detect dioxin it would be rather foolish and fruitless to have a large number of people examined.

These are biopsy specimens and they require an operation so that we are not anxious to subject individuals to that to no end at all.

The other research that has been proposed to us in large part has been accomplished already. Dioxin itself and the herbicides have been the subject of extensive research, as all of you know I'm sure. The one area that has been suggested might be unique for the VA is
epidemiological studies of individuals who have been exposed.

The difficulties here, as I am sure all of you appreciate, are in the documentation of the precise level of exposure because the mere presence in Vietnam of an individual does not mean he was anywhere near the sprayed area, and presence in a sprayed area does not necessarily mean that he was there at the time when dioxin was present, so that we are really in a very difficult position in attempting to do definitive epidemiological studies of this material under those circumstances.

We feel that much better studies can be conducted in the sense of knowing at least the time, approximately the amount of exposure in industrial accidents or industrial exposures such as those that have occurred in the past, but not within the veteran group.

The one symptom or sign that seems to be generally accepted as evidence of exposure to dioxin is the appearance of chloracne, which is a skin condition.

As you know, the difficulty with using this as a criterion is that the military in most instances under field conditions did not record chloracne as a significant finding. It didn't endanger the individual's health. It was often confused with other skin conditions which were equally benign if treated, and there was not much made of it so that the record of individuals who may have had chloracne in Vietnam is really very scanty and probably nonexistent. At least we have been unable to recover them.
Lacking that, the level of exposure, the amount of material to which the individual was exposed, let alone absorbed, is a matter of conjecture and we are not going around and exposing people to highly toxic material in an attempt to find out what is going to happen to them, so that we are quite handicapped.

I would raise one other point here which I am afraid is a very negative one and rather unpopular with known scientists, and that is that scientists are not all-powerful. We can't do everything. One of the things we can't do is to prove a negative. We can't say that something did not or cannot occur, and yet we are constantly being asked a question which is a very reasonable one in lay terms, namely, prove that nothing did happen or that nothing can happen, that you can't get cancer from this or you won't get sick from that.

This is, as I said, scientifically impossible to do. Let me demonstrate that very, very briefly. If you examine 100 people, and none of them had an effect, for whatever reason, you can say well, there was no effect, but somebody can say, but the 101st man may have got it, so you do 1,000, and you still don't find any effect, and they say well, but the 1001 may have got it, and you can continue this kind of endless chain in perpetuity and never be able to say that it cannot happen.

The best you can hope to do is to say that there is less than a certain chance that it would happen, not that it cannot.
The result of whatever kind of scientific studies that are carried out are going to be couched in terms that are going to disappoint some people because it will not say flatly that a certain thing did not or could not appear.

I think you have to keep this in mind when you look at research plans and research that has been conducted and not expect that you are going to get a flat answer that it cannot or won't happen.

We are at the present time dependent on an epidemiological study on the identification of individuals who were presumably, and with a strong level of presumption, exposed to dioxin, where there are certain groups where we know that was true; people who handled the defoliants and who were not particularly careful about it undoubtedly got exposed to the defoliant, and presumably to dioxin.

People who went into areas where the spraying had been done were only presumptively exposed, and it will probably wind up that that is the best epidemiological group we can find, but it is rather unsatisfactory from the scientific point of view, and it certainly will not, as no other study would do, establish the negative if we find that there is no ill effect in whatever group it is that we examine.

DR. HABER: Thank you very much. Dr. Hobson has been the recipient of a memorandum from me asking that our Research and Development Service consider the likelihood of other kinds of research, and we will be getting an answer.
from him and their own advisory committee as to the feasibility, likelihood, and necessity of the Veterans Administration initiating additional studies in certain specific areas that were suggested to him.

We look forward to his continued operation and cooperation in this activity.

I would like to call attention to the presence of Dr. Stephenson representing Dr. Griffith from the EPA, and we welcome you, Dr. Stephenson.

DR. STEPHENSON: Thank you.

DR. MOORE: Dr. Haber, may we interrupt for questions?

DR. HABER: I think that what I would like to suggest is that if you have procedural questions, any time is appropriate. If they are substantive questions, I would like to delay that until either your presentation, which we are about to ask for now, or until the time for the questions.

DR. MOORE: It is a question that is prompted by the presentation. I will pose the question and if you want to hold it, fine.

DR. HABER: Yes.

DR. MOORE: With regard to the biopsy specimens that have been taken and that have been coded to be analyzed, is it possible to find out what levels of detection they are going to attempt to look for, PCD or put in positive controls of that type? Is that type of information available, or can it be made available?
DR. HABER: I would defer that to Dr. Lee.

DR. LEE: The level at which they can determine the presence of dioxin is one part in a trillion. They will report in units, giving us an idea, if there are any dioxin units present, how many these may be against controls which obviously may themselves show dioxin levels, but we are not certain about that.

DR. HABER: Okay. I think this question needs to be dealt with more fully, and we will this afternoon. I quite agree. I think at this juncture now we would like to go around the table and begin the process of reporting.

We will not be able to observe the alphabetical regularity with which we asked you to be seated because some of you have to leave earlier.

I would like to ask you to take 10 minutes or 15 minutes if that is required for the purpose of giving us a brief on where your particular agency or office is at this point, and I think also what questions you would like to see this group address as well, and in brief to let us know where you come from and to share with us a summary of your experience.

As I indicated, since some of you will have to leave earlier, I would ask your forebearance in departing from the otherwise assigned alphabetical listing, and with that, I would like to ask Dr. Brick representing the American Legion, and himself, to begin.

Dr. Brick, would you tell us what you are doing and what you would like to see solved in this area?
DR. BRICK: I am interested in the general problem of the long-term effects of dioxin as outlined in the charge to the Committee.

Representing the American Legion, we are interested in that particularly from the point of view of the compensation angle which is represented here by Mr. Peckarsky, and as he pointed out, he is interested, too, to know whether these problems are real, imagined, what the extent of the problems is, and that type of thing.

From a professional point of view, I am particularly interested in the effect of dioxin and its effects on the liver and whether or not any of the liver diseases that we commonly encounter have anything to do with the exposure that may have been obtained in Vietnam.

I am not as familiar with the literature as some of the experts here. I don't pretend to be, and have a question about whether or not the National Academy of Science's report, and the Air Force report might be made available to some of us in the Committee who have not seen these reports. I think that might be helpful.

Also a question, Dr. Haber--minutes are being taken of this meeting, and will they be available to the members of this Committee?

DR. HABER: Absolutely.

DR. BRICK: Not all of us are going to be present at all of the meetings, and/or all of the meetings in toto, and if such materials are made timely available to us, I am sure that many of us will, in our own leisure, study these
and have questions and possibly some suggestions.

That is the end of my presentation.

DR. HABER: Okay. Dr. Moore, I understand you may have to leave. Would you, therefore, please address us and tell us what you have been doing and what questions you would like to see answered and so on?

DR. MOORE: As I mentioned in introducing myself, we have done work with tetrachlorodibenzo-p-dioxin, TCDD, and other dioxins for nine or ten years.

Our original work was trying to establish whether or not the benzodioxins can produce teratogenesis or other effects, or birth defects.

Since that time, we have tried to look into the types of effects that the benzodioxins may cause. We have not restricted ourselves to TCDD. Indeed, TCDD is but one member of a family of dioxins, others of which can cause toxicity.

I would like to point out to the Committee's attention if they are not aware of it, the evidence that is accruing over the last few years is clearly showing that a variety of chemicals that are called halogenated hydrocarbons may have the same target site for whatever effect they do produce, and so therefore, if one is looking for illness as a consequence of dioxin exposure, the expression of that illness may be a total insult, if you will, from TCDD, other dioxins, chlorinated dibenzofurans, possibly azoxybenzines, hydrochlorinated biphenyls. In other words, you can't consider TCDD exposure in a vacuum.
is basically what I am saying.

I would like to point out two publications that have not been mentioned heretofore, and I think the Committee should be aware of their existence and may want to look at them.

One is a publication that came out of Sweden which is a culmination of a conference which was hosted by the Royal Swedish Academy of Sciences two years ago on chlorinated acids and their dioxins.

Aside from wanting to look at the recommendations that the various groups may have had in there, it is a fairly up-to-date background reference to what is in the literature and what may or may not be of interest.

DR. HABER: We are in debt to you for bringing that to our attention. I would hope that others of you, if you know of significant publications would bring them to our attention. We will try to make them available if we can.

DR. MOORE: The second one is much briefer in size, and it is a technical report of a meeting that was held in January of 1978 in Lyon, France under the sponsorship of the National Institute of Environmental Health Sciences and the International Agency on Research in Cancer, which is part of the WHO.

The one-week meeting was to in essence see if one could come to grips with the long-term hazards of polychlorinated dibenzodioxins and polychlorinated dibenzofurans. There are some recommendations in this, but aside from...
the recommendations, I would again urge the Committee
members to look at this as well because it does give a
fairly good summary of the previous occupational exposures,
the date they occurred, the numbers of populations that
were involved in the exposures, and what is the current
monitoring aspects of them, and I also tend to feel that
if one is going to get insight fairly soon as to the chronic
effects of exposure to dioxins or herbicides, it is going
to be from some of these worker populations where their
exposures are now approaching 20 to 30 years.

Unfortunately, the numbers are very small.

DR. HABER: Dr. Moore, is it fair to ask is your
office engaged in any of those long-term follow-up studies
now underway, the group at Nitro, or have you any input
into that?

DR. MOORE: Indirectly. The Nitro, West Virginia
group that was followed up, the clinical examination
I believe, at least in part was done by the Mount Sinai
School of Medicine, which is funded through our grant program.

DR. HABER: You will be getting those answers,
will you not?

DR. MOORE: Yes. I believe NIEHS has a formal
affiliation.

DR. HABER: That is one of the things I would
like to do, to try to pinpoint who would be likely to
find out.

Thank you very much, and we are indebted to you
for calling those publications to our attention.
I think next, Dr. Thiessen, if you would be
good enough to address us and we would like particularly
if you can help us with that information, I understand
your earlier statement about the complexity of the
Department of Defense's research assistance on this, but if
you can give us any information about the Air Force projected
study, that would be most helpful.

COL. THIessen: Let me again reiterate that I
am not familiar with the details of the Air Force study.
The Air Force has been so kind as to give me
a general statement that I would like to read into the
record.

Let me make it clear that the Department of Defense
intends to and has in some cases involved institutes such
as the Armed Forces Institute of Pathology that has been
mentioned before. The Armed Forces Epidemiology Board
will discuss the study protocol that is being developed by
the Air Force.

The study protocol will be brought before this
Committee for at least advice, if not approval, and all
these actions should take place pretty shortly, if they
haven't taken place already.

Now the Air Force will conduct a study of the
health of Ranch Hand personnel involved in the aerial spraying
of Herbicide Orange in Vietnam. Operation Ranch Hand was
a code name attached to the Air Force air crews between
1962 and 1971, when the operation ceased.

These personnel would have been the most likely
to have had significant exposure.

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

The study will involve both veterans and active duty personnel; former Ranch Hand personnel exposed to Herbicide Orange, approximately 1200, will be carefully matched to a control group not exposed. Detailed telephone health surveys will be given all members of the study beginning in early October 1979. Comprehensive physical examinations will be given to a selected number of both exposed and non-exposed individuals. Health surveys and scheduled physical examinations of selected individuals will be conducted for a minimum of six years to see if any long-term health problems emerge.

The entire study will be completely reviewed by both government and civilian scientific personnel. This is to preclude any bias, and to ensure the scientific validity of this complex project.

The study details, as I said, will be presented to this Committee during this review cycle.

That concludes my statement.

DR. HABER: I would like to suggest to the Committee that in a prior meeting that I had with General Dettinger on the study, I asked of him permission for this Committee, this Advisory Committee, to get the protocol, which was granted, so when that protocol is delivered to us
we will circulate it among the Committee. I think this is really only in the interest of scientific exchange, though some of you may have some suggestions about this and possible suggestions of revision of the protocol which I think would have to be done fairly soon if we were going to do anything about it, but I must tell you the Department of Defense and the Air Force have their own scientific review process, and it strikes me that they are well along in this process.

Isn't that right?

COL. THIESSEN: Yes.

DR. HABER: What are the bodies that would review this?


DR. HABER: Then it will have been subjected to at least two prior in-depth reviews, but I asked for the opportunity for our group to see it and review it, and I think we should avail ourselves of that. In some subsequent meeting, you may wish to go on record individually or collectively as, hopefully, approving the study.

COL. THIESSEN: Let me also state for the record, sir, that the Armed Forces Epidemiology Board does not consist of Army representatives, but of national experts.

DR. HABER: I am well aware of that, and
General Dettinger was quite informative on that subject.

Okay. I think with those presentations, we ought to now proceed to ask the other members of the group in alphabetical order. Dr. Allen, I guess that puts you up first. Will you please tell us where you are in your research and what your plans are and what you would like for us to help you with if we can?

DR. ALLEN: I would like to say that I am an experimentalist. I have done no research at all on human populations that have been exposed to dioxins. I have done no research on Agent Orange per se. My research has been limited primarily to the tetrachlorinated dibenzodioxins and their effects on non-human primates, the Rhesus monkey and on rodent populations, primarily the laboratory rat.

We have found that a relatively low level of exposure to the dioxins, namely, TCDD, is extremely toxic. In some of our initial studies, we found that levels, when consumed at 500 parts per trillion in the diet for a period of nine months, produced mortality in over 50 percent of the experimental animals.

Within a period of three months, the animals began to lose their hair, had swollen eyelids, dry, scaly skin, and indications of hematological abnormalities.

At these levels of exposure they had consumed in the neighborhood of 1 microgram per kilogram of body weight.

By the sixth month of exposure, and after having
consumed in the neighborhood of 2 micrograms per kilogram of body weight, the animals developed what we would consider a severe pancytopenia, decrease in circulating white cells and red blood cells, and a marked decrease in blood platelets.

At this time, we attempted to breed the eight experimental animals; three of the eight became pregnant. Two aborted early in gestation, which is an indication or suggestion of difficulties that we have observed in other studies, in the halogenated hydrocarbons and its effect upon the reproductive capability.

At seven months of exposure, we lost our first experimental animal primarily due to excessive bleeding all over the body. By the ninth month, we had lost our second animal due to widespread hemorrhage, and by the 12th month, we took the animals off the experimental diet.

At nine months, they had consumed in the neighborhood of between 2 and a half to 3 micrograms per kilogram of body weight.

During the succeeding three months up to the 12th month, we had lost three additional animals, making a total of five of the eight experimental animals that died from dioxin intoxication.

Some of the more pertinent lesions that we found in these experimental animals, in addition to the loss of hair, loss of eyelashes, swollen eyelids, dry, scaly skin, keratinized hair follicles, there was a marked thickening of the gastric mucosa, ulceration. There was marked dilatation of the gall bladder, and hypertrophy.
and dysplasia of the epithelium of the gall bladder, as well as the common, cystic and hepatic ducts and the bile ducts within the hepatic tissue.

There were hypoplasia and metaplasia and dysplasia in the sebaceous glands, the salivary glands, metaplasia and hyperplasia of the transitional epithelium of the urinary bladder, and also metaplasia and hyperplasia of the lining of the mucosa of the stomach.

In subsequent studies, we have reduced the level of dioxin in our experimental diets to 50 parts per trillion. These animals now have been on this diet for over two years. After six months of exposure and after having consumed in the neighborhood of about 3 tenths of a microgram per kilogram of body weight, we attempted to breed the experimental animals.

Of the eight experimental animals, six became pregnant. Four aborted early in gestation, and two were able to carry their infants to term, thus further clarifying or substantiating the observation of the effect of dioxin upon the reproductive capability of non-human primates.

The animals have been on the diet for approximately two years. They have consumed in the neighborhood of one microgram per kilogram of body weight, and are beginning to show the same signs and lesions that developed in the 500 parts per trillion animal of three months, both groups having consumed in the neighborhood of one microgram per kilogram of body weight.

Thus in these studies it would appear that there
are very distinct changes that occur. When the levels of exposure to the dioxins are higher some changes occur much more rapidly than when the level of exposure is quite low.

It would appear that the same effects develop in the experimental animals, regardless of the time that is required, whether it be three months at 500 parts per trillion, or at 50 parts per trillion over a two year period.

This pretty well brings you up to date as to what are the effects that we have observed in our non-human primates. We now have studies that are on going where we are feeding animals 25 parts per trillion of tetrachlorodibenzodioxins. They are being bred at the present time to determine if these levels will have effects upon the reproductive capability, and the general body health of these experimental animals.

I would like to mention just briefly our preliminary work with the possible carcinogenic effects of the tetrachlorodibenzodioxin. We did a pilot study approximately three years ago where we had fed rats levels of dioxin ranging between 5 parts per billion and 5 parts per trillion.

Those animals that died during the course of the experiment had approximately a 37 percent overall incidence of tumors. Those that were sacrificed after two years on the diet had approximately a 36 percent incidence, overall incidence of tumors.

The tumors that were observed were quite variable,
involving the liver and the lung. Those two organs were the more severely affected.

These observations have been substantiated at a somewhat higher level by the Dow Chemical Company scientists and certainly there are indications from the Illinois Institute of Technology that there are carcinogenic effects of tetrachlorodibenzodioxin.

Recent reports at the American Association for Cancer Research meetings in New Orleans strongly indicated the promotional activities of the tetrachlorodibenzodioxins on cancer. Thus it would appear that we are working with an extremely toxic compound that has widespread effect on experimental animals.

DR. HABER: Thank you. I am sure there will be questions about it this afternoon. We would like to ask you to elaborate.

DR. ALLEN: In our evaluations of populations that have been exposed to dioxin I do not think that we can eliminate those that have been chronically exposed or have low-level exposure.

In work done at the National Institute of Environmental Health Sciences, they were able to show that some of the same signs and lesions were produced at levels of 70 micrograms per kilogram of body weight that we observed in the neighborhood at levels of 2 to 3 micrograms per kilogram of body weight over an extended period of time.

There may be heavy exposure which produces the effect, but this does not eliminate the possibility of low-
level exposure that may occur over an extended period of
time that may produce this same effect, and these are what
I consider extremely pertinent points, and I have received
unofficial reports since, that in some of the peripheral
areas that are involved, some of the people are beginning
to show ill effects that were not observed in the more
acutely exposed areas.

DR. HABER: Thank you, Dr. Allen. We certainly
appreciate your statement.

I would like to move on. Dr. Erickson, can you
please tell us what your laboratory has been doing and
can you shed any light on this problem for us?

DR. ERICKSON: As I said when we introduced
ourselves, I come from a group that is interested in the
occurrence of birth defects in humans.

We have no experience whatsoever in dealing with
this problem from the angle of herbicides. We got into
the business that we are in, I think, because of another
environmental exposure—that was thalidomide. There was a
good deal of interest generated in the early '60's by the
disaster which happened in Europe and in the other parts
of the world, the epidemic of limb reduction deformities
that were a result of maternal ingestion of thalidomide.

This epidemic wasn't discovered until a few
years after it began, and the people got the idea if there
were monitoring programs in place that the epidemic of this
thalidomide syndrome babies would have been discovered
earlier, and so at the Center for Disease Control, we