GLENN BROWN, et al.
v. MONSANTO COMPANY

DEPOSITION OF R. EMMET KELLY, M.D.
TAKEN MAY 31, 1990 - VOL. I

IN THE CIRCUIT COURT OF THE COUNTY OF ST. LOUIS

STATE OF MISSOURI

GLENN BROWN, et al,	)	
	)	
Plaintiffs,	)	
	)	
vs.	)	Cause No. 862-00694
	)	
MONSANTO COMPANY,	)	
	)	
Defendant.	)	

Volume I
Deposition of R. EMMET KELLY, M.D.
On behalf of Defendant
May 31, 1990

WALLER REPORTING, INC.
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MONSANTO COMPANY,	)	
	)	
Defendant.	)	

DEPOSITION OF R. EMMET KELLY, M.D., produced, sworn and examined on behalf of the Defendant, May 31, 1990, between the hours of eight o'clock in the forenoon and five o'clock in the afternoon of that day, at the offices of Communitronics, 1907 S. Kingshighway, St. Louis, Missouri, before TOD MINNIGERODE, a Certified Shorthand Reporter and a Notary Public within and for the State of Missouri.

A P P E A R A N C E S

The Plaintiff was represented by Mr. Thomas M. Carney of the law firm of Husch, Eppenberger, Donohue, Cornfeld & Jenkins, 100 N. Broadway, St. Louis, MO 63101.

The Defendant was represented by Mr. David McCrea, McCrea & McCrea, 119 South Walnut Street, Bloomington, Indiana 47402.

IT IS HEREBY STIPULATED AND AGREED by and between Counsel for the Plaintiff and Counsel for the Defendant, that this deposition may be taken in shorthand by TOD MINNIGERODE, a Certified Shorthand Reporter and Notary Public, and afterwards transcribed into typewriting, and the deposition to be continued by agreement of counsel and consent of the witness.

o-O-o

R. EMMET KELLY, M.D.,

of lawful age, being produced, sworn and examined on the part of the Defendant, deposes and says:

EXAMINATION

QUESTIONS BY MR. CARNEY:

Q. Would you state your name please for the record?

A. R. Emmet Kelly, M.D.

Q. Dr. Kelly, my name is Tom Carney, and I represent Monsanto and I'll be asking you some questions, and after I'm finished, Mr. McCrea, who's sitting here to my right will undoubtedly ask you some questions on behalf of the plaintiffs in this case.

Where do you live, Dr. Kelly?

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A. 665 South Skinker, St. Louis, Missouri 63105.
Q. And how long have you lived in St. Louis at that address?
A. About fifteen years.
Q. And how long have you lived in St. Louis?
A. All my life with the exception of four years in the service.
Q. And are you married?
A. Yes.
Q. And do you have children?
A. Yes.
Q. How many children?
A. Six.
Q. And are you a medical doctor?
A. Yes, I am.
Q. Dr. Kelly, could you tell the jury if you've ever been employed by Monsanto?
A. Yes. I've been employed by Monsanto since January of 1936. I was first employed as a physician at their plant in St. Louis at 1700 South Second Street. Afterwards I began doing some work for Monsanto as an extension of my plant duties by taking care of some problems at other locations outside of St. Louis. I was sort of a medical director without portfolio from the years 1938 until 1942 when I went in the service. When I

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came back from --

Q. Excuse me. By medical director without portfolio do you mean that you were actually the director without the title?

A. Didn't have the title and probably didn't have all the powers that I would have had had I been a full-fledged medical director.

Q. Okay.

A. They did not have a medical director at that time.

Q. Okay.

A. So when I came back in 1946 the central medical department was established and I was made their medical director.

Q. And you were medical director from 1946 then, you had the title of medical director at Monsanto from 1946 until how long?

A. Till 19 -- November the 30th, 1974, when I retired and I spent the years as a paid consultant for a twelve month period and then I had no further formal connection with them although I have done some work for them on a fee for service basis.

Q. So you've been employed by Monsanto then -- you were employed for approximately forty years?

A. Yes. Thirty-eight to be exact, I believe.

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Q. Doctor, could you tell the jury what your professional educational background has been?

A. Yes. I was -- received the Bachelor of Science degree in medicine from St. Louis University in 1930 and the M.D. degree from the same institution in 1932. I spent three years of postgraduate training at St. Louis City Hospital, first as an intern then as an assistant resident and finally as a resident in medicine at St. Louis City Hospital. I have taken numerous and participated in short courses in industrial medicine as well as internal medicine since that time.

Q. For what period of time have you been licensed by the State of Missouri as a medical doctor authorized to practice in the State of Missouri?

A. Since 1933.

Q. And are you licensed to practice medicine in the State of Illinois?

A. Yes.

Q. Doctor, are you board certified in any areas of medical specialty?

A. Yes. I am board certified in internal medicine and recertified in that same specialty. I'm board certified in preventive medicine under the subspecialty of occupational medicine. There is no recertification program for occupational medicine.

Q. To become board certified could you tell the jury what that means?

A. Well, yes, it means that you have to have a certain amount of training. It means then that you have to be recognized in your locality as a specialist in that, devoting your time to that particular specialty. You have to take a series of examinations which may be two days or three days, and if you successfully pass those you will receive a certificate which is recognized by the other professional societies such as the A.M.A. and your confers in the various specialties. There's specialties in internal medicine, surgery and almost any particular field you might want to name, probably twenty different boards.

Q. You said one of your specialties is where you're board certified is internal medicine, could you indicates what that is?

A. Well, internal medicine is that part of medicine that holds itself to the non-surgical treatment of people past the pediatric age. It encompasses the general range of medical problems that individuals have that are treated by extrasurgical means. It does not include specialties like neurology or skin, dermatology, which takes care of the skin.

Q. And the other specialty that you have is occupational medicine, can you indicate what that is?

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A. Occupational medicine is that part of medicine that devotes itself to the diagnosis and treatment of any occupational illnesses and prevention of illnesses either in the worker's work environment or in the environment generally.

Q. Can you briefly summarize, Doctor, the hospitals you were on the staff of and any teaching positions you hold or have held?

A. Well, I have held an emeritus position now at St. Louis University Medical School. I was assistant professor of clinical medicine at St. Louis University. I was assistant professor in community medicine, also at St. Louis University, and I am an emeritus in those two fields, those two positions. I'm a member of the staff of the St. Louis University Health Center Hospitals, St. Mary's Health Center and St. John's Health Center, all in St. Louis.

Q. Have you given any lectures at any other universities other than the local universities?

A. Well, yes. I've lectured at St. Louis University, I have lectured -- that's my primary place. I have given individual lectures at the University of Cincinnati, Harvard, Baylor, Washington University.

Q. Have you published any articles on medical subjects in various journals?

A. Probably five or six.

Q. Could you list the journals where you've -- medical journals where you've published articles?

A. One was in the Missouri State Medical Journal, one was the American Journal of Public Health, one was the National Cancer Institute, one was the New England Journal of Medicine and one was the American Journal of Neurology.

Q. Could you briefly summarize some of the professional organizations that you've belonged to?

A. Well, they are the usual organizations like the St. Louis Medical Society, the Missouri Medical Association, the American Medical Association. Then there are the specialty groups, the American College of Physicians, the American Heart Association. Then there are the occupational positions, one -- Societies like the Industrial Medical Association, the American Academy of Occupational Medicine, American Society for Pharmacology and Clinical Therapeutics.

Q. Have you held any offices in any professional societies?

A. Well, I was a vice-chairman of the American College of the American Therapeutic Society which then to be joined to the American Society for Clinical Pharmacology. I was a councilor of the Industrial Medical

Association. I was president of the St. Louis Cardiac Club.

Q. How old a man are you, Dr. Kelly?

A. I'm eighty.

Q. Are you still active in the practice of medicine?

A. Not in the practice, but if you refer to that treatment of -- the ongoing treatment, I see cases for in consultation for people who may or may not be -- have an occupational medical condition. I'm a consultant with the Barnes/Sutter Health Service, which is associated with Washington University, and there I see cases that may have occupational illness or there may be cases, can this man work because he has heart disease? Does heart disease keep him from working? But as far as ongoing -- and also I do some examinations for legal cases like this one.

Q. You first started working at Monsanto in 1936, could you indicate what your job duties were when you started with Monsanto?

A. Yes. I was the plant physician, that was a plant of about 1300 people or 1400 people and I carried out an examination program, when one was in effect at that time, and this was for -- Then I was -- my responsibility was to diagnose and treat any occupational conditions that might arise, whether that might be pulmonary irritation or

skin problems or anything else, as well as take care of the injuries. Of course, if we had a broken bone I didn't take care of that, I referred that on to an appropriate specialist.

Q. And then after a couple of years when you started taking on some of the responsibilities of a medical director could you indicate what those responsibilities were for us please?

A. Yes. When I started at Monsanto it was a relatively small company, with seven or eight plants. They grew by developing new products and by acquiring other companies. When they developed new products they would have problems that were associated with it, potential problems. For example, a person when they started making elemental phosphorus, this was a German development and they were going to do this in Tennessee, so they looked at this bunch of medical information they received from Germany and said, "What do we do with it?"

Then somebody remembered they had a doctor across the street down at the Queeny plant or the plant that I was a company physician at. So they asked me to look it over, this literature, so I said, well, I have to go down and see the plant. So from then on it just grew. Whenever a problem came up, it was referred to me as a sort of fire fighting type of arrangement.

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After about 1938 I said well, if I'm going to be doing this I better be going around and see all the plants and see what you got, rather than wait until a problem surfaces and you call me, so that's what I meant when I went around it was with the full backing of the executive group of the company, but it wasn't a hundred percent official.

Q. And then in 1942 you went the into the Army during World War Two?

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

Q. What branch of the military did you serve in World War Two?

A. Medical service. I was in Army Medical Corps, but I was posted to the chemical warfare service installation. The first was at Pine Bluff, Arkansas, where they made war gases, fill phosphorus bombs, filled bombs with napalm, the whole battery of chemical warfare agents. After about eighteen months there I was transferred to the chemical warfare center at Edgewood, Maryland, which is a larger group where they were working with nerve gases and other things.

Q. Could you tell me what ranks you had in the Army?

A. Yes. I was a captain when I went in and a Lt. Colonel when I came out.

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Q. And upon your discharge what type of discharge did you have from the Army?

A. Well, when you're an officer you don't get a discharge. I was in the reserves and it took me about a year to resign. So I was put on inactive duty but being in the reserves I had to -- I thought I had enough service and I resigned, and after a year they okayed it.

Q. But it was an honorable discharge?

A. Oh, yes, it was honorable.

Q. In what capacity did you return to Monsanto after World War Two in 1946?

A. I returned as the director of the medical department. In other words, Monsanto had a group of manufacturing divisions, there were four or five of those. Then they had staff departments, legal, patent, purchasing, traffic, research and the medical department was formed along with that.

Q. And what were your duties as Monsanto's medical director?

A. Well, they were several fold. It was to arrange for the adequate care of our workers as far as prevention of occupational disease and the treatment of occupational disease by setting up medical installations wherever we had a plant or an office or a research laboratory. It was to obtain information on the

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toxicological products that we made as well as the raw materials that we made these from and it was to inform our customers of any of the possible hazards of our products as well as the safe handling procedures to avoid any injury, or any harm.

Q. You mentioned the word toxicology, could you define that?

A. Well, it's a science that determines a harmfulness or lack of harm of products. Almost all industrial products, in fact almost all products have some toxic characteristics. If you eat enough -- if you take a large enough dose, for example, of water, salt, any of those things can be toxic in exaggerated amounts.

Q. During your early years at Monsanto, did you implement any policies and practices to help promote product safety?

A. Well, yes, I would say the primary one was to try to find out what the toxic properties of our products were, of the materials we worked with and the materials we sold and then we -- I instituted a policy of disseminating that information. We had a policy established that any inquiry concerning safe handling of any of our products with the exception of fire or explosion would be referred to the medical department and inquiry or any communication stated that a company believed the worker had, had been

exposed to our product and had suffered some ill effect was referred to me, no matter where that inquiry came. If it came into a sales office in Detroit or New York or a telephone call or a letter just addressed to the Monsanto Company of St. Louis it was referred to the medical department.

Q. You mentioned that you -- one of your jobs was to look at the toxic properties of all the products Monsanto sold; how did you find out about those toxic properties?

A. Well, first, this is sort of a moving target. If you go back to 1937 there weren't very many articles, journals about -- concerning toxicology. Now in 1980 and 1990 there are quite a number of articles, but back in the early days you would look at what journals there were, you would look at the government reports. There were some government public health service reports would come out on isolated products.

You would look at the standard textbooks, there were one or two textbooks in the English languages that would give descriptions of toxic properties of products. Then if there were no information there you would talk to your confers in the medical field. In other words, I would --

Q. Confers in the medical fields?

A. I mean by that, other medical directors.

Q. Okay.

A. Other medical directors and if for example we made a product, somebody else made it I would call the medical director at Dow and say, "What's your experience with this?" He would call me if they were going to make a product that we had previously manufactured, if this proved to be of ill effect and if there was nothing in the literature, nobody else knew much about a product then we had to do some laboratory work on it.

Q. Would it be your policy while you were medical director at Monsanto to try to review all of the medical and scientific literature on all of the products that Monsanto produced?

A. Well, you have to divide that, scientific encompasses an awful lot of things. I would say I would review whatever medical information was available, what was was available from the standpoint of adverse effects on people.

Q. Did you have any policy with regard to visiting the plants that Monsanto operated throughout the United States?

A. Well, again it varied. Early as I said it was on a sort of fire fighting basis, there was -- I would go down there and because they had a problem or a

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potential problem. Afterwards --

Q. By afterwards what do you mean?

A. By after about 1938 I would go on a yearly basis, more or less on a yearly basis. We had some small plants that I may see just twice, every few years and then following my return in 1946 I went definitely on a yearly basis.

Q. To all the United States plants of Monsanto?

A. Yeah. After we got an assistant medical director we split the visits.

Q. Was there any policy while you were medical director at Monsanto with regard to physical examinations of the workers?

A. Well, the policy varied by plants. For example, at the plant at which I was first employed they did have a policy, they examined all the people on a -- it was a voluntary program but it had been going on I think since World War One, and they examined some departments -- some of the employees in some departments yearly, some every six months and some maybe every two or three years.

Q. Were there periodic physical exams at all of the plants eventually in the United States?

A. Eventually there was, yes.

Q. Can you define the term industrial hygiene?

A. Industrial hygiene is that science that

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endeavors to make a safe environment for the worker. It is an analytical process by which you -- a trained engineer or a trained chemist or industrial hygienist -- now there is a definite education for them, but in the early days there were chemists and there were engineers that would go into a plant and by visual inspection and by his knowledge of the physical properties of a compound he would know whether or not there would be dangers at elevated temperatures or something of that sort. You would also be in a position to carry out analytical procedures. In other words, how much dust was in the air or how much of a particular fume was in the air.

Q. Did you while you were medical director at Monsanto develop a industrial hygiene service?

A. Yes. We hired our first one in 1947, a Mr. Wheeler, and when I left we had four industrial hygienists.

Q. Could you define -- or strike that. Did you hire any toxicologists while you were medical director at Monsanto?

A. Yes. We hired our first one sometime in the fifties. I believe it was the fifties and when I left we had three.

Q. And what is a toxicologist? You defined the term toxicology, but what is a toxicologist?

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A. Toxicology is the man who tries to find out -- who is knowledgeable in the harmful properties of a product. He is knowledgeable in the pharmacology and physiology and biochemistry of different products, each individual product.

Q. Is he a Ph.D.?

A. Yes, usually Ph.D., although there are some master's degrees and some M.D.'s, are also toxicologists, but the majority of toxicologists are Ph.D.'s.

Q. You mentioned that you reviewed the medical literature about Monsanto's products; when did that start, when did you start doing that?

A. I would say within six months after I came with Monsanto, sometime then at the end of 1936.

Q. And how long did you continue that?

A. Till I left. I mean, I didn't do all the reviewing myself, sometime along the way we engaged a librarian who made searches and we had our industrial hygienists and our toxicologists and our part time physicians do some of the reviewing. I didn't do all of it myself but I was apprised of any important material that related to our products.

Q. But from the late 1930's until you retired from Monsanto in 1974 either you or someone in your department would try to review the medical literature with

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regard to Monsanto's products?

A. Yes.

MR. MC CREA: Objection, leading.

Q. (By Mr. Carney) Could you give us some examples of the types of journals, medical or scientific journals you reviewed when you first started the review prior to World War Two?

A. Well, there were two. One was Journal of Industrial Medicine, I believe it was called. Then there's a Journal of Industrial Hygiene and Toxicology. The Journal of Industrial Medicine changed into the Journal of Occupational Medicine. The Journal of Industrial Hygiene and Toxicology fell by the way side sometime.

It went defunct, sometime either during World War Two or shortly afterwards. Of course, there were other occasions, other opportunities for -- I attended meetings, the scientific meetings of the Industrial Medical Association where toxicology was discussed several, in many of the papers.

Q. Why did you review these medical and scientific articles regarding Monsanto's products?

A. Wanted to find out if there was anything knew about it or if it was new to me.

Q. And why did you want to know that?

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A. So it would help me in arriving at providing a safe atmosphere for our workers and for our customers. In order to have safe handling procedures you have to know how the material works and how it is absorbed into the human body.

Q. And these periodic -- and I think you've said annual plant visits that you made to all the plants in the United States that Monsanto operated, what was the purpose of those visits?

A. Well, the purpose was to see for myself what the plant was making. Before we had industrial hygienists and even after we had it I wanted to know, get some idea of the manufacturing process, what the exposure levels may be, exactly what the worker did; because you cannot decide on what his exposure is unless you know what he's -- how, what he does, unless you know for yourself what he does.

It was also to see that the doctor was doing his job, at the plant there were no particular illnesses grouping together. I would discuss any occurrences that might have occurred with the plant doctor, with the nurse, with the plant manager. I would talk to the safety department, safety supervisor.

We had safety departments at all the plants. We didn't have full time doctors until the fifties at some of our plants. At many we never had any full time doctors

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until later in the fifties; but we had a full time safety men. So they were knowledgeable about the plant and I would go through the plant with the safety director.

Q. How long would these plant visits normally take?

A. It would depend, for part of a day. For example, at Norfolk, Virginia where we only had forty people it would take half a day, but larger plants, Springfield, Massachusetts or Boston it could be two or three days.

Q. Did you visit any Monsanto plants in the United States that manufactured PCB's?

A. Yes, I did.

Q. Where were those plants located?

A. One was in Anniston, Alabama and one was at East St. Louis, Illinois.

Q. Did you visit those plants on an annual basis?

A. Yes, I did, at least annually.

Q. Were there other products manufactured at these plants that many made PCB's in Anniston, Alabama and East St. Louis, Illinois?

A. Yes. During the course of years at Anniston they might have manufactured three or four -- they did manufacture three or four others. They manufactured an

insecticide, parathion, they manufactured abrasives, they manufactured some phosphorus compounds. East St. Louis manufactured probably fifty, at least fifty organic compounds.

Q. I won't ask you to list those fifty.

A. I wouldn't be able to.

Q. Did your annual visits to these two plants in Anniston, Alabama and East St. Louis, Illinois, continue up through your retirement, up to your retirement in 1974?

A. Yes. But as I said when we engaged Dr. Saunders he was the first assistant medical director. He was part time, then we engaged Dr. Johnson who was full time. They took some of the visits off, but they always made reports when they came back as to what they found out.

Q. For what period of time did Monsanto manufacture PCB's?

A. They were manufactured shortly before I came and they manufactured them until 1977 to the best -- I know they manufactured them through 1974. They were manufactured by a different company, Swann Chemical Company just at Anniston, Alabama. Monsanto bought Swann sometime before I came. I thought they bought them in 1935.

Q. So PCB's prior to that were manufactured by a

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company called Swann Chemical?

A. That's correct.

Q. And then just sometime shortly before you arrived at Monsanto, Monsanto purchased the Anniston, Alabama plant that made PCB's?

A. That's correct.

Q. What was the policy with regard to physical examinations at these plants in Anniston, Alabama, East St. Louis, Illinois that manufactured PCB's as well as other products?

MR. MC CREA: Objection, unless it's stated as to what year.

Q. (By Mr. Carney) Well, if you could give the years -- What I'd like to know is what the policy was on physical exams at those two plants --

A. We carried out physical --

Q. -- and try to give the years if you can, Doctor.

A. We carried out physical examinations --

MR. MC CREA: We would further object in that any policies with respect to physical examinations would be best described by the written policy itself rather than verbal recollection, rather than recollection by memory.

Q. (By Mr. Carney) Go ahead, Doctor, you can answer the question.

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A. Well, the written policies were not in effect from the general office at that time. There were policies that had been established by the plant management.

Q. Doctor, I don't -- you can just give your best recollection of what those policies were, whether they were written or not.

A. The policies at Anniston were somewhat different than the policies at the East St. Louis plant because Anniston had a situation similar to our present HMO's, which are health maintenance organizations, that is where the physician took care of the workers for non-occupational conditions as well as occupational conditions.

He treated the people in his office for private conditions as well as coming out to the plant on daily visits. He carried out examinations on all the people in the plant, and whether he did that primarily in his office or carried them out at the plant varied but anyway they got examinations on what was close to a yearly basis. The situation in East St. Louis was similar except that the doctor examined them on a regular basis. That basis was not quite yearly, I do not believe, to the best of my recollection, but he carried examinations out at the plants.

Q. And what period of time was there a policy of

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annual physical exams at Anniston?

A. Since before I came with the company until I came back in 1946, and I do not believe it was annual when I came back because I had a policy that depended on the person's age. If a person were thirty it would be every thirty months, two and a half years, if a person were forty it might be every two years, over forty-five it could be every year.

I'm not sure about those exact time frames and that was instituted for all places in the company. Of course, there were special exams that we did for individuals. If they were exposed to asbestos, they were examined at varying levels, at varying time periods, if they were examined and there were other things that they were, if they were --

Q. Was that policy at Anniston, examining at least once a year for the older workers and maybe every couple of years for some of the younger workers, was that carried on until you retired?

A. Yes.

MR. MC CREA: I'm going to interpose an objection as to Dr. Kelly describing a policy of physical examination of workers at the Anniston plant and East St. Louis plant for the reason that that policy would best be described by the doctor who performed the examinations or

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by a written policy which describes the protocol for the examination and the other bases of information which Monsanto used to elicit health problems caused by exposure to toxic chemicals.

Q. (By Mr. Carney) Doctor, did the plant physicians and the plants of Monsanto in the United States, did they report to the medical department and to you as head?

MR. MC CREA: Again, I'm going to object to this line of questioning in that what we're talking about here is something that's verbal. There is no way that did we can cross-examine those people who reported to Dr. Kelly. If he has a document that identifies a report then that would be the best evidence; but what Dr. Kelly says was reported to him by somebody else in the Monsanto organization leaves us with no ability to question some unknown individual.

MR. CARNEY: Well, it's the first time I heard that you had to have a document or you couldn't testify about anything, but we'll go on.

Q. (By Mr. Carney) Doctor, did the plant physicians report to the medical department?

A. Yes, they did.

MR. MC CREA: Again, the objection would be report, verbal, in writing, what years are we talking

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about, what's the protocol? The question is simply -- the question is simply too vague to elicit a response that's meaningful in this situation in which we have workers exposed to PCB chemicals.

Q. (By Mr. Carney) Doctor, did the plant physician report to the medical department during the entire time that you were head of the medical department?

A. Yes.

MR. MC CREA: I still don't know if they reported verbally or if they reported in writing. If they reported in writing then those documents would be available for us to review, so --

Q. (By Mr. Carney) Doctor, how did the plant physicians report to the medical department?

A. They reported in two ways. They had to tell me if there were -- by writing to me or by calling me if there were any cases of occupational injury or occupational illnesses apart from minor skin rashes or skin problems or an acute non-serious inhalation of fuels. If they had any condition that required loss of work, outside medical expense or lost time that had to be reported to the medical department.

And I also went down to each of those plants, I talked to the doctors, I looked at their examination reports. I would use in smaller plants like Anniston I

could go through all of the annual examinations of a man's medical file. At the larger plants I would only take random sampling and look at them.

Q. Doctor, you talked about the physical examinations at the East St. Louis plant that also made PCB's; was the policy with regard to physical exams at that plant, did that continue until you retired?

A. Yes.

MR. MC CREA: Again, I'm going to object, policy, are we talking about a policy in writing, a verbal policy? We simply have no way to respond to this deponent's answer by saying policy. I don't know if it's verbal, I don't know if it's in writing --

MR. CARNEY: Well, I don't know that it matters whether it's verbal or in writing, if it was the policy of the company it was the policy of the company. But if you have other questions, Mr. McCrea, when I finish my questions you'll be free to ask any questions that you want and I would suggest that you if you have other questions you want to ask that you might ask those at that time.

MR. MC CREA: I appreciate that and certainly will have questions to ask, but I object to the form of the question, in that it does not specify as to whether or not we're talking about something that's verbal, which

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would be hearsay or we're talking about something in writing, which could be produced.

Q. (By Mr. Carney) Did you from time to time have occasion to examine Monsanto employees yourself?

A. Yes.

Q. Can you give me some examples of that?

MR. MC CREA: Again I'm going to object to this question unless the examinations which this doctor is now intending to describe are incorporated in writing so that we may review those for proper cross examination. For him to come in here and say that he examined people with no documents of the examination leaves us in the impossible situation of not being able to question him as to the data that was obtained.

Q. (By Mr. Carney) You can go ahead. Do you remember the question?

A. No.

Q. I'll reask it if you want me to.

A. Please.

Q. Can you give me some examples of some physical examinations that you conducted?

A. Yes. When I was a physician at the Queeny plant, that was a Monsanto plant. I was a Monsanto employee, the employees came into the dispensary and I examined at regular intervals for a period 1936 until

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1942. There were written examinations, they are put in the man's medical file and I do not know where those medical files are; but we never threw away any medical files. But I can't tell if you which of the 1200 employees by name, but I examined them on these bases on these intervals that I talked to you about.

Q. (By Mr. Carney) And since your retirement doctor in 1974, do you know what happened to the documents in Monsanto's files if you kept track of them?

A. I don't know anything about them. I took none with me and I don't know anything what happened when I left.

MR. MC CREA: And that's the basis of our objection. We have no way to examine the data which at this point in time would be by memory. It simply leaves us in an impossible situation with respect to health, signs, symptoms, et cetera that these workers may have recorded.

MR. CARNEY: Well, Mr. McCrea, you have had over the last couple of years the opportunity to request any document from Monsanto that you deem important and --

MR. MC CREA: He just said he doesn't know where they are.

MR. CARNEY: Well, this witness isn't employed by Monsanto, he hasn't been employed by Monsanto

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for sixteen years, so he doesn't have the knowledge; but you have had the opportunity and the court rules to ask for documents that you think are important to you in this case from Monsanto and we are obligated if they're proper requests to produce those, and at this point you haven't asked for those documents, so we have not been required to produce any of those documents. But that's up to you as to whether you want to request those documents.

MR. MC CREA: Mr. Carney, that has nothing whatsoever to do with our ability at this point in time to cross-examine this witness as to the data which he obtained in physical examinations which was duly recorded on the records which have not been produced for this examination of this deponent. It's an impossible situation for us. We have no way to cross-examine this doctor as to his observations and conclusions without the data.

MR. CARNEY: Well, again Mr. McCrea, not only have you had the opportunity for several years to ask for any document that you want and you have not asked for these documents, and No. 2 you didn't ask for these documents to be produced at this particular examination, so we --

MR. MC CREA: Well, we're not the ones that are charged with going forward with the examination,

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that's your obligation. You don't have the documents, we can't cross-examine. I'm going to object to any testimony of Dr. Kelly which is not supported by data, with respect to physical examinations. It's like taking a deposition of a doctor, you wouldn't expect a doctor to come to a deposition without his medical records and simply be there to tell you what he recalls. I have never attended a deposition of a medical doctor where you didn't also have the medical records, "Doctor, what does this mean? Doctor what's the significance of this?"

MR. CARNEY: Well, unfortunately, Mr. McCrea, you're mixing apples and oranges. The workers at Monsanto aren't plaintiffs in this lawsuit. We're talking about thousands of workers over the course of the last fifty-five, sixty years and the documents to the extent that they exist would fill up this room and probably this whole building we're in. It would take truck loads.

MR. MC CREA: Were they to exist, you say?

MR. CARNEY: Nobody's asked me for the documents, these examinations and the medical records are scattered throughout the United States, in offices, it would take months and months to try and locate these documents. I don't think they're germane at all, and you have never asked for them. We certainly couldn't produce them in a matter of minutes or weeks or even months.

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MR. MC CREA: Mr. Carney --

MR. CARNEY: So you can make your objection but all I'm saying is you haven't asked for them to date and we don't believe since these workers aren't involved in this lawsuit that it would be at all appropriate to have truckloads of documents brought into this room.

MR. MC CREA: If they're not involved in the lawsuit then I don't understand why you directed inquiry as to them. What's the relevancy?

MR. CARNEY: I'm asking for some preliminary questions about this doctor and what he was doing at Monsanto and I think I'll get to that if you'd allow me to continue my examination. I'll get to the relevancy of it, if I can proceed.

Q. (By Mr. Carney) Doctor, can you tell me what the purpose was of these physical exams, these periodic physical exams of the workers in the plant at Monsanto?

MR. MC CREA: Can we show a continuing objection that I as attorney for the plaintiffs am objecting to Dr. Kelly describing information relative to physical examinations without the data itself available, and that way I don't have to object at every juncture?

MR. CARNEY: Yes, I think so.

MR. MC CREA: Thank you.

A. Before that question, Mr. Carney, you had

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asked me about examples of physical examinations that I did.

Q. (By Mr. Carney) Yes, I'm sorry.

A. And I had mentioned in eight years, six years of examinations that I did at the Queeny plant I did also a group of individuals at the East St. Louis plant who were working in the PCB department, I did that in 1972 and I believe someplace in these files is a report of that, my findings of those examinations.

Q. Okay. We'll get to that document later on.

A. But I wanted to be complete as far as examinations were concerned.

Q. What was the purpose of the periodic plant examinations of the workers of Monsanto?

A. The purpose was to find out if there were any incipient diseases, whether there were diseases of the common lot of man or any conditions that could be attributable to their working conditions, working exposures.

Q. How did it come to be Monsanto's policy -- I think you already testified it was Monsanto policy regarding all inquiry of toxicology or adverse health effects of Monsanto's products to you; how did that policy become a policy of Monsanto?

A. I talked to the executive committee to which

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I reported and said I think we should -- the medical department is the group that possesses the expertise to answer all these questions and I think that is the place where all inquiries should be forwarded and so they said that this is a good idea and so that policy was written and sent out sometime in 1946, and --

Q. How long was that policy in effect?

A. It was in effect until I left in 1974 and to the best of my knowledge, by hearsay, it still exists.

Q. And was that policy followed at Monsanto?

A. Yes.

MR. MC CREA: We would object to the portion of the question which would relate to the hearsay after 1974.

Q. (By Mr. Carney) At least during the time that you were medical director at Monsanto it was the policy that all reports or complaints of possible product related health problems of workers or customers were sent to the medical department?

A. That's correct.

MR. MC CREA: That was not his testimony.

Q. (By Mr. Carney) Is that correct?

A. Would you repeat the question?

MR. MC CREA: I never heard the Doctor state all possible problems. I never heard him say that. That

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was in your question; I have not heard that in testimony.

MR. CARNEY: Let me just ask it again so we have it --

Q. (By Mr. Carney) Was it Monsanto's policy during the entire time you were medical director that all reports or complaints of possible product related health problems with workers or customers were reported to the medical department?

A. Yes, real or possible health problems.

Q. What was the purpose of this policy?

A. To give the person who inquired the most adequate up-to-date information from an authoritative source.

MR. MC CREA: Before we get started -- excuse me, Dr. Kelly -- I'm going to object to any verbal communications to Dr. Kelly from any doctor or people outside of Monsanto. So let's get that understood before we go any further. That is strictly hearsay.

MR. CARNEY: Well --

MR. MC CREA: So if Dr. Kelly wants to state that he talked to someone at Chevron with regard to surveys of workers who used PCB's, consider the objection made at this point in time as that is strictly hearsay from that individual to this person and any one would understand we have no way to question the validity of that

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information communicated verbally by somebody outside of Monsanto to Dr. Kelly.

Q. (By Mr. Carney) Dr. Kelly, I believe you indicated earlier that it was Monsanto's policy that all toxicity and safe handling information must be approved by the medical department before it was distributed?

A. That's correct.

Q. When did that become the policy of Monsanto?

A. It was more or less informal from 1938 to 1942; but it was formalized with the inauguration of the central medical department in 1946, shortly after that.

Q. And how long did that policy remain in effect?

A. My personal knowledge is that it remained as long as I was in -- attached to Monsanto which was until the end of 1974.

Q. What was the purpose of this policy?

A. The policy -- the purpose was to give the consumer the adequate information so that he could protect his workers.

Q. How did Monsanto typically publish toxicity and safe handling information in regard to its products to its customers?

MR. MC CREA: What years please?

MR. CARNEY: I'll cover the years in a

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minute.

A. Well, they used information --

MR. MC CREA: I would object unless the year's specified. I mean, we're covering a span here of 1936 to 1974; there could be a wild variation in how they did things during that time period.

MR. CARNEY: Well, I'd like to do one question at a time. If you have some other questions, that's fine. I'll try to pin down some of these years but first of all I want to ask how it was done and then I'll cover what period of time.

A. It was done either by bulletins, these were application bulletins, sales bulletins, technical bulletins, it was done by including information on the labels that were placed on outgoing shipments of materials.

Q. (By Mr. Carney) Were there documents called material safety data sheets used?

A. Yes. Later on in the sixties or first part of the seventies there were material safety data sheets. Most of the companies in the late sixties started their own safety data sheets, Monsanto was one of those. We had also Department of Labor safety data sheets that were required by the government for certain shipments and these were sent out to our customers along with the products.

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Q. And Doctor, I'm going to show you some technical bulletins and some labels and we'll try to get the dates when I show you those particular documents, I'll cover that in just a little while. Once this safe handling and toxicity information had been approved by the medical department did Monsanto have a policy concerning which customers would receive the information?

A. Well, all customers received the information.

Q. Why did Monsanto want to insure that all the of its customers got the information about the safe handling of its products?

A. I guess we wanted the customers' workers to say safe, to avoid any harm from our products.

Q. Why did Monsanto give this information about safe handling of its products directly to the employees of its customers?

MR. MC CREA: Objected, that's a legal question for this injury to determine as to their obligation to communicate to the employees as a non-delegable duty under St. Louis -- under Missouri law, and we would object to it for the reason that that would be an invasion of the province of the jury as the fact finder.

A. Well, Monsanto did not give this information directly to the employees of the company because one, they

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had no right to. They didn't know who the employees were. They didn't know whether the company was going to add anything to these particular products. They did not know the exposure that the employees would have.

So what we did was send the information to the people in charge of the companies who knew how they were going to use the product, knew what temperatures they were going to use. They knew the employees, how they were going to be exposed; Monsanto knew nothing of that. So we gave the company the information about it, and it was their responsibility to pass it down to the working level.

MR. MC CREA: Now to which I'm going to object for the reason that there's a non-delegable duty on the part of Monsanto to provide toxicological information that's necessary to the worker to protect himself. There are a number of ways that they could have done it and they have already been described, by labels, by material safety data sheets, et cetera.

Now Dr. Kelly has taken it upon himself to be the determiner of the law in this case. That's a question for the court to determine, it's not a question for Dr. Kelly.

MR. CARNEY: I think we need to take a break because the tape is about to run out. I just might say that there is no such non-delegable duty at all in the law, and as a matter of fact it would be improper and

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illegal for a company to go into some other plant that's owned by another company and give them information. That I think is pretty obvious, but we'll save the legal argument I think for --

MR. MC CREA: Kind of hard to explain what you were doing in the Bloomington plant if it were improper and illegal?

MR. CARNEY: Well, you are now mischaracterizing something that I don't think is in the evidence; but why don't we take a break so we can change the tape.

(Whereupon, a short break was taken.)

Q. (By Mr. Carney) Doctor, what happened where a customer of Monsanto would write into Monsanto with a question about its toxicity of a Monsanto product or about the safe handling of a Monsanto product, where would that question go to in Monsanto?

A. It would go to the medical department.

Q. And was that from 1946 at least until you retired?

A. That's correct.

Q. And what would the medical department do with that question about its product?

A. It depended upon the urgency of the matter. I would either call the individual or I would write him.

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If you're talking about the time frame up to 1974 it could be someone else in the medical department. It could be the assistant medical director, sometimes it might be with Mr. Wheeler, dependent on the basis of the individual's question. He might be questioning him about toxicology, he might be questioning him about industrial hygiene, he might be questioning about health aspects or health aspects that correspondence would certainly be seen or answered by the medical physician.

Q. And that was all under your supervision?

A. That's correct.

Q. During the time that you were with Monsanto what was the company policy concerning communication of safe handling information to Monsanto employees who were engaged in the manufacture of Monsanto products?

MR. MC CREA: Again, it would help me a lot if you would state verbal or written, that way I wouldn't have to object, because you can have a verbal policy and a written policy; and I'm going to object to this question for the reason that I don't know if it's verbal, in which case we have no way to establish the details and if written we do have means to examine the document, question the witness.

A. May I have the question again please?

Q. (By Mr. Carney) Yeah. During the time that

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you were with Monsanto, what was the Monsanto policy concerning safe handling of information about Monsanto employees --

MR. MC CREA: Same objection.

Q. (By Mr. Carney) -- who were engaged in the manufacture of Monsanto products?

MR. MC CREA: Same objection. Is it verbal or is it in writing?

A. With the exception of safe handling as far as fire and explosion would be concerned such information would be transmitted by the medical department to the physician, to the safety director, to the dispensary, to the plant manager at the plant. Then each of these groups, the safety director, the plant manager would transmit the information down through the manufacturing people to the workers that it would be transmitted to them, either by billboard announcements or in plant department safety meetings.

Q. (By Mr. Carney) Dr. Kelly, during the time that you were with Monsanto did you keep track of statistics in relation to any diseases with the Monsanto, occurring in Monsanto workers?

MR. MC CREA: Again, I'm going to object unless we have the raw data for the statistical analysis in order to question the conclusions. If he is going to

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talk about data in a conclusionary way then I think that we deserve to see the actual data itself.

Q. (By Mr. Carney) You want me to repeat the question?

A. Please.

Q. Dr. Kelly, during the time you were with Monsanto did you keep track of statistics in relation to diseases of Monsanto workers?

A. Well, when you say diseases do you mean common diseases that --

Q. Well, for example --

A. -- that everyone has, that the man on the street has? I mean, we didn't keep track of how many people had pneumonia or something like that. If you mean by that occupational conditions that's a different situation.

Q. Did you keep track of occupational diseases?

A. Yes, we did; because we had written reports from the insurance company which would detail any occupational conditions for which an outside payment was made, whether there was lost time involved, that was -- those statistics were furnished me quarterly and I would review those.

In addition to that we had our statistics on one particular compound that we carried, that we followed, it

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was not a PCB but it was one individual compound that was not related at all to PCB. That was manufactured at Anniston where we kept statistics of that primarily because of the possibility of malignancy.

We also kept what we called a cancer index. That was started by me sometime in either the late forties or early fifties, in which the insurance group in the central office would relay to me any claim forms that came in on workers listing any type of malignancy. This insurance program at first covered about ninety-five percent of the people because it was partly contributory, but afterwards it was non contributory and covered a hundred percent of the hourly and salary workers.

Q. Was this cancer index that you described limited to any particular plants in the United States?

A. No, took care of all of them.

Q. How often do you review the cancer index?

A. It would vary, probably bi-monthly, certainly at least quarterly.

Q. Did you find in your reviewing of the cancer index any groupings of cancer during the period of time that you worked at Monsanto?

MR. MC CREA: To which plaintiffs will object for the reason that the protocol to the cancer index has not been established, the methodology for obtaining this

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data has not been established. It's not been established that there's been any outside peer review, that this information has ever been given to the United States government. The only thing that we have here is a very ill-defined study done by Monsanto in-house with none of the prerequisites to establishing validity.

MR. CARNEY: Well, again you're asking for documents going back thirty and forty years. I know of no company that keeps documents thirty, forty and even I think we're going back to the 1930's, so we're talking about fifty year old documents. If companies kept all those documents they wouldn't have any room for their employees to work in, because the paper would fill all of their office buildings and plants. But again you have not asked for these documents, we're not obligated to bring them here since you didn't ask for them and you recorded your objection.

MR. MC CREA: Well, that's not my objection. My objection is that you haven't established the protocol, you haven't established the methodology. There has been no indication that this has been peer reviewed. There's been no indication that this has been accepted by anybody outside Monsanto.

So we've got a real pig in the poke here, with respect to who obtained the data, how the data was

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obtained, when the the data was obtained and why the data was obtained. It's simply an impossible situation for plaintiffs to confront, to be able to cross-examine Dr. Kelly with regard to the validity of this stuff.

MR. CARNEY: Again, Mr. McCrea, if you have got questions, if I ask all the questions that you are asking me to ask this deposition would go three times longer, it would go a week or more in length, and I'm hoping we don't go that long. I am trying to ask questions that I think are pertinent. If you have questions you will have an opportunity to ask all those questions after I'm finished.

MR. MC CREA: I understand your questions and I want you to understand my objections.

Q. (By Mr. Carney) Did you -- let me, because I've forgotten the question and I'm sure you probably have after the conversation between the lawyers. Did you find any groupings of cancer during the period of time that you reviewed this cancer index among the PCB workers?

A. Well --

MR. MC CREA: Again I'm going to object. Excuse me, Doctor. There's no showing that this man is an epidemiologist, there is no showing that this man is qualified to establish groupings, that he has any background in this area whatsoever, and he has not been

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qualified in this particular area as an epidemiologist.

Monsanto has done epidemiological reports, I read them, and the appropriate person to answer that question is one who understands the statistical analysis and how to do it. There is simply no information here whatsoever that Dr. Kelly, who is board certified in internal medicine, has the ability to interpret this data from an epidemiological point of view, which based on your question is what I understand you're asking him to describe.

MR. CARNEY: Well, I think we have established that Dr. Kelly is a medical doctor, he's been involved in occupational medicine for forty, actively for forty years and still active on a more limited role. So it goes back over fifty years of experience here. I think he can recognize a cancer when he sees it. He was the one that set up this index. Let me -- Dr. Kelly answered the question and you were talking during his answer, I'd like to just ask the question again. Since you've already objected to it I'll ask the same question if we can just get the answer on the record.

Q. (By Mr. Carney) Dr. Kelly, let me just ask the same question I asked before because I think your answer might have gotten muffled by the objection. Did you find any groupings of cancer during the time that you

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reviewed this cancer index of the PCB workers at Monsanto?

A. No, I did not.

Q. Could you briefly describe, Doctor, the development of the staffing of the medical department at Monsanto during the time that you were the medical director?

A. Well, it started with me and a secretary and then when I found out that we needed an industrial hygienist because I recognized the fact that when I visited the plant I was not in the position to have expertise in ventilation and air analysis so we engaged a industrial hygienist. Then I engaged a professor of preventive medicine at Washington University, a physician as a part time associate medical director.

That was in the late forties. So it grew. As I said, we added more industrial hygienists sometime in the fifties. We engaged a toxicologist. I don't have the exact dates of when we engaged the other ones but as I said we had three toxicologists when I left, we had four industrial hygienists and we had a librarian and we had three part-time physicians as well as a full time associate assistant director.

Q. Did these people in your department work in one particular area of the company or were they spread out?

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A. No. We were in one wing of the building. We had a common, almost a bull pen, a common reception area and so we saw each other very frequently, I mean, ten times a day. Our offices all opened into this central area. We all went to lunch together, we saw each other very frequently.

Q. Did you also have any periodic formal meetings as well as informal?

A. Yes. We had a regular weekly meeting, Monday afternoon I believe it was.

Q. In your role as medical director at Monsanto did you have access to the top management at Monsanto?

A. Yes, I did.

Q. Was the management of -- the top management of Monsanto during the time that you were medical director responsive to you when you made requests or recommendations?

A. Yes, it was. I never asked them a request of any of -- for any authority or any change in manufacturing procedures because of health reasons that they refused.

Q. So any safety recommendation that you had with regard to the safety matters for workers at Monsanto, they were always followed, is that correct?

A. That's right. Of course if I wanted to hire three more industrial hygienists they may object to that.

Q. Did you ask for that?

A. No, I didn't. Just one at a time.

Q. Dr. Kelly, during the 1930's, what were PCB's used for during that early period that you were employed by at Monsanto?

A. Used as a dielectric. A dielectric is an insulating fluid, and they were used in transformers. They were used in in transformers because as I said they did not conduct electricity and they were non-inflammable, relatively non-inflammable. Previously people had used oils, hydrocarbon oils similar to refinery products which were of course inflammable.

Q. And what types of products were these PCB fluids used in as dielectrics?

A. Well, they were used primarily in transformers and especially in places where the location of the transformer was critical. For example at Busch stadium down here, those were filled with PCB's because if the transformer arced and there was a fire you wouldn't be dropping down burning oil on the people in right field. So it was especially -- also at places like the White House where you didn't want that to burn down because of the transformer fluid and in some ways they had to be put in a confined space so where also inflammability was extremely important.

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MR. MC CREA: Could I ask the doctor and also Counsel, could we have dates? There's a big difference between what may have been and --

MR. CARNEY: I think I -- Well, I asked the doctor about the early time when he was at Monsanto, we're talking about the thirties and forties now.

THE WITNESS: Well, Busch stadium was not in the thirties or forties, so that was sometime in the fifties.

MR. MC CREA: That's exactly my point, we simply -- I can't respond unless I have a date. We have such a wide span here.

MR. CARNEY: Well, I'll -- I'm just trying to cover some preliminary matters and all I was asking about was the use of PCB's and if I could go on.

MR. MC CREA: Tom, is it too much to ask to get a date? Is that too much to ask?

MR. CARNEY: No, it isn't, and I think he's just given you the dates, 1930's and forties and then he said the fifties.

MR. MC CREA: Well, when were they in the White House?

THE WITNESS: Sometime in the fifties.

MR. CARNEY: Again, you may have lots of other questions, I know you're going to ask questions. If

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you have questions you'll have your opportunity to ask those. I'm trying to move this deposition along as fast as possible and I may not ask all the questions you might think are relevant.

MR. MC CREA: It would save me a lot of time if you would specify dates.

MR. CARNEY: Well, again, I would like to ask the questions that I would like to ask, and then, you know, you can ask all the questions you want to ask after. I don't think it goes well and I never had a deposition where somebody starts asking questions in the middle of somebody else's deposition.

MR. MC CREA: Really?

MR. CARNEY: I haven't had it happen in twenty-three or four years of practice. I guess it's that many times, but I guess there's always a first.

Q. (By Mr. Carney) Doctor, were there other uses for PC -- Well, let me, with regard to the transformers, were PCB's used in capacitors as well as transformers?

A. Yes; but I do not know the date at which PCB's were used and tried in capacitors.

Q. Were there benefits to using PCB's in transformers and capacitors?

A. Yes.

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Q. What were those?

A. Relatively non-inflammability. They didn't catch fire like the previous fluids did.

Q. Over the years were there other uses developed for PCB's?

A. You don't want me to put dates on these uses?

Q. I don't care, I'm just -- this is general and I'm just asking for other uses?

A. Over the years there were other uses for PCB's, they were used as a plasticizer. That's a fluid that's put into a plastic to make it more flexible. They were used in carbonless carbon paper. There were other uses, they used in, sometimes in paints and I'm sure the application bulletins will show other uses but these are the ones that come to mind primarily.

Q. Back again at the early 19 -- or in the 1930's when you first started working at Monsanto did you review any literature regarding a compound called chlorinated naphthaleneS?

A. Yes. Well, chlorinated naphthalene was a product that was even talked about in medical school because it was the cause of chloracne from the time of the turn of the century. It was a German product that eventually was manufactured around the world that caused chloracne and caused liver trouble and there were numerous

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articles in the medical literature considering chlorinated naphthalene.

Q. Are chlorinated naphthalenes PCB's?

A. No, they are not.

Q. Do they have the same toxicity?

A. No, they're considerably more toxic.

Q. Which is, the PCB's or the chlorinated naphthalene?

A. The chlorinated naphthalene.

MR. MC CREA: There's been absolutely no foundation information for Dr. Kelly to make that statement other than for him to state he's a doctor, he's worked for Monsanto for all these years. He's established no background information with regard to the relative toxicity of chlorinated naphthalene and PCB's and therefore we would object to the answer because there is no basis information, no qualification of him at this point in time to make that statement.

Q. (By Mr. Carney) Were you generally familiar with the literature about chlorinated naphthalenes?

A. Yes.

Q. And was there much literature pre-World War Two about PCB's?

A. There was an occasional publication in which PCB's were included in a survey of benzene derivatives of

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which of course PCB is one. There was a series of articles by Dr. Drinker of Harvard in 1937 to 1939 in which he discussed the relative toxicity of chlorinated naphthalene and chlorinated biphenyl.

Q. We'll get to that article and some others in a minute. In the early literature about PCB's in the 1930's was there confusion about between PCB's and chlorinated naphthalenes.

MR. MC CREA: Objection, leading.

Q. (By Mr. Carney) Can you -- Well, let me rephrase the question, Doctor.

MR. MC CREA: You've already suggested the answer.

Q. (By Mr. Carney) Were there articles in the pre World War Two time frame in the literature discussing chlorinated naphthalenes or PCB's together?

A. Yes. There were both in the pre-war years but mainly during -- in the war years themselves, the war year World War Two, the literature, with the first confusion was in 1937.

Q. And what was that confusion?

A. That confusion was the work of Dr. Drinker in which he testified both what he thought was chlorinated biphenyl as well as chlorinated naphthalenes and he listed as chlorinated biphenyl a compound that was not

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chlorinated biphenyl. He subsequently acknowledged his mistake in a later article.

Q. We'll show you those articles and talk about them in a minute. How is it that you recall studying available literature on PCB's during the early years of your employment with Monsanto?

A. Because historically they had problems at Anniston when it was acquired by Swann and I was interested in it and then also of course correspondence developed between Monsanto and the Bay Plant Corporation, over the support of the investigations of Drinker which occurred sometime in early '37.

Q. What was the problem at Anniston, Alabama prior to Monsanto buying that plant from Swann?

MR. MC CREA: Again I'm going to object unless he has firsthand knowledge of the problem or it comes to us in some documented form rather than just a general answer as to what the problem was. We have no way to know what the source of his information is. I'm more interested in the source of his information.

Q. (By Mr. Carney) You can answer, Doctor. Do you remember -- You mentioned a problem --

A. I really don't. I cannot listen to two people consecutively.

Q. I know it's confusing. I'll restate the

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question. You mentioned in your testimony that there was a problem in Anniston prior to Monsanto buying the plant down in Anniston?

A. That's correct.

Q. What was that?

MR. MC CREA: Same objection.

A. The Anniston plant had a series of chloracne occur in the workers who were working with PCB's. This series of cases was written up in the medical literature by Dr. Jones of Atlanta and that was the basis of my information concerning the episode. In addition I was interested because I was talked to by the supervisors at Anniston who had --

MR. MC CREA: Objection, hearsay.

MR. CARNEY: Could you not interrupt the witness? You can make your objections to my question, but if you wouldn't interrupt the witness, I think that's disconcerting.

MR. MC CREA: It's disconcerting to me that we're getting into hearsay.

MR. CARNEY: Well, you can make the objection after or before the answer, but I'd appreciate not interrupting the witness. I know that's a courtesy that I know you wouldn't do that in a courtroom, and I'd appreciate it if you could avoid that.

MR. MC CREA: I can assure you that if he got into hearsay in the courtroom that we would object at that point in time as being hearsay. Therefore, in that this is going to be used in the courtroom as I understand -- Is that not correct?

MR. CARNEY: I believe so.

MR. MC CREA: I am posing my objection to prevent any further testimony based on hearsay.

MR. CARNEY: Okay.

MR. MC CREA: Unless you can establish to me that this hearsay testimony is admissible.

Q. (By Mr. Carney) Doctor, I'm sorry, you were interrupted. Could you finish your answer?

THE WITNESS: Could you read back where I was, before Mr. McCrea's objection?

(Reporter read back from the record as directed:

"-- in the medical literature by Dr. Jones of Atlanta and that was the basis of my information concerning the episode. In addition I was interested because I was talked to by the supervisors at Anniston who had --)

A. Experience with the workers who were involved in the Swann operation.

Q. (By Mr. Carney) Doctor, you mentioned the word chloracne, what is chloracne?

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MR. MC CREA: Again, there is -- Excuse me, Doctor -- Dr. Kelly stated that he is board certified in internal medicine, that he has practiced occupational medicine; but there is no foundation information that Dr. Kelly has expertise in the area of dermatology, which would be the area in which you would expect an individual to define chloracne, and therefore based on the lack of that foundation information we object to the question.

A. May I answer Mr. McCrea's question or just yours?

Q. (By Mr. Carney) Why don't you just answer my question? I'll cover your experience with chloracne in a minute.

A. Okay, and what was your question again?

Q. Can you define for the jury what chloracne is?

A. Yes, chloracne is a condition somewhat similar to teenage acne. It differs in several respects, at first is the location of the lesions. It is a series of pimples, whiteheads, black heads that occur usually around the ears, around the cheek, upper cheekbones. It may be associated with pigmentation, blackening of the skin.

It is more persistent and more serious than teenage acne at sometimes, it could be sometimes it is extremely

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innocuous, so that the individual doesn't know if he has a few blackheads, a few pinhead, pinhead-sized, a white clogging of his skin follicles around the eyes and he doesn't even know he has chloracne. So it can be mild, it can be quite serious. It is not a local disease per se, by itself; it is a result of systemic absorption of chlorinated compounds, hence the name chloracne.

Q. Is it caused by compounds then other than PCB's?

A. Oh, yes, it's caused by many chlorinated compounds. It's caused by wood preservative, wood preserving chemicals, other ones.

Q. Have you seen chloracne?

A. Yes, between a hundred and two hundred. I'm not exactly sure how many.

Q. And is that the only known adverse health problem associated with PCB's in the industrial setting?

MR. MC CREA: Objection, unless we're going to define known. Are we talking about something that is based upon medical certainty to a ninety-five percent probability based upon an epidemiological survey or are we talking about something that is probable, that is perhaps more likely than not, but yet not certain to be caused by exposure to PCB's?

So without defining the word known we do not have

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the appropriate standard with which to go forward in this case. Obviously the medical community can have a standard that would not be the same as the standard in a court of law. So we would object.

A. May I have the question?

Q. (By Mr. Carney) Is chloracne the only known adverse health problem to industrial exposure to PCB's?

A. There are acute problems associated with exposure to PCB's from the inhalation of the fumes at elevated temperatures. That occasion, that causes -- it causes a chemical hepatitis, which may be accompanied by jaundice and that has occurred at times in individuals who were exposed to PCB's after inhalation of the fumes at elevated temperatures.

MR. MC CREA: Now also I would like to interpose an objection at this point in time for the reason that Counsel has asked Dr. Kelly if that's the only known adverse problem as a result of industrial exposure to PCB's and to use maybe a not-so-accurate analogy, it's like saying you didn't find any Easter eggs, but then you didn't go on an Easter egg hunt, and by that I mean the workerss in the Bloomington, Indiana plant, did not know they were even using PCB's.

Mr. Carney took the deposition of doc -- the plant physician, Dr. Lewallen who learned for the first time

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that PCB's were in the Bloomington, Westinghouse plant when he read about it in a newspapers article. Therefore, to describe what is known in the industry with no foundation information that the workers knew they were exposed to PCB's, had been advised as to the possible PCB problems, were given an appropriate work history and toxicological information about the chemical and furthermore, that the doctors would be able to recognize the symptoms of PCB's simply makes this information from Dr. Kelly meaningless.

Now Dr. Kelly may not have known that, but the fact of the matter is in Bloomington, Indiana, there's not one doctor who has any working knowledge of the toxicological effects of the PCB's. Therefore there's a veritable dearth of information with respect to what is coming up through industry to Dr. Kelly, and unless Counsel can establish that there was a program in which these workers were educated and informed as to the doctors then there is no basis to conclude that they knew what to look for and/or what to report?

MR. CARNEY: Just a minute, Doctor, let me just interject here because obviously what's going on here is that Mr. McCrea here as well as earlier is making speeches. I guess he's trying to make a closing argument to the jury during a deposition, which is totally

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improper.

I think he's experienced enough to know that it's totally improper. I object and move that it be stricken. He has not only made a speech which is in the form of an argument about his case, which -- most of which has no basis in fact. There are all kinds of misstatements in there. I'm not going to go through at this point and point out all of your misstatements, because there's so many of them it would take me a long time and it's a waste of time, because we're in a deposition here where we're asking questions of Dr. Kelly.

You can make some objections, but these speeches where you're making closing arguments -- of course, you wouldn't be allowed to make this kind of a statement if there were a judge here because he wouldn't permit it, he would cut you off immediately.

MR. MC CREA: Tom --

MR. CARNEY: It's totally improper, I ask you to stop it. The deposition will take weeks instead of a day if you continue to make these speeches, but again I'm going to go on and ask the questions and try to find, try to figure out where I am after that speech.

MR. MC CREA: Okay, Tom. Would you extend the courtesy to me of writing, sending me a letter and documenting each and every misstatement so that I can then

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reply back to you as to the belief that what I just stated was one hundred percent correct? Would you extend me that courtesy?

MR. CARNEY: No, because you made so many statements I'd be spending a lot of time trying to correct you on all the misstatements. I think some of them you probably know about, but if you don't know about them, that's not my problem. If you don't have the information I suggest that you try to find the accurate information, like I have, rather than ask me to do your work for you.

MR. MC CREA: No, Tom, you stated that there were misstatements.

MR. CARNEY: Yes.

MR. MC CREA: I would like to know after this deposition concludes by way of letter what you feel was a misstatement and that's a simple courtesy, that's not asking too much.

MR. CARNEY: It is, because you're making these long speeches. If you will give me the courtesy, if you give me the courtesy of just limiting yourself to objections and not make these long winded speeches which are totally improper I'll list the misstatements. I'll tell you what the misstatements are after this deposition's over; but if you're going to continue to make these speeches I'm not going to do that because I'm not

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going to spend my time trying tell you what the facts are. That's your job.

MR. MC CREA: Tom --

MR. CARNEY: That's your job.

MR. MC CREA: Tom, I come from Bloomington, Indiana, I know the situation in Bloomington, Indiana, and you attended the deposition of Dr. Lewallen which you didn't even have recorded. After the deposition, you cancelled the transcription of that, for whatever reason of your own.

MR. CARNEY: That's another misstatement you've made. I'll point that one out now, that's a misstatement.

MR. MC CREA: Do you have a copy of that deposition?

MR. CARNEY: I believe I do. I'll have to check my office. We've taken lots of depositions in this case but what you just said was a misstatement. So now you've been told one misstatement. Can we go on with this deposition? What's happened in another deposition has nothing to do with this deposition.

MR. MC CREA: You don't think it's significant that Dr. Lewallen did not know there were PCB's in the Bloomington Westinghouse plant until he read about it in the newspapers, and he's in charge of health

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and safety?

MR. CARNEY: What the doctor knew or didn't know is in another deposition. Dr. Kelly doesn't know, he never visited the plant, he doesn't know Dr. Lewallen, I don't think. You can ask him if he knows Dr. Lewallen. You can ask him if he knows those facts; but I don't think it serves any purpose for us to debate here what's in another deposition. Do you see any purpose in it?

I just am baffled by your wanting to debate what's in another deposition in this deposition. We can debate these things for hours and hours, but we've got a tape running here. It's expensive, I know -- I don't think any of our clients would want us to sit here and debate something when we're taking a deposition.

MR. MC CREA: Well, I'm just a little taken aback by the phrase there are no known adverse problems as a result of workers being exposed to PCB's when in fact at least those in Bloomington didn't even know there were PCB's in the plant.

MR. CARNEY: Mr. McCrea, you're making misstatements.

MR. MC CREA: They are the parties in this litigation.

MR. CARNEY: And you're making misstatements again about what's in the depositions of your plaintiffs,

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about what's in the depositions of Westinghouse employees that have been taken in other cases, about the Bloomington plant, but again we're not here to debate that.

Can I go on with this deposition? I'd like to continue with it, and if you continue to do this I'm going to ask the court to issue sanctions against you. I hate to do that, but I'm going to do that if you're going to continue to debate me when I am trying to ask questions. If you have an objection, make it.

Q. (By Mr. Carney) Dr. Kelly --

THE WITNESS: Can I ask the counsel for a little courtesy, too? When Mr. McCrea is going into these prolonged objections he's looking just at me, and I have nothing to do with this. I don't believe I am supposed to answer any of his. So would you direct his expressions and posture towards you so I know I am not involved in this particular legal discussion.

MR. MC CREA: Dr. Kelly, I totally agree with that, and that's a good suggestion.

THE WITNESS: Good.

MR. CARNEY: I think hopefully we can minimize our debate.

MR. MC CREA: It's just a little more difficult for me, right angle.

THE WITNESS: I don't mind being on the

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sidelines.

Q. (By Mr. Carney) Dr. Kelly, you mentioned probably about five minutes ago in your last answer that there were some acute problems with exposure to PCB's, and you mentioned one of them being chemical hepatitis, what does acute mean, acute problem?

A. Happening over a short period of time. In other words if you have food poisoning from bad oysters and you're sick to your stomach and have diarrhea, that's an acute episode.

Q. It's not a long lasting?

A. No. If you have an amoebic infestation or something like that which can last over months that's chronic.

Q. When you said if you had exposure to PCB's you can have an acute problem of chemical hepatitis, does that mean if you take away the exposure, the chemical hepatitis would go away.

MR. MC CREA: Objection.

A. If the exposure is big enough, yes, it could go away. If you have a massive exposure that can stay in there a long time you can have very serious results, you can result in a fatality, but that has not occurred.

Q. (By Mr. Carney) When you say massive exposure what do you mean?

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A. Ten to twenty times the allowable concentration for a period of X number of hours, I don't know how many hours, because it hasn't occurred, but large exposures that I don't believe I can define the word large, because I don't know what they were, but I think anybody in manufacturing and medicine knows the difference between large and small exposures.

MR. MC CREA: Tom, excuse me. Again I'm going to object for the record when Dr. Kelly says it hasn't occurred I presume by that testimony he's including all plants which use PCB's. There's been no foundation in this deposition as to which plants had monitoring plants for their workers, what those monitoring systems were, who carried it out and the data provided, it is, to use a phrase, a pig in a poke, therefore without the foundation we can't get to the conclusion.

Q. (By Mr. Carney) Doctor, are there other products that are in common every day usage that can be fatal if they're massive exposure?

A. Oh, yes.

Q. Give me some examples.

A. Detergents, lyes, chlorine compounds for swimming pools, paint, turpentine.

Q. Dr. Kelly, I'd like to hand you some exhibits, Exhibits K-1 through K-5 and ask you if you can

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identify those documents for the record. Can you identify those documents?

A. Yes. You want me to identify them separately and serially. I'll stop at the end of each one.

Q. Why don't you just briefly identify the date and author and title and then we'll ask some specific questions?

A. Okay. K-1 is something published in 1931 probably. It was received for publication December the 15th, so it was published probably six months later by Dr. Smith, Henry Field Smith, who was Assistant Professor of Industrial Hygiene at the University of Pennsylvania, the toxicity of benzenes and certain related compounds.

K-2 is a paper that was written at the meeting of the American Dermatological Society in 1935. Eventually it was published some place, in the Archives of Dermatology and Syphilology. The title is An Acneform Dermatergosis. That's a word that certainly hasn't been used in the last fifty years. It's by Jones and Alden, it refers to a series of chloracne cases.

Q. Is that the Anniston, Alabama acne outbreak?

A. Yes, that is.

Q. The next paper is the Symposium on Certain Chlorinated Hydrocarbons, by Dr. Drinker of Harvard, published in the Journal of Industrial Hygiene and

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Toxicology in September, 1937. It -- the first paper dealt with the possible systemic effects from certain chlorinated hydrocarbons. Then the second paper was the --

Q. The second paper is Exhibit K-4?

A. No. The second in this series was demonstration of the laboratory methods for ventilation, et cetera. The third was a paper in the microscopic lesions, all in this symposium. That's all in K-3.

Okay, K-4, I guess the K-4 really deals with -- I'm sorry, K-4 deals with microscopic lesions of animals that were exposed to various chlorinated hydrocarbons by Dr. Drinker's group at Harvard. That appeared in the February of 1938 issue of the same journal. I can't be sure whether they appeared the same month or not.

Q. That's okay. I don't think that's important.

A. This was a year later, this one, and the last one is this paper.

Q. That's K-1?

A. K-5.

Q. I'm sorry, Exhibit K-5?

A. K-5. Further Observations on the Possible Systemic Effects of Certain of the Chlorinated Hydrocarbons with Suggestions for Permissible Concentrations of the Air in Workrooms, by Dr. Drinker of

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Harvard which appeared in May of 1970 in the Journal of Industrial Hygiene and Toxicology.

MR. MC CREA: Thirty?

A. '39, I'm sorry.

Q. (By Mr. Carney) Doctor I'm going to ask you some specific questions about the article, but let me just ask you some individual ones about the articles K-1 through K-5. Did you personally review those five articles sometime during the period of January 1936 up until you left for the Army in 1942?

A. Yes, I did.

Q. Were these articles published in a way that they could be readily available to other people looking into these matters?

A. Well, anybody interested in the Journal of Industrial Hygiene is certainly used by -- it's present in all the medical school libraries, it's present in the large medical society, large society libraries, it may not be in hospital libraries. It's not a journal that is seen by family physicians, but anybody in the occupational medical field would certainly have read this journal while it was being published.

Q. Let's look at Exhibit K-1.

A. Yes.

Q. K-1 is the Smith article in 1931. What did

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you in your capacity as Monsanto's medical director learn from your review of this article by Professor Smith?

A. Well, it was a description of a toxicological properties from an acute point of view of probably fifteen to twenty or twenty-five various compounds. Of those five compounds one was diphenyl and four were chlorinated diphenyl.

Q. Of the five compounds that Dr. Smith studied, which was the least toxic?

A. Well, four of them fell into the -- about five of them fell into the group that he called four plus, that meant it was somewhat -- acute toxicity was over four grams, four grams per kilogram of body weight. Do you want me to read the --

Q. No, did he -- I think you said didn't you, Doctor, that he examined five different compounds; is that right?

A. No, twenty-five.

Q. Twenty-five different compounds?

A. That's right.

Q. Did he indicate which of the -- Was one of the compounds PCB's?

A. Yes.

Q. Did he indicate which of the compounds was the least toxic of the twenty-five that he studied?

A. Well, they -- three -- two of the PCB's fell into the least toxic group, he had three or four others in there and it was very -- fell into that, what he called was four grams up, but he listed --

Q. Well, let me ask it this way, Doctor: Without having, unless you need to, to read the entire article, did you learn anything about the toxicity of PCB's when you read that article back in 19 -- in the early 1930's?

A. Well, yes. I learned what he found out and also it buttressed my opinion when he stated that two polychlorinated diphenyls, the definite compositions of which were undefined proved non-toxic at doses of four grams per kilogram.

Q. What does non-toxic mean?

A. On the basis of his test they were not harmful.

Q. Okay.

A. And then he had two other derivatives, two other compounds that proved slightly toxic and that's what I learned.

Q. And did this change your opinion about whether PCB's were harmful in the workplace?

A. No, as I said they supported my opinion.

Q. And what is that?

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A. That as far as an industrial compound it was not a particularly toxic compound.

Q. And did Professor Smith in his article suggest any safe handling precautions towards the end of his article? I think he addresses that on page ninety-five.

A. Well, he stated, if I may quote this, "With most of these preparations the toxicity was rather low. There is very little danger of accidental poisoning in industry with any material having a minimum lethal dose of over .25 grams per kilogram or 17.5 grams for a man weighing 270 kilo's." A kilo is two and a half pounds.

But then he goes on to say, he says, "It should be emphasized these toxicities as here reported referred only to the administration of solids and liquids by mouth." So he said that it should be borne in mind that vapor inhalation should also be considered. "These results do not necessarily represent the hazards of industrial exposure to vapors or to skin exposure." But that in 1930 was the common way of testing compounds was by oral administration, taking it by mouth.

Q. Take a look at Exhibit K-2, that's the article by Dr. Jones. What did you learn about -- What did you learn when you reviewed that article back in the early time when you were at Monsanto in the thirties?

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A. Well, it was very interesting because he gave details of the whole problem and operation and what he thought the cause of the material -- of the problem was.

Q. What are you talking about, a problem where, what?

A. What gave these people the chloracne.

Q. For the jury, though, would you tell the jury what problem you're talking about, what plant?

A. The plant had these cases of chloracne.

Q. And where was the plant located?

A. Anniston, Alabama?

A. Was that the plant that was owned by Swann Chemical?

A. That's correct, that was eventually bought by Monsanto. These sixteen cases were sent to Dr. Jones in Atlanta. Dr. Jones treated them all and he gave details of their work history. In one particular case, he gave details of work history. Then he went to to talk about --

Q. How many workers were there that he examined --

A. Sixteen.

Q. -- that had the chloracne at the Anniston plant?

A. Sixteen. I'm sorry. Sorry to interrupt you. Sixteen, evaluate, that's all he reported on, presumably.

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Presumably he did not see anymore, but he may have; but he reported on sixteen.

Q. And did -- out of that sixteen did some of them have very mild chloracne?

A. It would appear so because he treated -- in those days they treated this chloracne by serious cases by X-ray treatment and some they treated by cutting into --

Q. How many, how many did have a very mild chloracne out of the sixteen?

A. One, two, three, four, five, six, seven, eight, nine.

MR. MC CREA: Dr. Kelly, what page are you referring to, is that 1025?

THE WITNESS: 1025.

A. Under special treatment he lists X-ray treatment and incision and training, which means cutting into the hair follicle, which looks like a boil, and had pus in it so he had to drain it.

Q. (By Mr. Carney) Doctor, I think we're running out of tape so why don't we take a brief break and we'll pick up?

(Whereupon, a short break was taken.)

Q. Doctor, did you ever discuss the subject of chloracne with the plant physicians in East St. Louis and Anniston, Alabama that manufactured PCB's?

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A. Yes, repeatedly.

Q. What did you discuss with them?

MR. MC CREA: Objection, hearsay.

A. I discussed the occurrence of chloracne in the previous management at Anniston, I discussed the possibility of any people getting chloracne in our PCB operations and I instructed them to let me know if any PCB workers developed chloracne. This was in Anniston. We were very sensitive to PCB's -- to chloracne, as you can imagine. At East St. Louis we had chloracne from various chlorinated compounds and I asked them specifically about PCB, occasion chloracne.

Q. Did you get any reports from the plant physicians at Anniston or in East St. Louis where PCB's were manufactured by Monsanto about chloracne outbreaks?

MR. MC CREA: Objection, hearsay.

A. I received no positive reports. They were all negative. When I would talk to the people, visited the plants they would tell me they had no chloracne, the PCB workers.

Q. (By Mr. Carney) Getting back to the Exhibit K-2, that's Dr. Jones' article about the chloracne in the Anniston, Alabama plant, after Monsanto bought the Anniston, Alabama plant from Swann Chemical did you see any of those workers that had been the subject of Dr.

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Jones' article?

A. Yes, I did.

Q. And did any of them at the time you saw them have active chloracne?

A. No, they did not even have residual chloracne. In fact, I saw them at the work place and talked to them about it.

Q. Did they indicate any problems with chloracne after that outbreak before Monsanto bought the plant?

A. No, they did not.

Q. Dr. Kelly, have you seen workers --

MR. MC CREA: Just a second. To that last question I'm going to object as hearsay.

Q. (By Mr. Carney) Dr. Kelly, have you seen workers actually involved in the manufacturing of PCB's?

A. Oh, yes, repeatedly.

Q. With regard to the chloracne outbreak at the Anniston plant before Monsanto bought it, are you aware of what the cause was of the chloracne outbreak?

MR. MC CREA: Objection, no foundation.

A. Yes, I am.

Q. (By Mr. Carney) And what was that cause?

MR. MC CREA: Same objection.

A. The cause was two fold, the major cause was they were using an off-spec, off-specification benzene,

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which is the ingredient of the diphenyl. This contained contaminants that when chlorinated caused the PCB to be an off color. It was the color was different, the dielectric constant of the material was different and that was the main reason because when they changed the benzene supplier back to a previous supplier they had no more cases. In addition there was --

Q. No more cases of chloracne?

A. Chloracne. In addition there was rather gross, poor housekeeping in the plant and they straightened that up, cut down the inhalation of fuels and that took care of it. So there was two things that occurred, but the major factor was the off-spec benzene.

Q. And after the Anniston plant no longer used the off-spec benzene and they had better housekeeping did they have any further chloracne problem in the Anniston plant?

A. They did not.

Q. When you say this off-spec benzene, the benzene was a component of PCB's?

A. You take benzene and you run it into a vat, which is a big large closed kettle filled with molten lead and there the benzene turns into diphenyl, which is two benzene rings brought together, which is diphenyl, and if you have contaminants in the benzene well then this

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material then goes and it's chlorinated to make the polychlorinated biphenyl, which is PCB.

If you have contaminants in the benzene, you chlorinate it and you get a chlorinated contaminant which Dr. Jones states in his article that he believed was a chlorinated styrene compound which was he believed the active factor in these cases.

Q. So in his article Dr. Jones indicates that it was this off-spec benzene that caused the chloracne outbreak?

A. It caused -- the chlorination of the contaminants in the off-spec benzene caused a compound which Dr. Jones believed was causing the chloracne.

Q. So just because it gets kind of complicated for layman like myself who are not chemists and doctors for the jury what we're talking about when we talk about benzene is a component of the PCB?

A. Yes, it's a building block.

Q. And that component was off-spec, what do you mean by off-spec?

A. Off specifications. It wasn't pure benzene like they were using before or they went back to after using this one, after using several batches of it.

Q. It was in layman's language poor quality benzene?

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A. Yes, it was in layman's poor quality.

Q. When did you first read this article, Exhibit K-2, which is the Dr. Jones article about the Anniston outbreak of chloracne?

A. Sometime in 1936 after -- I don't know whether it was the first part of '36 or the last part of '36.

Q. Did Dr. Jones in his article which is Exhibit K-2 suggest any safe handling precautions for the use of PCB's?

A. I'm sure he does, but let me look.

Q. I think --

A. He stated --

MR. MC CREA: Can you give us a page, sir?

THE WITNESS: Beg your pardon?

MR. MC CREA: Can you reference the page?

THE WITNESS: Yes. 1030.

A. It was stated in the article that in the beginning an attempt at prevention of the condition was made by being especially careful of all men engaged in the manufacturing of chlorinated diphenyl, which is a PCB, should have a thorough bath after working hours and they should wear freshly laundered clothing before starting work.

Then following the change in the type of benzene

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used and the employment of enclosed distilling apparatus and ventilation fans there was noted a gradual improvement in the acneform. Let's see what else he said.

Q. (By Mr. Carney) Again, I'm just talking about the safe handling procedures. Was there anything else on that subject?

A. Well, unless I go over this --

Q. I don't think I -- I don't recall anything, but feel free to --

A. I didn't think he mentioned anything else.

Q. Okay, I don't -- I note that in the Jones, in Exhibit K-2 they don't reference the Swann Chemical Company by name. Are you certain that this article is about that Swann Anniston chloracne?

A. Oh, I'm certain, yes, indeed.

Q. You mentioned earlier in your testimony that you attended a seminar or a symposium in June of 1937 presented by a Dr. Drinker?

A. Yes, I did.

Q. And that was at Harvard?

A. That's correct.

Q. And I believe there were three exhibits that relate to that symposium, Exhibits K-3, K-4 and K-5, is that correct?

A. That's correct.

Q. Did you read all of those articles at or about the time they were published?

A. Yes, I did.

Q. What type of tests did Dr. Drinker perform, that he reported in his articles?

A. He performed oral feeding --

MR. MC CREA: Dr. Kelly, if you could, if you're making reference to a document, could you give us the --

THE WITNESS: Page?

MR. MC CREA: Yes, the document exhibit number and the page.

A. He carried out inhalation experience -- it was page -- experiments.

Q. (By Mr. Carney) What are inhalation experiments?

A. You breathe the stuff, you put an animal in the cage and put the material in there in a vapor form, you do that by heating up the material outside the cage and blowing it in.

Q. Did he also perform experiments?

A. Yes, I am getting to that. This is page 289, inhalation, then he gets the results of that on page 291.

MR. MC CREA: Which exhibit?

A. 291, the results were 291.

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Q. (By Mr. Carney) K-3, Exhibit K-3?

A. K-3. Then he fed rats, that's on page 293. And then he did some subcutaneous, that means inject the material under the skin, that was on page 298.

Q. Thank you, Doctor. What is the significance of these three articles, Exhibits K-3, K-4 and K-5 that Dr. Drinker authored with regard to PCB's?

A. Well, in the first place he didn't use a PCB. He used what he called a PCB, so as far as the significance, he did not use as he explained later in a subsequent paper he did not use any PCB's.

Q. Which of the exhibits did he explain later that it turned out he didn't use PCB's?

A. K-5.

Q. And what does K-5 indicate with regard to what Dr. Drinker thought he was using in K-3 and K-4, in his earlier tests?

A. Well, this is on page 158 in K-3.

Q. And what did he indicate there?

A. Well, he indicated -- I think I better read it. The six compounds had been listed previously as chlorinated diphenyl -- that is a PCB, chlorinated to 65 percent. It contains 65 percent of chlorine and proved very destructive to the liver. Later experiments with compound 13, which contained 68 percent of chlorine and

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which was also labeled chlorinated diphenyl or PCB was a surprise to us since the second compound was almost non-toxic.

Q. So when he's talking about the second compound, it is in fact a PCB?

A. That's an honest to goodness PCB.

Q. And what did he say about that again?

A. It's a surprise to us the second compound was almost non-toxic.

Q. So he's saying the PCB was non-toxic?

A. Almost, he said.

Q. Okay, I'm sorry.

A. On inquiry it was found that substance 6, that was the one that he done before that he had labeled as a PCB was in reality a mixture of chlorinated diphenyl and chlorinated diphenyl benzene, so that's --

Q. So what he thought in Exhibit K-3 and K-4 was a PCB, he's saying now what?

A. It was not. It was a chlorinated diphenyl benzene, which is a terphenyl.

Q. Is that a PCB?

A. No.

Q. So he's saying what he thought was a PCB?

A. Was not a PCB.

Q. And what you're reading from so the record is

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clear is Exhibit K-5?

A. K-5, and I'm reading Page 158.

Q. Did the first two articles, Exhibits K-3 and K-4, did they address a substance called chlorinated naphthaleneS?

A. Oh, yes, several substances, all called chlorinated naphthalene.

Q. And are those PCB's?

A. No, chlorinated naphthalene is not a PCB.

Q. Did you ever discuss with Dr. Drinker this error where he originally thought he was testing some PCB's in Exhibits K-3 and K-4 and later found out it was not PCB?

MR. MC CREA: Objection, hearsay. We have no way to cross-examine Dr. Drinker.

A. I discussed it with him before he ran his last experiments. In fact, I told him when he explained his results, I said, "This is a surprise to us. First of all I don't know if we've ever sent you any PCB's," and he said, "Well, I got them from Halowax," and I said, "Well, I'll send you some PCB's right off the production line at Anniston."

Q. And did you do that?

A. Oh, yes.

Q. All right.

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A. And so I discussed with him both before and after his experiments and he told me, "Well, I guess we were wrong." We finally got it in print and made it correct.

Q. And the PCB's that you sent him off of the production lines at Monsanto, was that the PCB's that he found almost non-toxic, if you know?

MR. MC CREA: Objection, this witness can testify as to firsthand observation, but this question invites hearsay upon hearsay. There is no indication that Dr. Kelly was there, knew the procedures, followed the protocol. It's just wildly speculative.

A. The material I had sent Dr. Drinker was the material he used in his -- in the experiments that he reported on in his paper of May 1939. I had it sent from Anniston, that was the only PCB he got. Monsanto was the only manufacturer of the material in the United States and Dr. Drinker told me that he used the Monsanto PCB, 1268.

Q. (By Mr. Carney) Dr. Kelly, did Dr. Drinker or anyone else attending the June 1937 symposium at Harvard suggest any safety precautions for workers involved with PCB's?

MR. MC CREA: Objection, hearsay. I assume we're talking about something verbal, not as opposed to something in a written report.

Q. (By Mr. Carney) You want me to restate the question?

A. No. There's a -- Yes, they certainly discussed safety precautions and they also discussed it, remarks were put down in the discussion following the symposium which was published.

Q. So some of the remarks were recorded and are you looking at exhibit -- What exhibit are you now looking at?

A. Well, I'm looking at K-3, page 300 in which he talks, "We're dealing with toxic substances, but we're dealing with toxic substances every day in industry," this is page 300, by Dr. Drinker, "every day in industry, harmful substances, hazardous substances, these can be controlled it is well-known no matter what they are, and we can use them --" oh, this is Sayers, not Dr. Drinker. This is Dr. Sayers from the -- Chief of Industrial Hygiene, United States Public Health Services. So he was the one that discussed safe handling of it.

Q. So was there any consensus of opinion -- Well, let me ask you this, Doctor: Were there occupational specialists who attended the Dr. Drinker's symposium in 1937?

A. Oh, almost everybody in the Northeast, I'll go down -- We'll start with Drinker, of course, who was

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well-known, and the next man was Dr. F. von Oettingen. He was the director of the Haskell Laboratory of Industrial Toxicology. He was also a consultant for Westinghouse Electric, and we have Dr. Sayers who was the Chief, Division of Industrial Hygiene of the National Institute of Health, of the Public Health Service, and Dr. Gray, who was director of the Bureau of Occupational Diseases -- these are all page 30 -- 300 and 301, et cetera. Dr. Gray from Connecticut, Bowditch, Manfred Bowditch, Division of Occupational Hygiene of Massachusetts. One of the manufacturing people from General Electric --

Q. Who was that?

A. A person by the name of Kaimer, assistant to the manager at York Wire Works, General Electric Company.

MR. MC CREA: Doctor, can you give us that page, please?

THE WITNESS: That's page 303. I haven't finished yet.

Q. (By Mr. Carney) I don't know that you need to --

A. We got Dr. Schwartz, the head of Dermatology, United States Public Health Service. Warren Cook, chief of industrial hygienists of Connecticut, everybody from the East, Cory Elkins, Division of Occupational Health,

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Massachusetts, all the government people from the Northeast were there.

Q. Was there any consensus at that symposium among all these experts about safe handling of substances like PCB's?

A. And chlorinated naphthalenes?

Q. Yes.

A. Yes. That they could be used safely in industry as long as safe handling procedures were carried out.

Q. Was there any discussion about what safe handling procedures would be advisable?

A. Yes, use adequate ventilation, do not breathe the fumes at an elevated temperature and avoid repeated or prolonged skin contact.

Q. During the time of your employment with Monsanto were the workers in the PCB manufacturing departments at Anniston and in East St. Louis -- Strike that. Did any of the workers at Anniston, Alabama or East St. Louis where PCB's were manufactured by Monsanto ever demonstrate any ill health effects related to their work with PCB's?

MR. MC CREA: Same objection as stated earlier in condensed form, no established protocol, no records, no data, no ability to cross-examine the witness

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as to the answers.

A. Question again, please?

Q. (By Mr. Carney) Did any of the workers at Anniston, Alabama or East St. Louis, Illinois that were involved with the manufacture of PCB's for Monsanto demonstrate any ill effects related to their work with PCB's?

A. No, they did not.

MR. MC CREA: Further object, excuse me, Doctor, on the basis of hearsay. It's a question that elicits the potential communications from the worker to a doctor. We have no idea as to the protocol used by Monsanto, as to whether it was valid and designed to in fact elicit the signs and symptoms attributable to exposure to PCB's.

Q. (By Mr. Carney) Doctor, I'm not sure I asked you this. You mentioned a Dr. Vosburgh, do you know whether he attended this symposium at Harvard in 1937?

A. He was a medical director of General Electric.

Q. Was there any management from General Electric that were at the seminar to your knowledge?

A. This person Kaimer is one, on page 303, he was assistant to the manager of the York Wire Works, of General Electric. You must remember, Mr. Carney, that

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these problems occurred in wire pulling; in other words, people impregnated the wire, workers impregnated the wire that was used in electric installations.

You're not old enough to remember when you would pull an extension card before vinyl or rubber was used, and you get brown stuff on your hands, and impregnated this fiber or cloth or asbestos with chlorinated naphthalenes and a small amount of chlorinated diphenyl benzene, no PCB's, and that's where these people got their problems. So the York Wire Works of General Electric in York, Pennsylvania was where they had the problems.

MR. MC CREA: Excuse me, Doctor. That I assume, what you just stated is in the report, is that correct?

THE WITNESS: I can't hear you.

MR. MC CREA: What you stated is in the report?

MR. CARNEY: Just a minute. Again, don't answer that at this time. I'm going to ask the questions during my exam. If you want to ask questions you're going to have to wait until I finish. We'll have to have some order on that.

MR. MC CREA: I agree, but I'm objecting to the answer as being hearsay unless it is written in the report. I don't know; so my objection stands as hearsay

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at this point. It very well could be in the report.

THE WITNESS: You're supposed to look at him, not me.

MR. MC CREA: It's hard to do.

Q. (By Mr. Carney) Did chloracne or any other type of -- Strike that. Did chloracne occur in any of the PCB workers at Anniston, Alabama or at East St. Louis, Illinois during the time of your employment at Monsanto?

MR. MC CREA: Improper foundation, calls for hearsay. There is no data, no study, no protocol, no indication that the workers were even advised that they are working with PCB's. Simply an impossible situation for plaintiffs to confront by way of cross-examination.

MR. CARNEY: Well, I disagree with that. I think he's testified he visited the plants on an annual basis, he talked to the plant physicians and told them to instruct him as the head of the medical department at Monsanto if there was any chloracne in any of the PCB workers. They were very sensitive to chloracne because of the prior outbreak at Anniston before Monsanto bought the Anniston, Alabama plant. So I think he's qualified and there has been a foundation laid for him to answer that question.

MR. MC CREA: Tom, my objection is he may be qualified, the people at the plant may not be qualified.

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We don't know their qualifications. We don't know what they understood to be chloracne. We don't know the protocol. It's hearsay upon hearsay. This man is far removed from the workers in the plant at Anniston and in the plant at East St. Louis or Sauget, Illinois and there just is not proper foundation information for him to answer.

He may answer as to what he saw. He may answer as to what he observed. Beyond that we're into a very -- into an area of hearsay and speculation. Impossible, impossible for us to cross-examine this witness.

Q. (By Mr. Carney) Let me just repeat the question, because I -- it's sometimes difficult to be heard. Did chloracne occur in any of the PCB workers in Anniston, Alabama or East St. Louis, Illinois during the time of your employment at Monsanto?

MR. MC CREA: Same objection.

A. It did not.

Q. (By Mr. Carney) Was any type of health study ever performed on any of the Monsanto PCB workers above and beyond the periodic physical exams and also your -- above and beyond your periodic plant inspections?

MR. MC CREA: Are we talking about from 1936 to 1974?

MR. CARNEY: Yes.

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A. Yes. It all depends on what you mean again by health study. I carried out an examination of all the workers in the PCB department at the East St. Louis, Illinois plant. I did that myself, I carried out a medical history --

Q. (By Mr. Carney) Approximately when was that?

A. I think 1972 I believe. I carried out a medical history and occupational history, work experience history. I did a physical examination on them. I carried out all the battery of clinical tests that were available at that time, and I carried out blood analysis of PCB in these 27, 28 workers.

Q. And these were the PCB workers in East St. Louis?

A. Who were working in that plant at that time, yes.

Q. And when you say you conducted a battery of clinical tests, what was involved in that?

A. That's the one if you go to a doctor he takes a blood sample and sends it to a laboratory; now he runs twenty-one different tests. In those days it was twelve. He'd run all the the calcium, sodiums, liver enzymes, alcohol, esterols, triglycerides, thyroid functions, then he would run complete blood counts. That's what I ran.

Q. Did you run things like EKG's and X-rays and

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things like that?

A. Yes, we did.

Q. When you say you took a medical history, what do you mean by that?

A. Well, we asked them what their medical illnesses were in the past, whether they had any particular medical complaints now, when was the last time they saw the doctor, whether they are under any medication, whether they were hospitalized at any time in the recent or not so recent past, whether they had gained weight, whether they had symptoms, whether they'd puffed when they went upstairs, whether they had pains in their joints, the whole battery of things you ask when you get a complete examination by a trained physician.

Q. What level of PCB's did these employees have in their blood?

MR. MC CREA: Objection. Now we have a PCB blood test, the laboratory which did the analysis has not been identified, the protocol for the analysis has not been described, it's simply -- Again, there's simply no way to cross-examine this witness as to the validity of the results and I have never seen a written study, Tom, never seen a written study of this. Do you have one that you can give us?

MR. CARNEY: We have some writing, I'm

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getting to it in a minute, I'm just about to get to that. Are you finished with your objection?

MR. MC CREA: Finished.

Q. (By Mr. Carney) Do you remember the question?

A. No, I certainly don't.

Q. (By Mr. Carney) Oh, I think I asked you about the -- what the PCB blood levels were, what the level of PCB's was in these employees blood that you examined?

A. Yes.

MR. MC CREA: Same objection.

A. Some were zero, some were -- they varied from zero to a maximum of .5 parts per million. Remember now this was in 1972 and the methods were not as accurate or as they would be in 1980's and today.

Q. (By Mr. Carney) What is the significance of those blood levels, zero to a high of .5 parts per million.

MR. MC CREA: Again, there is no foundation information that Dr. Kelly has developed any expertise as to the significance in levels and he has just stated in fact that they measured this to parts per million when I think everyone would recognize that accuracy is obtained by measuring to parts per billion, so we on the basis that

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the test results are not accurate as he has stated, on the basis that there is no showing that he has an ability to know what levels produced toxic effects, i.e., by comparing to Yusho or Yucheng, Bloomington, Indiana, other areas, we would object.

MR. CARNEY: Well, let me just state for the record: The doctor didn't say they were inaccurate, there were as accurate as you could get them at the time. Obviously in 1972 you can't get them as accurate as you might in 1990; but he didn't say they were inaccurate, they just were -- that was the best they could do at that time.

MR. MC CREA: I believe you're correct, he stated not as accurate as they are today.

Q. (By Mr. Carney) What is the significance of these blood levels of PCB's that range from zero to a high of .5 parts per million?

A. Frankly not a great deal.

Q. Why is that?

A. Because at that time we were not sure whether we had a reference background in the people who were not industrially exposed. We did not have levels of people who had chloracne. Here we had a group of individuals who were suffering illnesses and I would say that the only significance was that here are people who have .1, .2

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parts per million of PCB by the 1972 analysis that the that had no evidence of any clinically -- of any clinical illness.

MR. MC CREA: Again, I have to interpose the objection. It is hearsay, no reports, we don't know if Dr. Kelly did the clinical evaluations, if somebody else did it, the reliability is just impossible to determine.

Q. (By Mr. Carney) Did you find any chloracne in these 28 or so PCB workers from East St. Louis, Illinois?

MR. MC CREA: Same objection as to the fact that this is -- that Dr. Kelly, while an internal medicine doctor, is not a dermatologist.

A. I did not find any chloracne in any of these individuals.

Q. (By Mr. Carney) Were there any abnormal findings that you found as a result of these exams that you made of these PCB workers in 1972?

MR. MC CREA: Same continuing objection, hearsay, impossible to cross-examine as to reliability and validity.

A. There were no findings that could be associated with PCB exposure. There were the usual cases of conditions of high cholesterol, obesity occasionally, that you would find in the run of the mill 27 people

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walking down Broadway when you bring them in that age group and examine them.

Q. (By Mr. Carney) By Broadway you mean not New York Broadway?

A. Yes.

Q. Because there are a lot of abnormal, unusual people in Broadway, New York.

MR. MC CREA: Now further object, excuse me, Doctor, further object that Dr. Kelly has now voluntarily made himself an epidemiologist as if he knows what the standards are for the general population. There's been no showing that Dr. Kelly knows what the standards are, what the numbers are with respect to the general population. That question is absolutely necessary, as foundation information in order for him to say that this group of workers at Monsanto is the same as the number of people walking down Broadway. We don't know what those numbers are.

Q. (By Mr. Carney) Doctor, did you provide the results of these physical examinations and laboratory work to anyone?

A. Yes, I provided it to the plant physician in East St. Louis, I provided it to the individuals themselves during the individual examination and I provided it to some gentleman in the army, I'm sorry, in

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the United States government.

Q. Let me hand you, Doctor, what we have marked as Exhibit K-6 and ask you if you can identify that, Doctor?

A. Yes, I can.

Q. Would you please?

A. Yes, this is a letter of mine dated May the 10th, 1972 to Dr. J. Clarence Davies the Third, senior staff member, the Council for Environmental Quality, Washington, D.C. He is associated someplace with the government. I do not know which one of the branches the Council of Environmental Quality falls under.

Q. Was this the letter you referred to in your testimony that you sent to the government official reporting on your examinations of these PCB workers back in 1972?

A. That is correct.

Q. And you sent that letter sometime on or about May 10, 1972?

A. That's correct.

Q. Were there any subsequent health problems found in these East St. Louis workers?

MR. MC CREA: Objection. We are really going from what is required by way of clinical evaluation, what was done in a protocol to a conclusion without any

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foundation information.

Q. (By Mr. Carney) Let me rephrase the question, or ask a different question really. Taking a look at Exhibit 6, K-6, your letter to the government back on May of 1972, could you read the last sentence of that letter?

MR. MC CREA: Same objection.

A. "In summary I can say that these workers were as healthy as any cross-section of our plant workers of the same age."

Q. (By Mr. Carney) And again the workers you're talking about in that paragraph were which workers?

A. The 27 individuals that I examined who were engaged in the manufacturing of PCB in our East St. Louis plant.

Q. Did the government cooperate? I mean, I'm sorry, did Monsanto cooperate fully with the government with regard to the inquiries they had about the East St. Louis plant and the PCB workers in that plant?

MR. MC CREA: Objection. There's been no identification of any inquiries, that is a conclusion without any data.

Q. (By Mr. Carney) Well, let me ask the question. Did the government make any inquiries about these examinations that you made of the PCB workers in

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East St. Louis in 1972?

A. Yes, they did. They made inquiries about what we knew about the health aspects of these people. At one time they were interested in coming down to the plant to go through the plant. Subsequently somebody from the government went down and I'm sure some of these exhibits that they had gone through the the plant and at that time they were thinking of making an epidemiological survey but they found that the numbers were too small.

Q. Did Monsanto cooperate fully with the government in this investigation?

MR. MC CREA: Again, please, Tom, we don't know who the government people are, what the investigation is, why the investigation was being made, there is no documents, no data, no information. He's asked to state did they fully cooperate; I would imagine that his answer was yes, they fully cooperated. But we don't have the names of the people from the government who were making the investigation. There's just no record of this.

MR. CARNEY: I have provided you the exhibit that we have been talking about it, you have been able to look at it as well as me, it's Exhibit K-6, it's a letter with a copy of the test results attached. It's dated May 10, 1972, there's the name of the government official, Dr. Clarence Davies the Third, senior staff member, Council

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for Environmental Quality in Washington, D.C.

MR. MC CREA: What I would be interested in is his letter to Monsanto explaining the purpose of the inquiry so that we would have a frame of reference to which we could then address his response.

MR. CARNEY: Again, Mr. McCrea, this examination is a lengthy one. If there are other questions that you want to ask you will be free to ask those questions. I'd like to go on with mine and if you have questions you can ask them.

MR. MC CREA: I have lots of questions. I'm objecting to this evidence.

MR. CARNEY: Well, just make your objection. Don't suggest questions or ask questions. Those I'd save for your examination.

MR. MC CREA: Objection, no foundation, hearsay, no data, no letter, no reference, no nothing.

Q. (By Mr. Carney) Doctor, I'll restate the question --

MR. CARNEY: And you can just say same objection so that we can get on with it.

Q. (By Mr. Carney) Doctor, did Monsanto cooperate fully with the government in their inquiry about the PCB workers in East St. Louis in 1972?

MR. MC CREA: Same objection. What inquiry?

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A. To the best of my knowledge, yes.

Q. (By Mr. Carney) During -- Oh, one thing I forgot to ask you. The plant physician that Monsanto had when you joined Monsanto in the Anniston plant where PCB's were manufactured, was he the same plant physician that was down in Anniston during the outbreak when Swann Chemical opened the Anniston plant?

A. Yes. That was Dr. Martin and he had been there for a period of five to ten years before Monsanto took it over.

Q. Was he involved at all in the Anniston outbreak of chloracne?

A. Oh, yes. He was the one that diagnosed them. He was the one that sent them to Jones.

Q. During all the years that you worked for Monsanto --

MR. MC CREA: Excuse me. Again, I think that's interesting, but it's hearsay.

Q. (By Mr. Carney) During all the years that you worked for Monsanto were you aware of any PCB-related health problem in the Monsanto PCB workers?

MR. MC CREA: Same objection, hearsay, no foundation.

A. I was not.

Q. (By Mr. Carney) What about -- that chloracne

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come to my attention.

Q. Doctor, during your thirty-eight years of employment with Monsanto, did the medical department receive any customer or user complaints of chloracne or other claim of health effects in relation to PCB's?

MR. MC CREA: Same objection, hearsay and for the further reason that there is no showing that these workers in industry even knew they were working with PCB's.

MR. CARNEY: Well, I think that's contrary to the testimony of your clients who indicate throughout their depositions that they knew they were working with PCB's and they described their working with PCB's in detail in hundreds of pages of testimony.

MR. MC CREA: Tom, you are badly mistaken.

MR. CARNEY: Well, again, let's not debate that. The facts will be --

MR. MC CREA: The fact of the matter was they knew it as Inerteen. They did not know it as PCB and there's not one person you can name that knew he was working with PCB. That's in this litigation. Until this issue surfaced in Bloomington shortly before it was banned by Congress. If you can name them, name them. It's just not accurate.

MR. CARNEY: I don't think it serves any

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outbreak was before?

A. That was Swann employees.

Q. To your knowledge has Monsanto ever had a personal injury or a workmen's compensation claim filed against it in relation to PCB's by any employees of Monsanto?

MR. MC CREA: Same objection. Hearsay, no data, no information, no showing that he has access to the information, no showing that the workers even knew they were working with PCB's. That's not even been established.

A. Question again?

Q. (By Mr. Carney) Okay. To your knowledge has Monsanto ever had a personal injury or workmen's compensation claim by any of its PCB workers against it in relation to the PCB's?

A. They have not.

Q. Is that the type of information that would come to your attention as head of the medical department at Monsanto?

A. As I explained -- the answer is yes. As I explained I received quarterly reports from the insurance company that developed all the data on compensation claims, compensation payments, whether there were payments to the employer or payments to the doctors, that would

purpose for us to debate what's in the depositions. Again, I prefer not to debate it here because I think we're just wasting the time of the court reporter and Dr. Kelly.

Q. (By Mr. Carney) During the thirty-eight years that you were employed by Monsanto did you receive any complaints about any health effects of PCB's from anyone connected with the transformer or capacitor industry?

MR. MC CREA: Hearsay.

A. I did not.

Q. (By Mr. Carney) And if any of those customers of the Monsanto and transformer and capacitor industry made a complaint about health effects of PCB's on one of their workers would that come to the direction of the medical department?

A. Yes, it would.

Q. During the period again of your employment at Monsanto did the medical department receive any customer or user complaints of chloracne or any other health effect in relation to PCB's?

MR. MC CREA: Objection, hearsay.

A. You have to divide that question into two parts. One, I did not receive any complaints about chloracne. I did receive complaints on two occasions --

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oh, yes, I did receive one complaint about chloracne from an organization that was a thermometer company in New York. This was of interest to me because it was our first one that we have ever had, in fact the only one of chloracne, so I went up to this plant.

Q. (By Mr. Carney) When was that approximately, in the fifties or sixties?

A. Probably early fifties. This was an organization that made thermometers. They made oven thermometers, they had bellows on this thermometer which was a sort of a sack, an impervious sack that had the liquid PCB and the girls would drop their hands in there to fill it up and three or four of them had chloracne, and I said, "Why don't you get some sort of a gimmick that you don't put your hands into the solution," and they did and the chloracne left. They had no -- there was no residual. So that was the only complaint of chloracne that we had from this thermometer company, no transformer, no capacity.

Q. But you had one complaint of chloracne in thirty-eight years?

A. Yes.

MR. MC CREA: Same objection; one complaint in thirty-eight years, with no foundation. I don't know how much longer we need to pursue this. Why don't you ask

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him what information he supplied to these people so that they could determine there was chloracne?

MR. CARNEY: Well, we'll get to what information Monsanto supplied to the customers a little later. I can't cover everything at one time. I can only ask one question at a time.

MR. MC CREA: Well, you've got your cart in front of the horse.

Q. (By Mr. Carney) Go ahead.

A. Now the second part of that question was were there any complaints. I don't want to use the words complaints, reports about possible health effects, on two occasions --

Q. Regarding PCB's?

A. PCB's, on two occasions --

MR. MC CREA: Same objection, correct.

MR. CARNEY: Okay.

A. On two occasions there were this discussion between me and a doctor for one of the -- who had examined one of the companies that had used PCB's in a heat transfer agent as a heat transfer system. It was a temporary one and had quite a number of leaks in it and he had these people that worked there in spite of the leaks and they had a chemical hepatitis which was prominent and the jaundice developed. Obviously they removed a few

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people as soon as they saw this jaundice and then they afterwards subsequently these people recovered.

Q. By removed the people what do you mean?

A. Got them out of the work place.

Q. Got them out of the exposure to PCB's?

A. Exposure, till they fixed the matter up, till they fixed the leaks of this jury rigged temporary heat transfer outfit. The other was the Crown Chemical Company in New York, I guess that was in the sixties, I'm not sure. They had several people who were in the same sort of a heat transfer arrangement. I don't know whether it was a permanent or temporary one, but they complained about nausea and gastric, stomach problems and I suggested to the plant management that this very likely could have been beginning with chemical hepatitis and you should watch out for jaundice. They called me a week or so later, and said, "Yeah, you were right, we've got jaundice," and I said, "Keep them away from any exposure and have their doctor treat them with the usual thing you do for a liver problem and let me know how they got along," and I checked them and a month later and they were fine, they got well. Those are the cases I had.

MR. MC CREA: Same continuing objection, correct, hearsay.

Q. (By Mr. Carney) So during the thirty-eight

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years of your employment at Monsanto you're aware of those three complaints regarding adverse effects of PCB's in customers, workers?

A. That's correct. I know those three definitely. It seemed to me I could have forgotten one or two; but I know they weren't any more than I could count on the fingers of one hand.

Q. All of these complaints, I think you used the word --

A. Reports.

Q. -- reports, you said there were no residual, what do you mean by residual?

A. That means they got well.

MR. MC CREA: Same objection. He couldn't know what happened unless somebody reported, that's hearsay.

Q. (By Mr. Carney) Did the people report there were no residual problems?

MR. MC CREA: Just a second, Doctor, I think I have to object every time otherwise I waive my objection. same objection, hearsay, no testimony that he saw any of these individuals or treated them or has any records.

A. Please repeat the question.

Q. (By Mr. Carney) Was it reported back to you

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that these people that had these three reports of adverse health problems with PCB's, was it reported back to you whether they recovered or not?

A. Yes, it was that they had recovered.

Q. Had you ever received any reports or complaints from customers involving any fatalities or claims of serious long term health effects from PCB's by the workers of those customers?

MR. MC CREA: Same objection, hearsay.

A. I have not.

Q. (By Mr. Carney) Did you ever receive any complaints from Westinghouse that any of its workers had any health problems associated with PCB's by its workers?

MR. MC CREA: Same objection, hearsay.

A. I have not.

MR. CARNEY: I got the report that we're about to run out of tape so we'll take a brief pause to change tapes.

(Whereupon, a short break was taken.)

Q. (By Mr. Carney) Doctor, earlier in your testimony you indicated you reviewed the literature particularly about products that Monsanto made, how long did that practice continue?

A. Well, I wouldn't have limited to just to the products being made, I reviewed any -- certainly I

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reviewed the literature that referred to any of our raw materials and as a person interested in occupational medicine if there are any significant articles about any chemicals I reviewed them and that lasted as long as I was associated with Monsanto in 1974 and I continued to do so although not having a librarian I may not do it as extensively as I did in 1974.

Q. Are you aware of any reported cases of ill effects from PCB's in the medical and scientific literature other than the -- we talked about the Dr. Jones report of the Anniston chloracne outbreak?

A. Will you repeat that? I want to be precise on this.

Q. Are you aware of any reported cases of ill effects from PCB's in the medical or scientific literature?

A. You mean in workers or on people or on animals.

Q. In workers?

A. In workers there have been cases of chloracne reported.

Q. How many times has that been recorded in the literature?

A. Two or three I believe, depending on -- Some of it is in England, in the English literature, probably

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two or three.

Q. Dr. Kelly, at the time of your retirement from Monsanto in December of 1974 what was your opinion as to a reasonable degree of medical certainty concerning the toxicity of PCB's in relation to human health?

MR. MC CREA: Again, there's been no foundation information upon which Dr. Kelly can predicate this opinion. We have entirely skipped over the poisoning in Yusho which was in 1968 and everyone knows involved PCB's and furons, so -- and there has been no data presented. Dr. Kelly, who's a medical doctor in internal medicine, a specialist, has not given us one page of data based upon an examination of a person with industrial exposure or environmental exposure to polychlorinated biphenyls.

So what we have is opinion based upon information from sources unknown, in places unknown and protocols unknown and some articles. It's simply not -- There is simply not a proper foundation for Dr. Kelly to come to this conclusion, particularly in light of the overwhelming amount of evidence that came to industry --

MR. CARNEY: Again, Mr. McCrea, you're giving a speech here, if you just make your objection, these speeches are unnecessary and all it does is prolong the deposition. That's not an objection you're making, it's a

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speech and is your opinion and it isn't shared by me.

MR. MC CREA: Well, that doesn't surprise me but I am directing these comments to the court and would simply ask the court to --

THE WITNESS: You're supposed to look at him during these soliloquies.

MR. MC CREA: You have the dignity of a judge, Dr. Kelly. I'm addressing this argument to the court in objection to your question and I am trying to place as much foundation information in the objection as we can in order to preserve error, thank you.

MR. CARNEY: I'll give you before I ask the question, so I'm going to repeat the question and I'll give the same objection so you don't have to go through it.

MR. MC CREA: Thank you.

Q. (By Mr. Carney) Dr. Kelly, at the time of your retirement from Monsanto in September of 1977 what was your opinion to a reasonable degree of medical certainty concerning the toxicity of PCB's in relation to human health?

MR. MC CREA: I believe you said '77 and I believe it's '74.

Q. (By Mr. Carney) I'm sorry, if I said '77 I believe it's '74, your retirement in '74.

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A. I'll ask you to repeat it please.

Q. (By Mr. Carney) I think I misspoke, apparently. Dr. Kelly, at the time of your retirement from Monsanto at the end of 1974 what was your opinion to a reasonable degree of medical certainty concerning the toxicity of PCB's in relation to human health?

A. Well, you have to break down human health. My opinion was as far as industrial workers are concerned with the exception of chloracne, and with the exception of acute episodes there has been no problem with industrial workers. Also, however, if the material is taken by mouth, if it has --

Q. You mean if you eat it?

A. If you eat the material, especially after it's been cooked as in Chinese and Japanese episodes which caused the formation of dibenzofurans which are entirely different condition, then it is quite toxic. So from the standpoint of an industrial chemical I think it carries a certain amount of toxicity. I would say it's a mildly toxic compound, and it's been used industrially for a billion -- over thirty or forty years, a billion and a half pounds of the material, at least, with no reported ill effects in the workers with the exception of acute episodes of chemical hepatitis and chloracne.

Q. What do you mean by acute episodes?

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A. Something that happens in a short time. As I said earlier today, if you get a bad oyster and you get sick to your stomach and have diarrhea that's an acute episode.

Q. And it goes away when you quit eating the bad oyster?

A. When you get over it, yes.

Q. What is that opinion about the toxicity of PCB's in relation to human health based on?

A. It's based on, A, my thirty-eight years in occupational medicine, my review of the literature during all those years, my experience at talking with other medical directors who had PCB operations by talking to the government people, by reading some of the government articles where they describe a lack of ill effects in workers.

Some of the most prominent workers in this field of occupational medicine, one of them is Dr. Renate Kimbrough, who has been working with -- she works for either the EPA or NIOSH, National Institute of Occupational Safety and Health which are the two large government bodies associated with PCB's, with all industrial health, and she has stated twice in the last four years, written publications that there have been no -- with the exception of chloracne that there have been

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no chronic demonstrable health effects with PCB, due to PCB's in the industry. Also, my talks with the Department of Agriculture, talks with the Food and Drug Administration, where they have set certain levels for PCB in food stuffs. All that's of course my opinion.

Q. Doctor, do you have an opinion to a reasonable degree of medical certainty that PCB's are safe in the work place if you avoid repeated continuous skin contact and do not inhale fumes at elevated temperatures or in a confined space?

A. Yes, they are --

MR. MC CREA: Objection in that repeated skin contact is not defined. Do we mean -- What do we mean by that? Also I'd object unless we define by fume content the level of ambient PCB's which would be inhaled by the worker. In other words, the question has no limits, what do we mean, prolonged skin contact, based in milligrams, what do we mean --

THE WITNESS: Are you asking me or are you asking him?

MR. MC CREA: No, I'm objecting.

MR. CARNEY: No, he's -- Again, I think you made your objection. If you want to ask any questions since I'm not under oath my recommendation is just to wait until you get a chance and then ask any questions of Dr.

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Kelly.

MR. MC CREA: Objection in that skin contact is not even close to being defined as to the amount, milligrams on the skin, et cetera, and we have no, absolutely no parameter on the amount of PCB's in the air, both of which are critical factors.

MR. CARNEY: I'm going to reask the question, because I think Dr. Kelly answered it, but I think his answer may have gotten somewhat garbled because you started objecting. I'm not criticizing you for the objection but I'm just saying I'll give you the same objection so we can get a question and an answer clearly on the record.

Q. (By Mr. Carney) Doctor, do you have an opinion to a reasonable degree of medical certainty that PCB's can be handled safely if you avoid repeated or continuous skin contact and do not inhale fumes at elevated temperatures in confined spaces?

A. Yes, I do.

Q. What is that?

A. The answer is harmful effects -- the material can be used safely.

Q. Why is it advisable to avoid breathing PCB's at elevated temperatures?

A. Because you get more of the PCB's into your

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body. In other words, if you have PCB's sitting in a bucket on the floor, the volitility, which means the amount of PCB's that comes off at room temperature is quite small, you can smell an odor if the amount is quite small. If you heat the material depending on how hot you get it you get an increase in the amount that goes into the air, depending on which PCB it is.

Q. And so if you have PCB's sitting in this room that were just at room temperature would that be harmful?

A. No, it would not.

Q. Was that your opinion throughout your course of employment at Monsanto with regard to the harmfulness of PCB's at elevated temperatures and not at room temperature?

A. Well, yes, but it didn't start the first day. As soon as I learned about PCB's and as soon as I read about it and as soon as I talked about it with the people that worked with the material and the foreman and manufacturing people who made it then it was my opinion and I -- any further information that was developed buttressed that opinion and I kept it the rest of my time through Monsanto and I do today.

Q. Was it your opinion throughout your course of employment at Monsanto that PCB's could be handled safely without ill effects if Monsanto's basic safe handling

precautions were followed?

A. Yes.

MR. MC CREA: Again, objection, I don't know to what you're referring, safe handling practices.

Q. (By Mr. Carney) What were the safe handling practices that Monsanto recommended?

A. Avoid prolonged or repeated skin contact, avoid breathing the material in confined spaces or at elevated temperatures.

Q. Doctor, you mentioned a Dr. Kimbrough, and her views about PCB's, and what were her views again? You mentioned what they were.

A. Yes. Dr. Kimbrough's views were that there were no scientifically substantiated proof of any chronic ill effects for PCB with the exception of chloracne. I can quote the article, it's in there someplace.

Q. Okay. I think that's what we might do, let me just before we get to that article I'm going to hand you her article.

A. There's another one, too.

Q. And I;ve got a second one, there are two.

A. Yes.

Q. Before I get to that, let me ask you this about Dr. Kimbrough. Was this the same Dr. Kimbrough that did some rat studies --

A. Yes, Dr. Kimbrough --

Q. -- early on?

A. I'm sorry.

Q. Go ahead.

A. Dr. Kimbrough is a Ph.D. and an M.D., she's a pathologist, she's a toxicologist and in her work with the EPA or with OSHA and NIOSH she has done some epidemiological work. I do not know whether she considers herself an epidemiologist, but I certainly consider her well-versed in it.

Q. Is she a recognized expert about PCB's?

A. Oh, no question, because she's carried the ball for the government for the last twenty years. She was the one in 1970 that did the work with the higher chlorinated PCB's that she stated she found some tumors in rats following the use of -- following the prolonged two year feeding of PCB's. Yes, her present title is Director, Health at Risk Capabilities, Office of the Administrator, Environmental Protection Agency. Prior to that she was the Center for Environmental Health, Centers for Disease Control, Public Health Service, U.S. Department of Health and Human Services, Atlanta, Georgia.

Q. Do you recognize Exhibits K-7 and K-8?

A. Yes, I -- K-84.

Q. I'm sorry, I'm misreading it. K-84 and K-7?

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A. Yes, I do.

Q. Could you identify those documents?

A. Yes. The first, K-7 is a document in the annals -- Annual Review of Pharmacological Toxicology, Pharmacology and Toxicology, 1987, on the Human Health Effects of Polychlorinated Biphenyls, PCB's and she brings in polybrominated biphenyls, which are an entirely different horse.

Q. And what's K-84?

A. K-84 is featured article in the Health and Environment Digest by Dr. Kimbrough, entitled Polychlorinated Biphenyls, How Do They Affect Human Health.

Q. And with reference to these two documents can you tell me what Dr. Kimbrough concludes with regard to health effects associated with a PCB exposure?

A. Well, I will tell you what she wrote.

Q. Okay, if you would.

A. And you can believe what she wrote, I'm sure. She stated on page 106 in K-7, "In conclusion, various toxic effects of PBB's and PCB's have been described in laboratory animals. In humans acute poisoning outbreaks have only occurred following exposure to a combination of PCB's and PCDF's. When humans were supposed only to PCB's or PBB's the only observed acute effects have generally

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been minor. So far no significant chronic health effects have been causally associated with exposure to PCB's or PBB's.

Q. So her conclusion is that no long term health effects have been associated with PCB's?

A. Well, I don't want to paraphrase it, I'll just repeat what she says.

Q. Well, you mentioned some other letters and I'm just trying to clarify it for the jury, because I'm not talking about --

A. PBB is polybrominated biphenyl, which is an entirely different --

Q. I don't care about that, because that's not a subject in this lawsuit. Can you tell me just about PCB's?

A. No significant chronic health effects have been causally associated with exposure to PCB's.

Q. She used the word chronic?

A. Yes.

Q. What does that mean?

A. Long term.

Q. So no long term health effects associated with PCB's?

A. That's correct.

Q. And take a look at K-84, what does she

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conclude there?

A. K-84 she said -- her last sentence, this is on page F-04 to the best of my knowledge in K-84, "Thus, despite positive laboratory animal data and except for chloracne, exposure to PCB's has led to no convincing clinical demonstrable chronic health effects in humans."

Q. And again chronic means no long term --

A. Long term.

Q. -- effects. What is the significance of these conclusions by Dr. Kimbrough to you?

A. Well, I think they are very significant. Here is a government worker who's certainly unbiased, she's not paid by industry or tainted by industry or anything else. She is completely unbiased. She has shown that she has called the shots as she saw it when she talked about tumors in animals. We disagreed with her about some of her findings animal-wise.

But she has worked in this field for twenty years, she's recognized by every department in the government as having excellent credentials and I believe her when she says, "Exposure to PCB's has led to no convincing clinically demonstrable health effects in humans." I think that's very important for anybody interested in PCB's to listen to an expert.

Q. Let me show you some additional exhibits,

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Exhibits K-107 and K-108 and ask you if you can identify those documents?

A. K-107 is a publication, an application data public bulletin published by Monsanto Chemical Company. The title is The Aroclors, Physical Properties and Suggested Applications.

Q. What about K-108?

A. It's the same bulletin, it's probably published a different date, I'm not sure, but the title is the same, The Aroclors, Physical Properties and Suggested Applications. I might mention that Aroclor has been a new name in my deposition, so far so I'll say Aroclors constitutes a group of compounds manufactured by Monsanto, some of which are PCB's, a portion, some of which are not PCB's.

Q. To avoid confusing the jury too much and me too much we'll try to refer when it's an Aroclor that's a PCB we'll try to mention that it's a PCB so we can keep it clear.

A. I'll do the same.

Q. If possible. Are these, both these -- Well, take a look at Exhibit K-108, the last page, does that give you at the lower left-hand corner a date when that was first used?

A. Lower left-hand -- No, because 8-47 -- I

don't know any month that's got 47 days in it. I don't know what that code is.

Q. Okay, you're right about that. I thought that was a date, but but -- 8-47-71 doesn't correlate. Where are these, what did Monsanto publish from time to time technical bulletins about its products and the properties of those products?

A. Oh, yes, they produced a variety of bulletins depending on what stage of development the product was in, whether it was a development bulletin, an application bulletin or if the material were fit for the market and had definite market applications they had sales bulletins.

Q. Did these technical bulletins like K-107 and K-108 also have information in it about the safe handling and the toxicity of the products that were mentioned in those bulletins?

A. Yes, it did.

Q. Let me show you Exhibit K-8. Can you identify that document?

A. Yes. This is a letter dated by L.A. Watt, his name was Lynn, L-y-n-n, A. Watt. He was a chemist and was head of what was called a technical service department of the Organic Division of Monsanto Company. He was in that position when I came with the company and he sort of inherited the role of handling the answers to customers'

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inquiries concerning health aspects of various chemicals. After I came with the company, I came in January of '36, by the time of October 1937 a good part of that information was furnished by me.

But this is a report -- I mean a statement by Watt in which he talked -- Well, I'll read it: I'll give you the last paragraph first. "In talking with Dr. Kelly before these three paragraphs were written we agreed that they might as well be phrased so that they could be used not only in the Aroclor booklet but quoted in correspondence as that may be necessary." And I'll read the first three paragraphs. "Experimental work in animals shows that prolonged exposures to Aroclor vapors --" that's PCB's -- "evolved at high temperatures or by repeated oral ingestion will lead to systemic toxicity."

MR. MC CREA: Systemic toxic effects?

A. Toxic effects, okay. I should mention that this was written in October of 1937 following the first two Drinker papers, and the 1939 Drinker paper came out so we would have not written this had this occurred, this occurred in 1939 because -- Well, because it may have have been true that it was an Aroclor that he tested, a chlorinated diphenyl benzene, so he tested an Aroclor but he did not test a PCB.

So in that sense this memorandum was right, but

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again, it could be confusing. This is an Aroclor. Drinker tested an Aroclor. Drinker said he tested an Aroclor that was a PCB; he tested an Aroclor that was not a PCB.

Q. (By Mr. Carney) Why don't we just -- rather than get off on the Drinker article why don't you read those three paragraphs without comment?

A. But I mean that's very critical, I think, Mr. Carney, because prolonged exposure to Aroclor vapors at high temperature or by repeated oral ingestion will lead to systemic toxic effects. This was written before we had further work on the PCB's, this was written before Drinker's last article. I'll keep on reading it. But the question is still true, this statement is still true, if you get prolonged exposure to Aroclor vapors or evolved at high temperatures or eat the stuff taken by mouth you will get systemic toxic effects.

Q. And what are those systemic toxic effects, is that chloracne?

A. Chloracne in animals does not occur readily. It's awfully hard. As it turned out at Yusho where they had -- they got chloracne from eating PCB's that were Japanese PCB's that were contaminated with furans.

Q. I guess I did not make myself clear in my question. Is chloracne a -- would you call that a

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systemic toxic effect?

A. Yes.

Q. And what do you mean by -- I guess while we're on the subject we might as well cover it; what did do you mean by systemic toxic effect?

A. Well, toxic is harmful, systemic means general, the whole system, it's not a local injury.

Q. And results of the toxic effect is some pimples; is that right?

MR. MC CREA: Objection, leading.

A. The results of the toxic effects, systemically, when taken by mouth can lead to liver problems and if you take enough of the material you can get death.

Q. (By Mr. Carney) Why don't we, because I think we got off the track here. You were going to read these three paragraphs in K-8. Why don't you just read those three paragraphs?

A. I'll start over.

Q. And if we need to comment about them, we can --

A. "Experimental work in animals shows that prolonged exposure to Aroclor vapors evolved at high temperatures or by repeated oral ingestion will lead to systemic toxic effects. Repeated bodily contact with the

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liquid Aroclors may lead to an acneform skin eruption --" that is chloracne. "Suitable draft ventilation to control the vapors evolved at elevated temperatures as well as protection by suitable garments from extensive bodily contact with the liquid Aroclors should prevent any untoward effects."

Q. And is that language that you approved to be put in Aroclor booklet back in October of 1937?

A. Yes.

Q. And this document K-8 that you are reading from is dated October 11, 1937?

A. That's correct.

Q. Did you -- Who was, who approved the language that would go in technical bulletins and warnings that would go out to customers about PCB's and other products of Monsanto?

MR. MC CREA: Objection to the leading nature of the question, particularly as to the use of the word warnings.

Q. (By Mr. Carney) Well, let me take out warnings. Who would have approved at Monsanto during the time you were the head of the medical department the language that would go into the bulletins and the information that went to Monsanto's customers about the safe handling of Monsanto's products?

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MR. MC CREA: Again, are we talking about the time period of '36 to '74?

Q. (By Mr. Carney) Let's say the time period after World War Two, 1946 to 1974 when you retired?

A. After 1946 on that would be the medical department. It was somewhat less formal in the years from 1937 to 1942.

Q. But who, was that --

A. That was also medical department, that's right. As you can see here Watt talked over with me what they were going to be put in the bulletins.

Q. So it was informal that you did the approval prior to World War Two and after World War Two it was more formal that you would do it?

A. That's correct.

Q. And who received these technical bulletins, Exhibits K-107 and K-108?

A. Anybody who is interested in the Aroclors and anyone that the salesmen thought, the development people thought was a potential customer.

Q. Would it include potential customers and customers?

A. Well, it's an application bulletin. Certainly if a person was a customer he would receive this, there might very well be a subsequent one, a sales

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bulletin that would go along with it.

Q. Did the language that was in these technical bulletins and other documents that went to the customers of Monsanto vary greatly from year to year?

A. Well, I don't exactly know what you mean by greatly, no. I would say no with the exception we're still talking about PCB's?

Q. Yes.

A. With the exception that when the environmental problems with PCB's surfaced in the late sixties, early seventies, environmental warnings were placed on the containers of PCB's.

Q. Let me next show you --

A. Do we need these?

Q. Why don't you, you can -- I think you can put these your table. We'll get rid of some of those at the next break. Let me show you some additional exhibits. I'm going to show you Exhibits K-88, K-90, K-91, K-92, K-93, K-94 and K-95 and ask you if you can identify those documents?

A. Yes. K-88 is a document that is also an application bulletin on the Aroclor, it's labeled there, it's labeled Physical Properties and Suggested Application. In other words, this is a bulletin that the technical people put out to see if anybody was interested

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in a product with these physical properties and they suggested where it could be used.

MR. MC CREA: Excuse me, Doctor, did you have a date on that?

MR. CARNEY: I don't think --

THE WITNESS: I don't think that I did have some dates labeled. I don't have any of these.

MR. CARNEY: Unless it's in the document you might have to get somebody else to date that.

Q. (By Mr. Carney) Maybe to short-circuit this, Doctor, are all these exhibits that I just handed you, are they various technical bulletins that contain information about PCB's that Monsanto had printed?

A. Yes. Well, with the one provision that they, when you talk about it generically, Aroclors, also it includes some compounds that are not PCB's.

Q. But all these documents were technical bulletins that included information about PCB's?

A. Yes, they all include information about PCB's, the last four are completely about PCB's.

Q. And by the last four I guess you better identify --

A. Well, K-92, which is The Proper Handling of Aroclor in Air Mixtures in the Electrical Industry. K-93 is The Askarel Inspection and Maintenance Guide, K-94 is

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the same thing, K-95 is the same thing, Askarel Inspection and Maintenance Guide, but it seems like there's some revisions.

Q. Some of these exhibits that you just referenced refer to Askarel, do you know what Askarel?

A. Askarel I believe is the trade name for Monsanto's PCB's for the electrical industry. I take that back. I believe it's more widespread than Monsanto. Askarel is a generic name for the fire resistant liquid insulation and coolant first used by General Electric in 1932.

Q. But Askarel, the main thing I think is Askarel is a PCB?

A. That is correct.

Q. Take a look at Exhibit 92, the first page of that exhibit?

A. Yes, sir.

Q. Is that document dated on the first page?

A. Yes. That's dated May the first, 1956.

Q. What about Exhibit 93?

A. Huh?

Q. Could you look at Exhibit 93 and see if --

A. Yes. I'm looking at 93.

Q. I'm sorry. I don't see it right offhand on 93, but I do on 95. Is there a date on the top of the

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first page?

A. I'll get 95. Yes, that's a -- it's dated there, 1975, but those are --

Q. What does it say up there, just for the record. Is it revised March of 1975, is that accurate?

A. Well, it says it here, that's different, I don't know when it was put on, and I don't know -- it's different print but the rest of the front so I can't be positive about the date, that's what it says, but --

Q. At any rate, Doctor --

A. Somebody decided this was revised March 1975.

Q. Let me next show you some additional exhibits, Exhibits 97 and 99 through 106 and I'll ask you as soon as I get my hands on them if you can identify these documents.

A. Yes. These are material safety data sheets on United States Department of Labor forms that are dated May of 1971. They deal with products of Monsanto manufacture. Some of them -- Well, two of them are -- use Westinghouse trademarks.

MR. MC CREA: Can you identify those numbers please?

THE WITNESS: K-97 as Inerteen 70 dash 30, which is a Westinghouse trademark. K-99 is the trade name an Inerteen 100 dash 42.

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Q. (By Mr. Carney) Is Inerteen a PCB?
A. Yes.
Q. That's the Westinghouse name for PCB?
A. Yes.
Q. All of these exhibits that I have handed you, 97, 99 through 106 are material safety data sheets related to PCB's?
A. Well, I have got one here that I don't know much about. Well, they say Chlorinated Aromatic, Inerteen 54201-KJ, that one I don't know much about.
Q. Which one is that?
A. That is K-102.
Q. With the exception of that exhibit are all the other exhibits that I've handed you, 97 and 99 through 106 safety data sheets for PCB's?
A. Yes. This might very well be one, but I don't know.
Q. What is a material safety data sheet?
A. Well, it just is what the name implies, it talks about a material, product. Safety means, safe from harm, data means a collection of information and the sheet is the form. So really what it is is a memorandum or a condensed one or two page bulletin that describes what company manufactured the material, what their address was, what kind of a product it is.

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Then they talk about the hazardous ingredients, they talk about the physical data, whether it's a liquid, solid, what its vapor pressure is, they talk about the fire and explosion hazard, they talk about the health hazard data, they talk about what happens when it burns.

Q. Is one of the -- Okay, I'm sorry.

A. They talk about what happens if there's a spill and special precautions.

Q. Is -- What was the purpose for filling out these material -- I take it these are all the material safety data sheets on PCB's that Monsanto prepared?

A. That's correct.

Q. And what was the purpose in giving information out on special protection information and spills with regard to handling of PCB's and the health hazards of PCB's, what was the purpose of having that information in these safety data sheets?

A. To prevent -- this was used both in transportation, whether it's a truck or railroad car or something of that sort or in the receiving person's plant, whether it was a plant or it could very well be a manufacturing -- or this manufacturer's agent. Well, anyway, the customer would get this, and it would give them information that was valuable to them in case any of these things occurred, in case there was a leak, told them

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what to do with about the special precautions. This was mandated by the Department of Labor.

Q. And did someone in the medical department approve the language relating to toxicity and safe handling of PCB's on these material safety data sheets that were Exhibits 97 and 99 through 106?

A. Yes, we approved Section 5, Health Hazard Data, Section 8, the Respirators and Special Precautions, Section 9. We approved Section 8, the Special Precautions in conjunction with the safety department.

Q. And if you'd look at the bottom of the last page of these material safety data sheets, are they dated?

A. Yes. First three were in February of '72 -- oh, there's January of '72, looks like they're all '72. I'm not to the end yet.

Q. I don't think you need to read all the dates, I just --

A. Yeah, but I think it's all early '72.

Q. Okay.

A. Yes, I would say they are all early '72.

Q. And at any rate they all have dates?

A. That's right.

MR. CARNEY: Why don't we take a brief break, I'm going to change the subject and we can change the tape again.

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(Whereupon, a short break was taken.)

Q. (By Mr. Carney) Dr. Kelly, I have just handed you Exhibits K-9 through K-18, and ask you if you can identify those documents for the record please?

A. Yes, I can. K-9 is a label for Aroclor. It's a Monsanto label, "Avoid repeated contact with skin and inhalation of the fumes and dust."

Q. Do you have a knowledge as to the date of that label?

A. Yes. I've been through this label business on quite a few depositions and I have spent a good part of the day trying to have a deposition, so together with paralegals, some of the lawyers and some of the technical people at Monsanto I -- we ran down the dates as well as we could. This was sometime pre-1947.

Q. Are all -- Well, why don't you go through these exhibits?

A. Okay. Then K-10 is also a Monsanto label, it's Chlorinated Diphenyl, Technical, that's a PCB of course. It's a label that's dated -- it's not dated on it, but it's from our research it was 1977. We have then a caution label, Hydrocarbon -- a chlorinated hydrocarbon caution label, K-11. That was early 1960, it get a Mon -- it's put on Monsanto products, whether or not this is the same caution label put on all chlorinated hydrocarbons or

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not I'm not sure, but that's dated around 1960.

Q. Let me stop you there, Doctor. K-11 is a little hard to read and what I'd like to do is show you a blowup that I believe depicts Exhibits K-9 and K-11 which might be easy -- if you can say, is K-9 represented on this blowup at the bottom here?

A. Yes, it's where your right hand is, it's at the lower lefthand corner.

Q. And where is K-11 on this blowup?

A. K-11 is right above it, and it's highlighted in yellow, starts off "Caution, contains chlorinated hydrocarbons."

Q. Can you read the caution on K-11?

A. Yes. The one on K-11 is not only highlighted up at the top it's also the same on the right-hand column. So it says, "Avoid prolonged breathing of vapor or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs remove by washing with soap and water. Following eye contact flush with water. If clothing becomes soaked with fluid launder before wearing again."

Q. And is this kind of caution language that was used by Monsanto to alert its customers about safe handling of PCB's?

A. That's correct, sorry.

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Q. And is that the with minor variations the language that was used during the time that you were medical director at Monsanto?

A. Well, when -- Yes, from '60 on, I don't -- early '60. I don't know if it was used that particular phraseology was used, but yes, in general it's true.

Q. Okay. Why don't you go on with K-12?

A. K-12 is an Inerteen label. It's a Monsanto label, I'm sorry, it's a Monsanto label. But it's Inerteen 70 dash 30, this is K-12 we're talking about. On the label it says, "Made for Westinghouse Electric Company, trademark at Westinghouse Electric Company," and it has the same caution material that was present on the blowup.

MR. CARNEY: And I don't know if they are, if you have any objection to trying to zoom in and see if it's --

MR. MC CREA: No, that's fine.

Q. (By Mr. Carney) That's again a Monsanto label and it's for the Inerteen which again is the Westinghouse trade name for PCB's?

A. That's correct.

Q. And what was the date?

A. I should say for Westinghouse it's a trade name for electrical fluid that contains PCB's. In this --

in addition to other things, it also contains, presumably the thirty refers to trichlorobenzene.

Q. And what's the date on that Exhibit K-12 that we are looking at?

A. That's 1965.

Q. And let's take the next one, it's K-13.

A. K-13. This is a Monsanto label that we put on containers following the discovery that the material could be an environmental contaminant. The date on it --

Q. And that again I think you mentioned was when?

A. 1970.

Q. Then the next was K-14.

A. That's another Inerteen, that's another Inerteen label which also contains the environmental statement. The date of that is July of 1970.

Q. And then K-15?

A. K-15 is another Inerteen label, also Monsanto label, but the product is Inerteen, the Westinghouse product, and in addition to the environmental statement the waste disposal offer is made on it which we offered to take back the used PCB's for incineration. The date of that is July '71 to 11/72. I don't believe there are any -- I'm not sure how definite, it was someplace in there.

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Q. Okay. And --

MR. MC CREA: Did Dr. Kelly state this was PCB?

Q. (By Mr. Carney) The Inerteen 70-30, is that a PCB, if you know?

A. Yes. To the best of my knowledge Inerteen contains PCB and the 70 refers to a 70 percent PCB and the 30 refers to trichlorobenzene which we added to PCB's to form Inerteen for Westinghouse. This was Westinghouse specifications for one of their electrical uses. It contains PCB's, yes, at least seventy percent.

Q. And did we do K-16, is that next?

A. That's the next one.

Q. Yes.

A. That again is a PCB label and it also has a waste disposal on there and I believe that was used from 11/72 to 6/75.

Q. And what about K-17, can you identify that?

A. K-17 is a multi-language label for tank cars; that was used from 1972 I believe to 1977 and not -- yeah, that was used at that time.

Q. And then finally K --

A. Oh, this is one that I am not so sure about the date on it but it's a tank car label for PCB's and I would say that it was sometime in the neighborhood of 1972

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on.

Q. When you say tank car label, did PCB's -- are they normally in a liquid form?

A. Yes.

Q. When they are sold to customers?

A. They are either 55 gallon drums or 6,000 gallon tank cars.

Q. And the labels, would the label be put on the cars and tank drums?

A. That's correct.

Q. Why didn't you put the labels on the PCB's themselves?

A. Float them on there?

Q. There is no way to put them on a liquid, I take it?

A. No.

Q. And did you or did the medical department under your supervision at Monsanto approve these, the language in these labels at least up until your retirement in November of 1974?

A. Well, yes, we approved that part of the label that referred to the safe handling procedures and we had input unto the environmental aspect, when that came into play.

Q. And that would be true of Exhibits 10 through

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18?

A. Yes. We didn't have anything to do with saying sell it back at three cents a pound or something like that.

Q. Dr. Kelly, during the time that you were medical director at Monsanto did you have any philosophy with regard to a goal to be followed in writing safe handling instructions for something like PCB's?

A. Yes.

MR. MC CREA: Just a second. Are we asking if he, Dr. Kelly, had a philosophy?

MR. CARNEY: Yes.

A. Yes. My philosophy was to keep the information as precise as could be done for protection, to keep it as short as possible to keep the reader's attention. I would rather have a one or two paragraph warning than a three page bulletin because my experience over the years has been that people rarely go past the first paragraph if you have a three page memorandum on safety.

Q. (By Mr. Carney) Dr. Kelly, at the time you retired from Monsanto in 1974 did you have an opinion to a reasonable degree of medical certainty whether the safe handling instructions were followed that appear on Exhibits K-9 through K-18 that the PCB product could be

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used without ill effects?

MR. MC CREA: To which we'll object; the question implies that Dr. Kelly is an expert in warnings as to the effectiveness of the design in communicating to the user the need to take appropriate precautions for his health and safety and the answer which Counsel is attempting to elicit implies that these warnings, so-called warnings, although I don't see the word used ever, would communicate the information and I think that's beyond the realm of Dr. Kelly's expertise.

MR. CARNEY: Okay. I'll give you that same objection. Let me restate the question so it's fresh in Dr. Kelly's mind.

Q. (By Mr. Carney) Dr. Kelly, at the time you retired from Monsanto in 1974 did you have an opinion to a reasonable degree of medical certainty whether if the safe handling instructions that appear on Exhibits K-9 through K-18 were followed that PCB's could be used without ill effects?

A. Yes. I was quite certain during those thirty-eight years we manufactured a billion and a half pounds of the stuff, sent it all over the country and there are no reports of any ill effects from it in our workers with the exception -- not only our workers, no case reports from any other, about any of the customer's

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workers, no reports of any illness from any of the customer's medical directors or any of the customer's manufacturing people, that -- So my answer is yes. I was quite certain that it was proved perfectly safe, perfectly adequate.

MR. MC CREA: We would object to the answer as not being responsive to the question. The question addressed to the witness was if this information were followed would the product be safe. The question addresses the communication. Dr. Kelly is incorporating into his answer hearsay testimony that there were no reports of adverse effects.

By answering it in that fashion he has completely avoided the question, his answer is there were no effects, that's hearsay. The question was if these warnings were to be followed based on his knowledge of the toxicology which he has described would the product be safe. It has nothing to do with the lack of reports.

MR. CARNEY: Let me reask the question. I think the doctor did answer the question, but just so there is no confusion why don't I ask it again.

Q. (By Mr. Carney) Dr. Kelly, at the time you retired from Monsanto in 1974 did you have an opinion based on a reasonable degree of medical certainty whether safe -- if the safe handling procedures in Exhibits K-9

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through K-18 were followed that PCB's could be used without ill effects?

A. Yes, I did.

Q. And what was that opinion?

A. They could safely be used without ill effects.

Q. If the safety precautions were followed?

A. Yes.

Q. And what is that opinion based on?

A. It's based on my knowledge of the toxicity of the product. It's based on my reviews of the literature. It's based on my contacts with the people who used it, the medical personnel who used it, the industrial hygiene people who used it and it's based on significant absence of any reports of ill effects in the medical literature in the electrical field or in the medical literature with the exception of chloracne. There were no ill effects, so I can't base it on anymore than that. They read the warnings and they had no troubles.

MR. MC CREA: All right, now, that's gross hearsay based upon information from whomever, wherever. It does not incorporate into the answer the critical aspect of the question, "If this information were followed --" Dr. Kelly jumps to the conclusion, no reports of ill effects. Dr. Kelly has no data as to

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whether or not this information on these labels was adhered to by workers and that was the essence of the question.

He assumes it was because there were no ill effects. That's not the point. The point is did the workers if they had received this information, adhere to it. No data, no information, no studies as to whether or not any worker would appreciate the risk of PCB's from reading these warnings.

MR. CARNEY: I'm not going to respond to your speech, because I just think that will prolong things other than to at least to say that my silence on your objections or speeches does not mean that I acquiesce in what you're saying.

Q. (By Mr. Carney) Doctor, I asked for your opinion at the time of my retirement in my last question, did you have the same opinion on that subject during your lengthy employment with Monsanto?

A. I had the same opinion from 1937, sometime when I got involved with PCB's until 1974 and from 1974 until May the 30th, 1990.

Q. It's the 31st.

A. The 31st.

Q. Did you he -- Let me show you the next exhibit, K-19. Would you read the title and the -- Strike

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that. Did you ever see that document during the time that you were employed by Monsanto?

A. I never did. I never saw it until it was shown to me at one of these depositions.

Q. And was this a document ever utilized by Monsanto?

A. I never heard about this document, I never saw it used by Monsanto, I never had anyone mention the document during the years that I came back from the service until I left.

Q. As far as you know was this document ever used by any salesmen at Monsanto?

A. As far as I know there was absolutely -- it was never used. There's really no use for it because in 1944 Aroclors were in allocation, we did not have salesmen going out trying to sell it. We had salesmen on the telephones answering the question saying, "Well, send me your government order and we'll send you the amount of Aroclors that the government says we should send you." We didn't have salesmen running around trying to sell people. So I have no idea. This is not an official Monsanto document, I don't know whose brain child it is.

Q. Why do you say it's not an official Monsanto document?

A. Well, Monsanto does not put typewritten

documents that are not published, this has material in there that's absolutely nonsense and it would not be a Monsanto document.

Q. Does it have any Monsanto code or anything on the back?

A. No, sir, it has no signature, it has no code on the back.

Q. Do you know who the author was?

A. I haven't the slightest idea.

Q. If this document K-19 had been presented to you for your approval back when you got back from World War Two, what would you have done?

A. Thrown it in the waste basket.

Q. Why is that?

A. Because, several things, one, is it tries to do everything, it tries to encompass everything in one bulletin, it has gone back historically and talked about applications where Monsanto to the best of my knowledge never used PCB's. It has information on there medically that is incorrect. So I can't say that we're not -- I don't believe it's worthless, I believe it's completely worthless.

Q. Doctor, during the course of your employment did Monsanto have tests performed in relation to the toxicity of PCB's?

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A. Yes, they did.

Q. And did Monsanto perform these tests in-house or did they have others do them?

A. No. We did not have a laboratory until after -- I think '75, we started preparations for a laboratory just about the time when I was leaving in 1974.

Q. And were most of these tests animal tests except for the skin patch test?

A. Yes, with the exception of the skin patch test.

Q. Why were these tests done on animals?

A. Well, I don't believe it's morally correct or ethically correct to experiment on people.

Q. Are the results of animal testing easily useable to predict the potential effects of a particular substance in humans?

A. Well, I have to answer that yes or no. There are some ways it's helpful, some it isn't. Now the animal species vary. If they can show a target organ, if you get the same sort of response in several species of animals. If they're all for example involves -- you get brain tumors in all the animals, you would think well, maybe you'd get a brain tumor in humans. If you get a liver problem in all of them you would think well maybe you will get a liver problem, that's the thing you look out for.

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MR. MC CREA: Excuse me, Doctor, let me interpose an objection that there is no basis for the doctor's qualification in toxicology, which this involves toxicology. There are other people at Monsanto that are qualified to discuss animal testing.

Q. (By Mr. Carney) Doctor, if one species of animal you get a particular effect by a substance does that mean it will happen in humans?

A. No, it does not.

MR. MC CREA: Is it understood same objection, Counsel?

MR. CARNEY: Yeah.

Q. (By Mr. Carney) Let me show you Exhibit 20. Can you identify that document, Exhibit K-20?

A. Yes. This is a report of Dr. Frederick Flynn of patch testing on material received from Swann Research, Incorporated. The date is May the 5th, 1934.

Q. What's the -- Read that date again. I think you might have misspoke.

A. May the 25th, 1934.

Q. I thought you said May 5th the first time?

A. No, 25th.

Q. Yeah. Have you ever seen Dr. Flynn's report before?

A. Yes, I have.

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Q. Did you see that document back in shortly after the date it bears?

A. Not shortly after. I never saw it until I came to work at Monsanto, some six or seven months after I came to work at Monsanto.

Q. So it would have been sometime in 1936 you saw it?

A. '36, yes, late '36 probably.

Q. Briefly, Doctor, what type of PCB testing did Dr. Flynn conduct?

A. He did patch testing, it appears.

Q. On what species, if you --

A. I don't see it right off the top of my head here. Says on animals, but let's see what his conclusion was. It's not on humans.

Q. I think it was rabbits?

A. Large white rabbits, that's correct.

Q. And did he test PCB's of various degrees of chlorination in his tests?

A. Yes. He tested quite a mixture of things, he tested an Aroclor with sixty -- a PCB with 62 percent chlorine, he tested the same Aroclor with four and a half percent styrene four and a half and a mixture of styrene high boiler --

Q. I don't think we need to get the jury

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involved in all these numbers and details.

A. Yes. Well, he tested liquid PCB's, ground up PCB's.

Q. What did Dr. Flynn concludes as a result of his rabbit skin patch testing on various types of PCB's?

A. By the way, he also did intradermal, that means into the skin, he injected the liquid material into the skin. Well, he concluded that each of the Aroclors that gave a positive reaction were of a fluid nature. He also said that any styrene found, compound which could be found that were present as impurity is the cause of the trouble. He said he was also surprised that more of the compound submitted did not show or give reactions to the skin.

It has been shown in some -- Well, they get into some very archaic statements here, but that's about what he said. He said -- he also gave some ideas which were very good. "Study your ventilation system in places where fumes were given off, means be provided for men to take a bath with soap and water if they come in contact with the type of material found to be positive." By this I mean if a leak or spillage occurs.

Q. So he gave some safe handling suggestions in handling PCB's?

A. That's correct.

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Q. Let me show you Exhibit 21 and ask you if you can identify that?

A. Yes. This is a report dated September 15th, 1938 by Cecil -- by Dr. Drinker, a report to Monsanto Company that deals with four products, first two have nothing to do with this case. The second two, one is a chlorinated PCB, 68 degrees chlorine, and the other is a mixture of chlorinated diphenyl benzene and chlorinated diphenyl, which are -- one is a mixture of a PCB and a mixture of a compound which is not a PCB, a terphenyl.

Q. Did you review this report back in the late 1930's?

A. Yes, I did.

Q. And these were rat inhalation experiments?

A. Let's see what animal was used. Yes.

Q. What did Dr. Drinker report to Monsanto in the relation to the results of his rat inhalation experiments with PCB's?

A. He reported that he had these rats inhale the material at a concentration of somewhat over a half milligram per cubic meter into the -- he had to heat the material up to 140 to 190 degrees centigrade to get the material in sufficient concentration in the air. He exposed them for sixteen hours a day and he continued that for almost three months, four months.

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He got some swelling of the liver cells but were not progressive. They were, the rats were healthy, they gained weight. Then he gave them carbon tetrachloride and alcohol which carbon tetrachloride is a very serious liver poison and the rats died 52 days later. He also decided at the end of 93 days that this wasn't tough enough so he -- and I'll quote who it says, "After 119 days at low concentration of 12-60 A --" which is a PCB -- "had improved but slightly poisonous it was decided to increase the concentration of the air breathing by the four rats remaining."

So he had to get four of his gadgets to get the stuff in the air, so he brought it up twelve times as much, twelve time as high. He continued the exposure, I quote him, "to this very high concentration and was continuing it for 87 days." He said, "Under these conditions the animals remained in perfect health. The carbon tetrachloride and alcohol test was positive, but there was no evidence of liver damage or no evidence of disturbance in other organs.

Q. Did he see any gross evidence of abnormalities on other parts after he examined these animals after they were sacrificed?

A. He saw no gross abnormalities, but he saw some microscopic, he saw some --

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Q. Did he see anything to the naked eye that would be unusual?

A. No. Nothing to the naked eye, but he did see material, he saw some changes in the liver cells which --

Q. That was microscopic?

A. Microscopic, that's correct.

Q. And he was dealing with one of the highest chlorinated PCB's, wasn't he?

A. That's correct.

Q. And what was his general conclusion after the concentrated vapor that he exposed these rats to for three or four months with this very high chlorinated PCB?

A. Six months, six and a half months, 207 days.

Q. Okay.

A. Page 7 it says, "In conclusion, 12-78 when handled in ordinary precautions should be entirely harmless to workmen."

MR. MC CREA: What page is that?

THE WITNESS: Page 7.

A. It says while it can't be given an entirely, totally clean bill of health it is preferable to these two other compounds.

Q. (By Mr. Carney) Was there anything in Dr. Drinker's reports to you that is inconsistent with your opinions that you held about the ability to handle PCB's

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safely in a work place?

A. No. There was nothing inconsistent with my ideas.

Q. Let's next look at Exhibits K-22 and K-23 and K-24 and ask you if you can identify those exhibits?

A. K-22 is a report by doctor Joseph Treon of the Kettering Laboratory, which is in the College of Medicine of the University of Cincinnati Medical School. It has to do with exposure, vapor fumes of Aroclor at elevated temperatures of Aroclor 1242 and 1254, both of which are PCB's.

Q. Do all three of these reports, are the Kettering laboratory reports on animal testing of PCB's?

A. That's correct.

Q. And Kettering is a laboratory where did you say?

A. University of Cincinnati, it's part of their medical school.

Q. Was this a large laboratory?

A. For those days in 1955 it was probably the largest one, maybe Harvard was bigger; but the only two ones, might -- probably two, there might have been a little at the University of Pittsburgh, but Cincinnati certainly if it wasn't the biggest, it was the second biggest.

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Q. And did you request that this testing been done?

A. Yes, I did.

Q. At the laboratory at the University of Cincinnati?

A. Yes, I did.

Q. And what type of testing was done in these tests? Was it -- were these inhalation tests?

A. Two were, yes, two were inhalation, two were inhalation of the fumes and the other was a mist like an aerosol.

Q. And again just to make sure that we understand, inhalation means what?

A. You breathe it in.

Q. So you would elevate the temperature and make vapors?

A. Well, you put the animals in a sealed box, pretty good size box and then you would put this material, heat it and blow air through it to pick up the vapors and blow them into the cage and leave the animals in there for X period of hours, X number of days.

Q. And these tests that you just described, were they done on various types of animals?

A. Yes. He had a sort of mixed bag of these, he had guinea pigs, rats, rabbits --

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Q. What were the --

A. Maybe mice also. I know he had guinea pigs, rats and rabbits and I think he had mice also.

Q. What were the results of these tests by the Cincinnati University laboratory called Kettering with the vapor being put into the enclosed containers where the animals were in, the PCB vapors were put in?

A. Well, he found out if you put enough of material in you can cause fatalities in the rabbits, he also found out -- I mean in the animals. Then he also found out if you drop the level down you could come out at a safe level where you don't have any problems, so the bottom line of this experiment was to find out what was a safe level. So he came out with a safe level and that safe level was adopted by the American Conference of Government Industrial hygienists.

MR. MC CREA: I'm going to object to that response as being outside the scope of this document. There is no showing in this document based on this study that the level was adopted.

Q. (By Mr. Carney) Doctor, he found that safe levels for these various species of animals for these PCB vapors and how did he correlate that to safe levels for -- go from animals to humans.

A. He took a tenth or a hundredth of it, I'm not

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exactly sure unless I go through these calculations. He came down to a much safer level where he said, "Well, it's safe for animals, at a hundred times, it's okay for people."

Q. And does -- did the report indicate how they got these large levels of fumes in the air, into these confined cages for these animals?

A. Yes, I am sure it does. I'll find it here. Well, they heated -- I'll have to tell you how high they got the temperatures.

Q. They heated it above room temperature?

A. Oh, gosh, yes. He took 1242 and he heated it to between 132 degrees and 138 degrees centigrade, hundred degrees centigrade is boiling at the point of water.

Q. Do you know roughly how that translates into Fahrenheit, just approximately?

A. Well, water boils at 180 degrees Fahrenheit, so this is 200 and something Fahrenheit.

Q. Okay.

A. Then 54 --

MR. MC CREA: What page, Doctor?

A. He used the same, 130 to 135 degrees centigrade.

Q. (By Mr. Carney) What page are you looking at there, Doctor?

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A. Six.

Q. Page 6 in exhibit --

A. K-22.

Q. Dr. Kelly, could you tell the jury whether after you reviewed these reports back in 1955 that were sent to you and that's again Exhibits K-22, 23, and 24, did those reports change any of your opinions with regard to the toxicity and safe handling of PCB's in the work place.

MR. MC CREA: To which we'll object for the reason there is no showing of Dr. Kelly as a medical doctor and not a toxicologist is in any way able to correlate the information from the animal studies to human beings.

A. Will you repeat it?

Q. (By Mr. Carney) After you reviewed these three reports from the University of Cincinnati laboratory called Kettering and that's Exhibits K-22, K-23, K-24, did your review of those reports cause you to change any of your opinions with regard to the toxicity and safe handling of PCB's in the work place?

A. Based on my experience in medicine in 1924 or twenty years before, based on my experience with familiarity of a toxicological information, based on my experience with discussions with toxicologists these

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reports did not change my mind at all.

Q. Were they consistent with your views?

A. They were consistent with the views that I had gained over the twenty years of occupational medicine where I was constantly exposed to toxicology, reports of toxicological matters.

Q. Did Dr. Treon who authored these three reports that were sent to Monsanto, did he ever publish his findings related to the toxicity of PCB's?

A. Yes, he did.

Q. Let me hand you Exhibit 25 and ask you if that's the publication of the results of his reports to Monsanto?

A. Yes. It was published in the Industrial Hygiene Quarterly, cannot make out the date but he gave the paper in 1956, it seems to me. So it was published in either late '56 or early '57.

Q. Did you read the article at the time it was published?

A. Oh, yes.

Q. Was the Industrial Hygiene Quarterly a well-known publication at that time?

A. Yes.

Q. Was it a reputable publication?

A. Oh, it's a peer review publication. Peer

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means you send it around to the other authorities in the field, you get a paper and send it around to the other people and they look at it and say, "Well, it looks like it's based on good scientific evidence," and they send it back to the editor and say yes, we ought to publish it.

Q. And did Dr. Treon in the published article, Exhibit 25, did he give the conclusions that he gave in the prior reports that we were looking at that went to Monsanto?

A. Yes.

Q. Let me hand you next a series of documents that we have marked K-26, Exhibits K-26 through K-36 and I'll ask you if you can identify those documents?

A. K-26 is a report from the Younger Laboratories on Aroclor, on a particular Aroclor, 1270, ammonia reaction product. It is an acute study in which the oral lethal dose, oral dose that kills half the rabbits -- of the rats is found, tested the skin irritation and eye irritation.

Q. Let me maybe just short-circuit, let me just ask a couple of general questions rather than go through each one separately. I think it will go quicker. Are K-26 through K-36, are they ten different reports from the Younger Laboratory dated between July 9, 1957 and March 4, 1963 relating to acute oral toxicity tests performed on

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animals using Monsanto's PCB's?

A. Not all of them, Aroclor 2565 is not a Monsanto PCB. That's a terphenyl, that's a different compound.

Q. Which exhibit is that?

A. That's K-35. K-36 is Inerteen PPO, which is a Westinghouse product, manufactured presumably by Monsanto.

Q. Are those -- That's a PCB though, the K-36?

A. Yes. I don't know what else is in it, what's the PPO is.

Q. What about K-35, is that a PCB, if you know?

A. No, 2565 is not a PCB.

Q. With the exception of Exhibit K-35 are the other exhibits that I handed you, K-26 through K-36, are they all animal tests involving PCB's that were done by the Younger Laboratory from July 9, 1957 until March 4, 1963?

A. Yes.

Q. Who requested that these tests be performed by Younger?

A. The medical department. The medical department, which is either myself or Mr. Wheeler.

Q. Monsanto?

A. Monsanto medical department.

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MR. MC CREA: We would object to this as hearsay. There's no showing that the documents have been peer reviewed.

Q. (By Mr. Carney) Well, were these reports received by you or by the medical department on or about the date they bear, that's Exhibits K-26 through K-36?

A. Yes. The documents say tests conducted for Monsanto Chemical Company, St. Louis, Missouri, and they were received by the medical department. We were the only one that sent the material out to Younger Laboratories.

Q. And Younger Laboratories is an outside laboratory that did the tests for Monsanto?

A. That is correct.

Q. Some of these tests involve acute -- or I think they all involved acute toxicity testing. What's meant by acute?

A. They all involved acute testing. Acute means you see what the immediate response to a large dose is. In other words, when you feed the animal you try to kill the animal, you try to find the dose that kills half the animals. That's a sort of a benchmark that you use in comparing the toxicity of one compound with the another. It's called LD 50. I don't want to confuse the jury but that means lethal dose fifty, and that's what kills half of the animals.

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Q. By this kind of testing means you feed enough a compound until you kill half of them?

A. Yes.

Q. And then you found the LD 50?

A. Yes.

Q. And that was kind of benchmark that was used back at that time?

A. Well, it still is. In other words, if you got a product X that's got an LD 50 of two, you've got a product Y that's got an LD 50 of twenty, the higher the lethal dose that it takes, the higher the number is, the less toxic it is. So relatively you would say, yeah, this is from the acute point of view this is 1/10th as toxic as product X.

Q. Are most products, even products that human beings eat, can they be toxic enough to kill you if you get enough quantity?

MR. MC CREA: Again, objection. Dr. Kelly is not a toxicologist. There's no showing that he's made any studies of comparative toxicity of any chemical with PCB's, its contaminants and bi-products.

A. Question again please?

MR. CARNEY: Yes. I'll give you the same objection.

Q. (By Mr. Carney) Are most compounds or most

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products, even products that humans consume or eat, can they kill you if you give enough?

A. You want to start with alcohol, you want to start with aspirins? If you take enough aspirins you'll kill yourself. You take enough bourbon you'll kill yourself. A couple of glasses of bourbon you'll kill yourself. That's water glasses, not shot glasses.

Q. I think I've seen people have a couple of shot glasses of bourbon. And are most compounds used in the workplace if taken in sufficient quantity, will they kill animals?

A. Oh, yes.

MR. MC CREA: Same objection. There is no foundation as to this doctor's qualification to discuss relative toxicities, none whatsoever.

Q. (By Mr. Carney) Well, go ahead.

A. Yes. All industrial chemicals have some toxicity. It varies in amount. All drugs that people take have toxicities. From a drug you take for heart disease to a drug you take for lowering your cholesterol they have toxic properties if taken in large amounts.

Q. And do all these drugs, do they all have an LD 50 level?

MR. MC CREA: Same objection. Far afield, no qualification to discuss relative toxicities of any

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chemicals, not even PCB's.

A. If -- I'm sure they all would have a LD 50 if you ran them. I'm sure they have been run by the pharmacological companies when they started out thinking about using this prescription drug that's the first test you use in a toxicological screening.

Q. (By Mr. Carney) And why did you request these acute toxicity tests be run on PCB's from 1967 to 1953?

A. It was part of our ongoing study of our products. PCB's were not the only compounds we tested this way. There are certainly a lot of other ones and it depends, I think there may have been new products coming out of the research department, there may have been new applications that we just wanted to check it out.

Q. What, if anything, did you learn from these LD-50's that were reported in these Younger Laboratory tests, K-26 through K-36 with the exception of K-35 which I don't think related to PCB.

MR. MC CREA: Same objection. No peer review.

A. There were no surprises in these tests. The LD 50's were around four milligrams per kilogram, which was roughly around the same as Drinker found in 1937, so they all have around the same toxicity.

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Q. (By Mr. Carney) How would you describe that toxicity, is it a mild, heavy --

A. I don't know he used mild, moderate, a little, or I don't really know how he did it. I forget how he described it. But I would describe it as a mild toxicity.

Q. Was the information in the Younger testing reports K-26 through K-36 consistent with the opinions you held before you reviewed your reports?

A. Yes, they were.

Q. Let me hand you next a large group of documents, these are marked K-37 through K-77 -- I'm sorry, Exhibits K-37 through K-70. I believe there are 33 reports. Can you identify --

A. Give me time.

Q. Yeah, if you just look through them.

A. K-37 through K-44 are investigations of various PCB's. They were hydraulic fluids and they were carried out by the Scientific Associates, that's another laboratory in St. Louis. Formerly I believe the two heads were either at Younger Laboratory or Younger left Scientific Associates and started his own lab, but they were all the acute tests similar to the ones we described. They also then we go from K-45 all the way down to K-70. These are also the same type tests of functional fluids or

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hydraulic fluids that I presume -- that are PCB's.

Q. And are these, these reports are all acute or toxicity testing in various PCB's products, is that right?

A. Yes, they are. They all are acute testing, some are just limited to oral feedings, some are limited to the battery of the inhalation, eye, skin and oral toxicity.

Q. And are these tests dated between February 19, 1951 through October 19, 1967?

A. That's correct.

Q. Did you request that all these tests be performed?

A. Yes, I did.

Q. And when you received those reports in your medical department did you review them?

A. Yes, I did.

MR. CARNEY: I think we got a signal we have just got a few minutes to go on the tape and change tape.

(Whereupon, a short break was taken.)

Q. Dr. Kelly, that stack of documents I gave you which were Exhibits K-37 through K-70, those reports, those animal reports about PCB's, why did you request that those tests be made?

A. For several reasons. One was we had an ongoing program of trying to fill out the niches in our

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toxicological information about products. We might find that we had done an awful lot of work on 1254 for inhalation.

Q. 1254 meaning what?

A. A PCB for inhalation and found out we never tested it whether it was irritating to the eye or not so we would then run this battery of tests which was the acute screening test. Then there were other Aroclors that we may very well not have had acute testing on.

Q. Again, Aroclors being PCB's?

A. PCB's. And the third was some of these were entirely new ones out of our research department. There were PCB's and some were PCB's in combination with other fluids and we wanted to see if this affected the acute test dose but I would say the primary reason was we were interested in the toxicology of all our products, especially the PCB's and we did quite a bit of work throughout the years on it.

Q. When you reviewed these reports, these three three reports, Exhibits K-37 through K-70, did they change your mind about the safe handling of PCB's?

A. They did not.

Q. Were they consistent with the opinions that you held regarding that?

A. Yes, they were.

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Q. Let me next show you Exhibits K-71 through K-75 and ask you if you can identify those exhibits?

A. These were reports from the Industrial Bio-Test Laboratory to the Monsanto Company dealing with the subacute dermal toxicity of Aroclor 1221 -- these are all PCB's and subacute means someplace between acute and chronic. In other words, I said acute is a real -- you're testing almost the immediate reaction of the body to a product.

The chronic testing is small amount of the product over a period of months or years and subacute falls in the middle, say three months or in the case of skin not quite that much. So anyway it's the testing by skin application of four, three -- five different PCB's run in 1963 for Monsanto Company.

MR. MC CREA: Counsel, what numbers were those?

MR. CARNEY: It's K-71 through K-75.

Q. (By Mr. Carney) Did you request that these tests be performed?

A. Yes, I did.

Q. Why did you choose Industrial Bio-Test to do these tests?

A. Well, they were the preeminent toxicological laboratory in the United States. They were -- Their

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clients included all the large chemical companies, Dow, DuPont, FDA, U.S. Army, everybody. They were very well highly thought of.

Q. Were these five reports, K-71 through K-75 transmitted to you by Industrial Bio-Test?

A. That's correct, they were sent to the medical department.

Q. Did you review those tests on or near the the dates of that respective report?

A. Yes, I did.

Q. Was there any information in those reports that caused you to doubt whether PCB's could be safely used in industry if the safe handling precautions were followed that you recommended?

MR. MC CREA: Again, we'll object on the basis of hearsay and that there is no showing that this report has been peer reviewed.

THE WITNESS: Are you finished?

Q. (By Mr. Carney) Do you remember the question?

A. No. But I didn't know if he was finished with his objection.

MR. MC CREA: Yes.

Q. (By Mr. Carney) Let me just give you again the same objection but repeat the question so it's fresh

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in your mind. Was there any information that was contained in these five reports that caused you to doubt whether the various PCB's tested could be used safely in industry if the basic safe handling precautions were followed?

A. No. There was nothing in there that caused me to doubt or change my mind.

Q. Were they consistent with the opinions that you held at that time?

A. Yes, they were.

Q. Dr. Kelly, let's next look at Exhibits 76 through 81. These are kind of bulky tests, but I'll ask you the same question: Can you identify those exhibits?

A. Yes. These exhibits are reports to the Monsanto Company by the Industrial Bio-Test Laboratory dated November the 1st, 1971. They deal with three PCB studies in rats and in dogs.

Q. And these tests were done in 1970?

A. Well, they ran --

Q. The reports are dated 1970?

A. 1971.

Q. And were these -- how long a period were these tests conducted for?

A. Well, the actual feeding is two years. In a two year test, that's what the name implies. It's two

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years that you feed them, but however you want to get a level that you know will cause some pathology, some harm to the animal, so you can see what's happening. So you want a high level, you want a low level that you hope will not show any problems and you want to get one in between that you would like also not to show any problems, so you might take one part per million, ten parts per million and a hundred parts per million.

So that when you're fiddling around trying to come out with the level that you are going to use on these animals that might take three or four, five months. Then you add that to the two years actual feeding test, then after you get the animals off the feeding test you have to sacrifice the animals and run pathology slides, microscopic examinations of all the tissues.

And that's where the bottleneck comes, that could be three months, six months, nine months, so when you're talking about a two year testing if you get out of it in three years you're very fortunate, so I think these -- we must have authorized it sometime 1968.

Q. And when you said these were two years feeding tests, does that mean these animals were feed PCB's every day?

A. Every day, whether it was five days a week or seven days a week, but --

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Q. Did you request that these studies be performed?

A. Yes.

Q. Why did you request that these longer two year feeding studies of PCB's on animals be done?

A. Well, there was no information in the literature, no information any place on the long term effects of small amounts of -- the effects or lack of effects of long term exposure or absorption of PCB's.

Q. Was it about this time that -- or do you recall when it was discovered that PCB's persisted in the environment or caused an environmental problem of any kind?

A. Late sixties, whether it was '65 or '66, something around that to the best of my impression, best of my knowledge it was discovered in Europe at that time and I think it was discovered in the United States a year later or so.

Q. And just briefly I think I'm going to -- Well, let me cover the environmental question a little later on. Let me talk a minute -- I believe Mr. McCrea mentioned and you I think even mentioned the Yusho incident in Japan. Are you familiar with that?

A. Will I get rid of this?

Q. Yeah.

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A. Yes.

Q. What was that incident?

A. Well, in Japan there was a heat exchange arrangement for cooking or processing rice oil. That heat exchange system is you have a fire out here, you have a closed system with a fluid, a heat exchange fluid in it, it goes into here into the vessel that you want to warm up, or heat up, and that's not supposed to leak, but unfortunately it did leak. So that this material that was hot, which happened to be a Japanese PCB, Kanechlor was the name of it.

Q. It wasn't a Monsanto PCB?

A. It was not. It leaked into this oil, this rice oil. This rice oil was sold in a particular area of Japan and it was used in cooking. I don't exactly know whether they cooked vegetables or soybean cakes or what, but anyway it was used in cooking.

Q. So PCB oil was used in cooking in a certain area of Japan?

A. Inadvertently of course.

Q. Of course.

A. It was in the rice oil, there was rice oil that contained PCB's, and an awful lot of people got sick, a thousand people.

Q. Did they actually then eat the PCB oil, is

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that what happened?

A. Oh, yes, it was absorbed in whatever they were cooking, and it created quite a problem, and an awful lot of investigation carried out by the Japanese. So after a lot of investigation they find out that the process of heating the Japanese PCB's in the heat exchanger followed by heating the contaminated rice oil had caused formation of products called dibenzofurans.

Q. Or for short I think furans?

A. Furans, DBF, or furans, yes.

MR. MC CREA: To which we will object as hearsay.

Q. (By Mr. Carney) Go on, Doctor.

A. So this -- Well, that's what happened, these people developed chloracne, they developed reproductive problems, they had children with bad -- with early changes in their teeth, they had a number of problems.

Q. Was there anything in the -- I take it there was articles written about this Yusho incident in Japan?

A. Oh, yes, Japan, then in the United States, first Japan for quite a few months and after a year or so the articles started to be translated, the articles started coming over and being published in the United States literature.

Q. Do you recall about when the articles were

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published in English about this Yusho incident?

A. Late sixties, I would gather.

Q. You sure about that?

A. No. I'm not sure.

Q. Okay.

A. I mean, I can find it out. It's documented, but I'm not sure off the top of my head.

Q. Because I think Dr. Kimbrough said in her studies that the --

MR. MC CREA: I object to Counsel --

MR. CARNEY: Just a minute. I haven't finished my question.

MR. MC CREA: I'm going to object.

MR. CARNEY: Well, just a minute, as soon as I finish my question you can object as long as you desire.

Q. (By Mr. Carney) The reason I say that about the date when it was published in English is that Dr. Kimbrough in one of her studies said that the Yusho study was published in 1984?

MR. MC CREA: 1984?

A. '84, no. It was long before that.

Q. (By Mr. Carney) Was it?

A. Oh, sure.

MR. MC CREA: I'm going to object to Counsel attempting to coach the witness as to what the answer to

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the question is.

MR. CARNEY: Well, if I attempted to coach him I wasn't very successful.

MR. MC CREA: Either the witness knows or he doesn't know.

THE WITNESS: Well, the witness can find out. It's a very simple matter.

Q. (By Mr. Carney) One of the documents that we looked at was Dr. Kimbrough's article, Exhibit K-7 and just take a look at the last sentence on the first column there. Would you read that into the record?

A. Yes. It said here, "The outbreak occurred in 1968, and the second outbreak occurred in Taiwan in '79. The outbreak in Taiwan repeated what had occurred ten years earlier in Japan. Many studies of these outbreaks have been published in Japanese and Chinese. In 1984 some of these information in these reports were published in English in the American Journal of Industrial Hygiene and Medicine." Well, they devoted a whole issue to it, but I don't believe that was the first information in the English literature.

Q. Okay, at any rate did you review the literature that was published about the Yusho incident and then later on Taiwan?

A. Yes, I did.

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Q. Where the people ate PCB's?

A. That's correct.

Q. And was there any information about the cause of the problems the people had when they -- as to the reason the people had the problems they had when they ate the PCB's?

MR. MC CREA: To which I will object unless Dr. Kelly is able to identify the articles, date of publication and author with respect to the question addressed to him; because otherwise it would again be impossible to cross-examine the witness. He has stated that he has reviewed the literature, so I would assume it's not too difficult for him to do?

THE WITNESS: Well, it's not too difficult for me to get, certainly not. It may be a little difficult for me to give the dates. I could find it out, that's no great problem.

A. But to answer your question, yes, it was decided by the Japanese scientists and written up in the published literature and accepted by all the majority of the scientific thinking that the cause was the presence of furans in the PCB's that caused the problem, and the furans went into the PCB's because of the heating process both in the heat transfer agent as well as the cooking by the housewife.

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MR. MC CREA: Again, for the purpose of clarity, I understand the doctor's testimony; there is no year given, no article. It's simply impossible for us to cross-examine him on this point, understanding that he very well may not be at trial and this is our only opportunity.

Q. (By Mr. Carney) Well, can you recall which article or which approximate year you read this information?

A. No. But I don't have -- I can't tell you directly, but I can very probably have it tomorrow.

Q. Well, we might try to do that. You mentioned that it was the furans in the PCB's that was causing the problems in people that many ate PCB's in Japan and Taiwan, were those quantities of furans in the Monsanto PCB's, were they the same as the furans in the PCB's that these -- Japanese PCB's that these people ate?

MR. MC CREA: To which we'll object for the reason that Counsel has not asked any questions regarding this witness' study of or direct knowledge of the quantities of furans in the PCB's manufactured by Monsanto. Furthermore, Counsel has not asked any questions with regard to the testing of PCB's in a similar situation to that in Yusho and Taiwan which involved heat and therefore there is no foundation information for this

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witness to give a comparison of furans in Monsanto's PCB's compared to furans in the Kanechlor PCB's manufactured in Japan. If he has knowledge of levels of furans, knowledge of tests involving heat and he can specify that, preferably provide the documents then that's the proper foundation.

Q. (By Mr. Carney) Let me withdraw that question for a minute and ask you this, Dr. Kelly: Has there ever been to your knowledge an incident where people had eaten Monsanto PCB's?

A. Not that I know of.

Q. Is there anything in the published literature that you have seen where there was an incident like in Japan or Taiwan where they ate PCB's in large quantities?

MR. MC CREA: Objection, leading. Large quantities?

Q. (By Mr. Carney) Or small quantities.

MR. MC CREA: I have no idea what you're referring to.

A. Well, there are reports of course of PCB being present in fish. There are reports of PCB being present in milk in a tenth of a part per million, 2/10th's of a part per million and the federal government has put out allowable limits of the PCB's, a safe limit of PCB's in milk, milk, which is the sacred cow of the Food and

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Drug Administration.

We know that there are levels in fish in the Great Lakes and in the Mississippi River. There's a small amount, but at no time has there been anything like the amount of PCB's that were in the Japanese Kanechlor after the heating in the heat transfer, the leaking --

Q. The Yusho incident?

A. The Yusho incident, yes.

Q. And is there any comparison with regard to the furan levels in the Japanese PCB's that the people ate in Yusho compared to the Monsanto PCB's?

MR. MC CREA: Again, same objection. First the question needs to be addressed is he familiar with any data, if so, when did he see the data, who produced the data. We're just jumping to a conclusion. There is no information whatsoever that this witness has any knowledge of the furan content of the Monsanto's PCB's, particularly under the circumstances of heating. There's no information.

Q. (By Mr. Carney) Do I need to restate the question?

A. I think you better.

MR. CARNEY: I'll give you the same objection and I'll try to restate it.

Q. (By Mr. Carney) Doctor, is there any

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relationship between the amount of furans found in the Yusho incident and the Japanese PCB's and the Monsanto PCB's?

A. There were enormously higher in the Japanese Yusho incidents; but the PCB's, furans in the PCB's that were used in Yusho by the Japanese housewives contained a much, much, larger quantity of P -- of furans than the Monsanto product in the United States.

Q. What do you mean by much larger?

MR. MC CREA: Same objection.

A. A magnitude of ten to twenty. I could get the figures, I don't have them.

Q. (By Mr. Carney) It's at least that much?

A. Oh, yes.

Q. Did the National Cancer Institute ever do any studies of PCB's to your knowledge?

A. Yes.

Q. Could you describe those?

A. They did a two year testing with PCB Aroclor 1254.

Q. And what were the results of that study?

MR. MC CREA: Objection, unless the document, author and date of publication is identified in order that we may have a meaningful cross examination as to the question.

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Q. (By Mr. Carney) Go ahead.
A. The question again?
Q. What were the results of the National Cancer Institute study on PCB Aroclor 1254 that you mentioned?
A. They said according to the National Cancer Institute as they published in the journal, I believe, of the National Cancer Institute stated that according to the parameters of their experiment, 1254, which is a PCB, could not be a carcinogen to rats.
Q. And I believe we briefly mentioned that Dr. Kimbrough did some two year feeding studies of rats on Aroclor 1260, is that correct?
A. That's correct.
Q. Do you recall approximately when those tests were done?
A. In the first couple of years of 1970 I believe, around that, give or take a year or two.
Q. Early 1970's?
A. Or very late -- Yes, I think early 1970's.
Q. And 1260, is that a high or a low chlorinated PCB?
A. It's high chlorinated, it's chlorinated to 60 percent.
Q. Is that more toxic then than a 1254 Aroclor or something lower than than 1260?

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MR. MC CREA: Objection, again there is no foundation information that this witness has any knowledge with regard to the relative toxicity of Aroclor 1260 compared to any other mixtures manufactured by Monsanto or anyone else.

Q. (By Mr. Carney) Do you recall the question?

A. I just cannot follow you and keep one ear on the other counsel.

Q. (By Mr. Carney) I understand, it's confusing. Can you tell me is Aroclor 1260, can you tell me whether it's more toxic or less toxic and the other PCB's.

MR. MC CREA: Same objection, Counsel?

MR. CARNEY: Same objection.

A. Well, that requires a little bit of explanation. We have been talking about carcinogenesis, we have been talking about ability to cause cancer. 1260, has been shown in animals to cause cancer of the liver, there are various discussions about how much or how little, but anyway the other Aroclors, the other PCB's that are not chlorinated to the extent of 1260 such as 54, 42 have never been shown to cause cancer in animals. When you talk about animals -- if we're talking about humans PCB's have not been shown to cause cancer in any human person.

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Q. Any PCB?

A. Any PCB, period. Now we get down to toxicity, Aroclor 1260 is a higher boiling material, so that if you have them the same temperature you do not get as much of the PCB in the air as you would of 1242, so that from that point of view the lower chlorinated compound is more toxic.

Q. In terms of --

A. But per se by itself, usually when you increase the chlorination you get higher toxicity. The Treon work showed that the 1254 was more toxic than 1242, so 1260 may or may not be, depending on how you view toxicity.

Q. (By Mr. Carney) Well, with regard to --

MR. MC CREA: I didn't get the name, he said the something showed the 12 --

THE WITNESS: Treon, T-r-e-o-n. You have the papers.

MR. MC CREA: Thank you.

Q. (By Mr. Carney) Dr. Kelly, with regard to cancer in animals now you said that the Aroclor 1260 is the only PCB that's been shown to possibly cause cancer in animals, at least in rats?

MR. MC CREA: Object to the leading nature of the question and use of the word possibly. The tests were

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done by Renate Kimbrough, he's described her credibility and reputation evidently with which he agrees; I never heard the word possible.

Q. (By Mr. Carney) Well, Dr. Kelly, Aroclor 1260 is the only PCB you're aware of that might cause cancer in rats?

A. That is correct.

Q. And it's never been shown to cause cancer in humans?

A. That is correct.

Q. And Dr. Kimbrough -- Well, was Aroclor 1260 to your knowledge ever used in capacitors?

A. Never was.

Q. And the tests that Dr. Kimbrough did in the early 1970's what did that show with regard to the Aroclor 1260?

A. It showed that after two year feeding of Aroclor 1260 her animals developed what she claimed to be malignant tumors of the liver. There was quite a discussion about this between people that looked at our slides and people that looked at her slides. We gave her our slides because we had tested 1260 for a period of two years, which was the same as hers and came out with different results.

The upshot was we sent her slides along with ours

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to two different groups, one was a Dr. Pavis Pour, P-o-u-r, at the Aetna Institute of Cancer at the University of Kansas Medical School as well as to Dr. Gordon Richter at the Northwestern University Department of Pathology. They did not agree with Dr. Kimbrough in all her cases. In fact, they did say that some of the cases were malignant but the vast majority that she claimed were not.

I have not talked to Dr. Kimbrough about what she thought about our slides, whether her pathologist thought we had overlooked our slides but we also sent our slides over to Pour and Gordon Richter and they didn't find any cancer in ours. Other workers have found what they believe to be cancers of the liver also working with 1260 outside of Kimbrough.

Q. Dr. Kimbrough did these tests and found some liver cancers in rats in 1973, what was Dr. Kimrough's -- this same doctor's conclusion with regard to the health effects of PCB's on humans.

MR. MC CREA: Just a second, Doctor. I'm going to object for the reason in the question it is not prefaced as to whether or not the opinions of Dr. Kimbrough are based upon standards of scientific certainty or scientific probability. It's not established in the question and it's highly relevant with respect to the

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standards in the court.

A. I think this is getting so technical I would like to read Dr. Kimbrough's statements again from her two papers that I read earlier. This is now the same Dr. Kimbrough that we have been talking about for the last few minutes and she states in her paper in Annals of Review of Pharmacology and Toxicology, 1987 and Mr. McCrea that is on Page 106 and it says, "In conclusion various toxic effects of PCB's have been described in laboratory animals. In humans acute poisoning outbreaks have only occurred following exposure to a combination of PCB's and PCDF's. When humans were exposed only to PCB's they only observed acute effects of general or minor. So far no chronic effects have been causally associated with exposure to PCB's."

Now we turn to her latest paper which is August of 1988 in the Health and Environment Digest. Feature article, that says, "Thus, despite" -- on page 04 -- "Thus despite positive laboratory animal data and except for chloracne exposure to PCB's has led to no convincing clinical demonstrable chronic health effects in humans." And I'm sure as she says up there she would consider cancer a chronic health effect.

Q. (By Mr. Carney) And those two articles you just read from were long after she had found some cancer

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in the livers of laboratory rats?

A. Oh, yes. She found them in '72 or '73. These are 1987 and 1988.

Q. Dr. Kelly, have you known a Dr. von Oettingen?

A. Yes, I do. I have, rather.

Q. And she's a --

A. It's a he.

Q. It's a he?

A. William von Oettingen.

Q. And was he a well known Ph.D. and toxicologist?

A. Yes. I believe he also was an M.D. He certainly was very well-known. He worked for the government a great amount of time. I don't know what work he did in Germany before he came over here. Then went to work with DuPont as head of the Haskell Laboratories of Toxicology. He was also a consultant for various firms.

Q. Let me show you Exhibit 82 and ask if you can identify that?

A. Yes. This is an article, a medical research project No. MR-46, The Toxicity and Potential Dangers of Inerteen, which we referred to earlier, that's the trademark for the transformer fluid of Westinghouse.

Q. PCB?

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A. A PCB, submitted by Dr. von Oettingen, he is both a PhD. and an M.D. from the Haskell Laboratory of Industrial Toxicology at Wilmington, Delaware, and on it it has Westinghouse Electric and Manufacturing Company, East Pittsburgh, PA, Industrial Hygiene Laboratory, file copy. The date of this article or report is 3/28/38.

Q. What's the title of the article?

A. The Toxicity and Potential Dangers of Inerteen.

Q. What type of testing did Dr. von Oettingen do on Inerteen on or before 1938?

A. He fed rats, he --

MR. MC CREA: Objection, unless the testimony is related to the document and not hearsay. I presume it's related to the document.

A. Well, there's no page on this, but it's an Exhibit GBRN 003094, which is is second page following the title page. It has Dr. von Oettingen's name at the top of the page so I would presume it came from his laboratory.

Q. Go ahead, it's in the report then?

A. And it says here he fed it rats.

Q. And --

A. Wait, I want to see what else he did. He also fed trichlorobenzene, which is an ingredient in Westinghouse's transformer fluid. Then he applied the

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material Inerteen to the skin of rats of -- Yes, still rats. Then he had vapor, acute vapor studies at elevated temperatures, also rats.

MR. MC CREA: Doctor, if you can, could you give us just the last two digits on the page, the dates?

A. Well, the inhalation was 3101 of vapors, skin application was 3100, the trichlorobenzene was 3098.

Q. (By Mr. Carney) Doctor, does he outline or recommend minimal -- a maximum allowable air concentrations of Inerteen in the work place and I'll direct you to page 3106, and does he respond to that in his report?

A. I'll have to read it.

MR. MC CREA: What page?

A. 3106. He says, "Repeated inhalation for short periods of five milligrams of Inerteen vapors per liter per air," that's pretty big, that's five grams per cubic meter, "or repeated inhalation for eight hours of 0.05 or 0.09 per liter of air caused no definite injuries to the rats. He also says on Page 3107 he said, "From the animal experiments reported it appears that low concentrations, below 0.05 milligrams per liter of air will cause no toxic signs or symptoms even with continued exposure.

Then he goes on to say, "Regarding preventive

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measures the following may be suggested. It appears to be of paramount importance that contamination of air be reduced to concentrations below .05 milligrams per liter by adequate forced ventilation at the site of the production of vapors. Greatest personal hygiene is no less important."

Q. (By Mr. Carney) Does he say to avoid skin contamination?

A. Yes. He said -- Now that's the personal hygiene, of course, contamination of skin should be avoided by wearing proper protective garments such as gloves, caps, overalls, skin should be kept clean.

Q. Dr. Kelly, did Westinghouse have a medical director during the time that you were the Monsanto medical director?

A. Oh, they had one who was -- he was a tower in the industrial medical field, Dr. T. Lyle Hazlett. He was one of the original pioneers, he was a very well-known person.

Q. To your knowledge did Westinghouse have knowledge on the subject of toxicity and safe handling precautions for Inerteen the Westinghouse PCB?

MR. MC CREA: To which I will object. There is no showing that this witness has any personal knowledge of what Westinghouse knew. It would be pure speculation

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at this point.

A. Yes, they did. I have talked to Hazlett about it.

MR. MC CREA: And for the further reason that this is hearsay.

Q. (By Mr. Carney) What did you talk to him about.

MR. MC CREA: Just a second, Dr. Kelly. We object to this for the reason that this is hearsay, Dr. Hazlett is not here to be cross-examined as to the conversation and it is again literally impossible for the plaintiffs to the contend with hearsay information, i.e., to cross-examine.

A. Well, I talked to him in general about PCB's and he was extremely knowledgeable about it, he knew more than I did.

Q. Did --

A. In addition we've sent material to their industrial hygienists.

MR. MC CREA: Not responsive, and object to the volunteer information.

Q. (By Mr. Carney) Did Monsanto -- How did they make the Inerteen for Westinghouse?

A. Well, they made the PCB's at East St. Louis or at Anniston and then added the trichlorobenzene at

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presumably East St. Louis. I don't believe they added at Anniston.

Q. Whose specifications were they for the making of Inerteen PCB's?

A. Westinghouse.

Q. Was Westinghouse a large company?

A. Was and is. Second largest electrical company in the United States.

Q. Do you know -- Well, I think you indicated that Westinghouse employed industrial hygienists?

A. That is correct.

Q. Did you know any of the industrial hygienists?

A. Yes, I knew Speicher.

Q. Did you know him to be someone respected in the area as an industrial hygienist?

A. Yes, he came from one of the states, I don't know if it was Ohio or if it was one of the major manufacturing states, before he went to Westinghouse he was a well-known, respected industrial hygienist.

Q. Did you have any discussions with him telling him about PCB's.

MR. MC CREA: Again plaintiffs object on the basis of hearsay?

A. I don't recall if I did. That discussion

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would probably have been carried out by our industrial hygienist himself.

Q. (By Mr. Carney) Do you have knowledge as to Speicher's knowledge with regard to the Inerteen or PCB's?

MR. MC CREA: Again, this is beyond hearsay with absolutely no way to pinpoint the source of the knowledge, it could be hearsay three or four times removed, who knows?

A. I have seen communications from members of our department to Dr. Speicher, I've seen the carbon copies of them.

Q. (By Mr. Carney) Indicating what?

A. Indicating --

MR. MC CREA: Again, just a second please, Doctor. The document is not in the evidence, we don't know the date, we don't know what's in the document. He's going to describe something which we can't possibly cross-examine, there's no identification of the document.

Q. (By Mr. Carney) Well, let's get to the documents. Take a look at Exhibit 83. I'll ask you if you can identify Exhibit 83?

A. This is a document written by Elmer P. Wheeler, who is an assistant director of the medical department of Monsanto Company whom I hired, whom I know and even though Monsanto Company does not show up on this

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particular paper I know it came in Monsanto, because I know Mr. Wheeler worked there, having hired him. It was dated October the 23rd, 1959 to Mr. Speicher in which he explains --

MR. MC CREA: Can I interpose an objection? Excuse me, Doctor. He knows that Dr. Wheeler worked for Monsanto, but there is no showing that he has seen this document, he saw this document --

MR. CARNEY: Just a minute. Let me ask him the question, that will clarify it.

Q. (By Mr. Carney) Was this Exhibit 83 a letter that was sent to Westinghouse on or about October 23, 1959?

A. Yes, it was.

Q. I notice it doesn't have a signature. Would that indicate anything to you?

A. Well, nobody that I know of in business ever signs a carbon copy. These are the file copies.

Q. This is a copy of the letter that was sent to Dr. Speicher by Dr. Wheeler?

A. That's correct.

Q. And would you -- What information did Mr. Wheeler at Monsanto give to Mr. Speicher, the industrial hygienist to Westinghouse in this letter of 1959?

Q. (By Mr. McCrea) Excuse me, Dr. Kelly. The

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document has not been authenticated, it has not been identified as Monsanto document. It is granted that there's a date on the document and there are names on the document but it's not been identified as one having been sent to Speicher. Other than the information on it there is no -- this witness has no personal knowledge of this having been sent to Speicher.

MR. CARNEY: Well, he just testified that it was sent, and that he knows it was sent and it shows it was from Dr. Wheeler, Assistant Director of the Medical Department.

Q. (By Mr. Carney) Was Dr. Wheeler in October --

A. Mr. Wheeler.

Q. I'm sorry, Mr. Wheeler in October of 1959 the Assistant Director of the Medical Department at Monsanto?

A. That's correct.

Q. Was he the Assistant Director of the Medical Department in any other company or organization to your knowledge?

A. No.

MR. MC CREA: There's been no testimony that he knows the document was sent?

A. Ask it.

MR. CARNEY: Well, I already asked so I won't

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ask it again so I wouldn't repeat anything. Let me go on.

Q. (By Mr. Carney) Dr. Kelly, can you tell me what was pointed out to -- by Mr. Wheeler at Monsanto to Mr. Speicher, the industrial hygienist at Westinghouse in this October 1959 letter.

MR. MC CREA: Objection, no authentication.

A. Repeat please?

Q. (By Mr. Carney) Can you tell the jury what Mr. Wheeler pointed out to the Westinghouse industrial hygienist, Mr. Speicher, in October of 1959 in this letter that's marked K-83?

A. Yes. He -- first of all he told him that, told him what was in the Westinghouse product. I would imagine that Mr. Speicher would know what was in his own product, but anyway we told him. We then gave the physical and chemical properties of Aroclors, the PCB's, they were in pages four and five in the enclosed Aroclor bulletin.

Then we sent him a reprinted bulletin including the results of chronic toxicity studies with Aroclor 1254 and 1242, both of which have been submitted as exhibits in this deposition. Then it appears that there was some questions that Mr. Speicher wanted to ask, so we said we believe that prolonged repeated skin contact with any of the Aroclors should be avoided for two reasons.

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Q. Again Aroclors being PCB's?

A. That's right, he explained -- You want me to read the whole thing, it's three pages.

Q. Well, no. I don't think we need to read it all. Let me point out a couple things. Read the third paragraph, third sentence in that last paragraph on Page 1, starts out "Secondly."

A. Who?

Q. Read the third sentence?

A. "Secondly it is possible that prolonged or repeated skin contact could lead to chloracne."

Q. Go on?

A. "I know of only two cases where such experience is developed during the long history of production and use of the Aroclors. In one case the Aroclors has been used as a heat transfer medium in a system that allowed vapors to escape where the material was heated to 600 degrees F." Go on?

"Second case of mild acne about which we have any knowledge resulted from workmen dipping their hands in Aroclor as if it it were mineral or vegetable oil. In addition the clothing sooner or later being impregnated with the material and the exposure was magnified."

Q. Okay, I don't think we need to go through the whole letter. Why don't you read the last paragraph from

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page 2 or page 3.

MR. MC CREA: I'm going to object to reading the document. Document speaks for itself, there's just no showing that the author of the document, who is not even a Ph.D. or a doctor had any basis for the information contained in the document. It is hearsay from the standpoint that there is no way to determine the validity of this information.

Q. (By Mr. Carney) Go ahead.

A. Want me to read the last page?

Q. Yeah.

A. "I've been told that your company has some twenty-five, twenty-five years experience with the products discussed above, it was suggested that Mr. James B. Ford, manager of transformer manufacturing engineering at your Sharon plant could be a source of information regarding experience with Inerteen PPO."

"Similarly Mr. R.B. Marbury of the Bloomington, Indiana plant has been associated with the use of Aroclor 1242. Perhaps you've already discussed potential exposure with these two gentlemen. If so I'd be interested in learning of their practical experience with these products."

Q. And then read the final sentence?

A. "I look forward to seeing you in Pittsburgh

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next week."

Q. Let's take a look at Exhibit K-85, ask you if you can identify that document?

A. This is a document -- What is that last document? This was a document dated February the 12th, 1969. It appears we had a reorganization of titles of medical appointment and Mr. Wheeler was called Manager, Environmental Health, Medical Department. It's a letter by him, dated February 12, '69 to a Dr. or Mr. -- I'm not sure, Senior Bindschaegler, safety -- probably Dr., Safety Administrator, Westinghouse Electric Company, Pittsburgh, Pennsylvania 15325. "Dr. Bindschaegler --

MR. MC CREA: I'm going to object to this document.

Q. (By Mr. Carney) Let me just, let him finish identifying it?

A. Yes, this is a letter from Mr. Wheeler to Dr. Bindschaegler.

Q. Was this a letter that was sent by Monsanto to Dr. Bindschaegler at Westinghouse?

A. Yes, it was.

Q. On or about February 12, 1969?

A. Yes, it was.

MR. MC CREA: I'll object. There's no showing that the witness has personal knowledge that this

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letter was sent or received or any circumstances surrounding the letter including any sources referenced. It's hearsay.

Q. (By Mr. Carney) And again, Dr. Wheeler was in your --

A. Mr. Wheeler.

Q. I'm sorry, Mr. Elmer Wheeler was in your department at the time this letter was sent?

A. That's correct.

A. Mr. Bindschaegler was the safety director at Monsanto in the the general office at the same time.

Q. And what is the substance of Dr. -- I'm sorry, of Mr. Wheeler of Monsanto's letter to Westinghouse in February of 1969?

MR. MC CREA: Objection, no authentication.

A. He is talking about chlorinated diphenyl, a PCB, as a heat transfer agent. That would be Aroclor 1254. He enclosed the Hygienic Guide Series published by the American Industrial Hygiene Association, which discussed the toxicity and safe handling of this class of compounds. And there's a report of reprinted animal toxicity in two of the chlorinated biphenyls.

He also sent the medical department a statement summarizing the toxicity and safe handling of Therminol fluids. He gave the threshold limit for PCB chlorinated

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to 54 percent .5 milligrams per cubic meter of air, and he also stated, this last paragraph, "I am sure you know that your company has many years of experience in handling and using chlorinated biphenyls as electric transformer fluids --"

Q. Chlorinated biphenyls being PCB's?

A. PCB's. "It is possible your experience is wider than ours in terms of exposure levels in a users' plants as compared to our manufacturing facilities."

MR. CARNEY: I've gotten the signal our tape is about to run out, so why don't we take a brief break.

(Whereupon, a short break was taken.)

Q. (By Mr. Carney) Dr. Kelly, let me hand you Exhibit K-86 and ask you if you can identify that document?

A. This is a document by Mr. Elmer Wheeler, Manager of Environmental Health of Monsanto to Mr. Speicher, headquarters, Industrial hygiene, Westinghouse Electric Company, East Pittsburgh, P.A.

Q. Was this a letter sent from Monsanto to Dr. -- or to Mr. Speicher at Westinghouse on or about March 5, 1969?

A. Yes, it was.

Q. And that's a copy of the letter that was sent?

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A. That is correct.

Q. Is -- what is Mr. Wheeler of Monsanto doing or sending in that letter?

A. What's he doing? He's sending two copies, obviously in the second paragraph he talked on the phone earlier to Mr. Speicher, appears that Mr. Speicher wanted two copies of a publication on Dr. Treon's work so he sent it to him. I don't know, I have no comment or know nothing about what is written in the third paragraph.

Q. Let me show you Exhibit 87, K-87. Can you identify that document?

A. This is a document by Elmer Wheeler to a Dr. Sloat, Manager of Materials, Transformer Division, Westinghouse Electric in Sharon, Pennsylvania, dated April 28th, 1970, and it appears he sent him a copy of the status of the animal toxicity studies with PCB's. He states, "That you recall I gave a copy of this status to each of your two associates but he didn't have available a third copy when you were here," so it appears that there were three people from Westinghouse seeing Mr. Wheeler in April of '70.

Q. And three people from Westinghouse got these PCB animal toxicity --

A. Two of them got it and then Sloat got his by mail. Looks like two of them carried it away.

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Q. And it shows a blind copy going to --
A. Papageorge.
Q. Who was he?
A. He was the man involved in the environmental aspects of the PCB. He was a plant manager of the Anniston plant where they manufactured PCB and he was brought up to St. Louis to manage the environmental aspects of PCB. For a long time Wheeler was doing it, and I finally said, "Look, Wheeler's got other jobs. Get one of your own people to do all this work."
Q. And was this a letter, K-87, that was sent to Westinghouse on or about April 28th, 1970?
A. That's correct.
Q. Dr. Kelly, if the Westinghouse workers at Bloomington had followed the safe handling instructions provided by Monsanto in the bulletins and labels and correspondence that we just discussed, in your opinion to a reasonable degree of medical certainty could the various PCB products utilized by those Westinghouse workers at Bloomington be used without ill effects?
A. Yes. They could be used without ill effects.
Q. Would the same be true of the workers at the Muncie Westinghouse plant at Muncie, Indiana Westinghouse plant?
A. Wherever they use PCB's if they followed

LEXOLDMON001742

those instructions that we had as far as safe handling conditions -- procedures rather, they could, could be used very safely.

Q. Dr. Kelly, were the various medical and scientific articles related to toxicity and safe handling of PCB's which we have discussed such as the Smith article, the Drinker articles and the Treon article in 1956 were they readily available in the public domain to companies like Westinghouse or anyone else that carried out research about PCB's?

A. Oh, yes.

Q. In the case of the doctor -- in the case of the Treon studies those were actually sent by Monsanto to Westinghouse?

A. Yes, but they were published long before that.

Q. Doctor, I'd like to now turn for just a few minutes and I'm getting close to the end, to the discovery of PCB's in the environment, I think you said that occurred late 1966 or early 1967?

A. That's correct.

Q. Was that -- Did Monsanto learn about that at that time, in that time period?

A. Well, they learned about it first in the newspapers, in either the newspapers in the United Kingdom

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in England or in the continent of Europe and --

Q. When we say that the PCB's were first found in the environment in late 1966 or early 1967 what do you mean by PCB's were found in the environment?

A. Well, they found it in feathers of birds, they found it in the bottom of rivers, they found it in soil. You must remember that about that time there were advances in analytical chemistry being carried out that allowed people to find traces of chemicals where they were unable to find it before, down to parts per million, later on parts per billion, and now parts per trillion, so they had independent researchers on their own were interested. Why they were, they were looking for DDT as I remember and they found this material, it was very close to DDT, DDT as you remember was an insecticide that was used very widely --

Q. I don't want to get off on DDT, but when you say that the PCB's persisted in the environment, what does that mean?

A. It was not eaten up by the bacteria in the soil and the water.

Q. So I think other people have said it doesn't biodegrade, is that the term you used?

A. That's correct, but I want to keep it scientific.

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Q. I appreciate you're doing it.

A. That's what biodegrade means, the bacteria eat it up.

Q. And how did -- I think you told me how Monsanto discovered that. Who first discovered this problem where PCB's didn't get eaten up by bacteria but actually stayed in the environment?

A. I think it was Jensen and -- J-e-n-s-e-n and Widmark, W-i-d-m-a-r-k, two scientists in Sweden.

Q. Was it clear at the outset when these two Swedish scientists reported this that they were correct?

A. Well, that again depends on who you were talking to. I mean, they believe this is what they had, although I'm not sure whether they decided this wasn't DDT, this was PCB's. At first we thought that they were confusing PCB's with DDT.

I'm not an analytical chemist so I don't know how hard it is to differentiate between these two things, but afterwards, after they communicated with our scientists in our London office, and one of them, a Dr. Wood, I believe, went over there, but eventually three people from St. Louis went over to talk to Jensen. I don't believe he was there, they talked to Widmark, and there was a chief of our analytical chemistry department, there was Wheeler and it may have been Papageorge, I don't know who the third

LEXOLDMON001745

one was, and Dr. Keller, K-e-l-l-e-r. They went over there.

Q. They went over to talk about these reports?

A. Yes, to talk to them about it, they wanted to get information, but they became convinced, yes, this probably is PCB's.

Q. Were PCB's then found in the environment of the United States later on?

A. Yes, the next one was a Riceburrough out at one of the California universities, he found it out there. I don't know where he found it first.

Q. Was that at the same time that the Swedish people found the PCB's?

A. I think it was some months later.

Q. What was Monsanto's reaction when they were convinced that PCB's were staying in the environment and weren't disappearing?

MR. MC CREA: Objection, unless it's stated as to time when they were convinced.

Q. (By Mr. Carney) Well, when did -- maybe I better make that clear, approximately when did Monsanto become convinced that PCB's in fact were persisting in the environment?

A. Sometime in '67 or '68, I'm not -- give or take six months. I'm not sure of the exact time.

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Q. And at that point in time what did Monsanto do?

A. Well, we decided we don't want to add any more to the environment, because at that same time --

Q. Any more PCB's?

A. PCB's to the environment, right about that same time the phenomenon of biomagnification came up. Now I have to be a little scientific on this. This means that here we have this PCB that was lying down at the bottom of a body of water. We thought it would lie there like a lump of coal and stay there for all eternity without changing even though it was non-biodegradeable; but then we found out that the very microscopic organisms in the bottom of the sediment of this watery area would eat the PCB's.

Well, they would eat them, they wouldn't break it up. It would stay in their body and then the larger marine animals like shrimp would eat these plankton and it would go into the shrimp, and from then the fish would eat the shrimp and it would go into the fish and the amount would increase as it moved up that particular food chain. Then along would come the falcons and eat the fish and the fish and the falcons would get poisoning from the PCB's. The poisoning was a very unique type because it had something to do with the calcium metabolism of the

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eggshell.

Now that was an important obviously for birds but not people, because people do not lay eggs with shells on them. This was very serious as far as these fish eating birds were concerned, because they would lay eggs with no shells and wipe out a species, so we were very concerned about the effect on the environment. So the first thing Monsanto did was let's see what we can do to cut down putting anymore in there.

Q. And what did Monsanto do in that regard?

A. Well, first they wrote to all our customers and told them about being very cautious about eliminating, about not just throwing the stuff out. Remember, now we're talking about the 1960's, we were not as environmentally conscious as we are in 1990 or in the last five years, so people would discard used material --

Q. Used PCB material?

A. Used PCB material, yes. So we warned our customers not to discard material that would get into the environment, not to discard our PCB's, whether they were used as hydraulic fluid or transformer fluid or whatever. Then we decided to cut down the sales to all open operations. By that, open operations, I would mean it was -- It is meant that you cut it down, you don't use it in a plasticizer, you don't use it in carbonless carbon

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paper, which is discarded, you don't use it in paint. Now there are other uses for it, I'm sure, but that's what we decided to do.

Q. One thing you mentioned in your answer a little while ago you were talking about PCB as a poison. What do you mean by that?

A. Well, it certainly was a poison to these birds if they laid eggs without any shells on it.

Q. Or would you characterize most industrial chemicals as poisons?

MR. MC CREA: Again, there is no --

Q. (By Mr. Carney) And by that I mean if you give enough of the product to somebody it can harm them.

MR. MC CREA: Again there is no information that there is any comparable chemical in the environment that has caused this particular reproductive problem as has been described with the falcons. Plus there is no showing that the doctor has relative -- has knowledge of the relative toxicities of other chemicals.

A. Question please?

Q. (By Mr. Carney) Yeah, you referred to PCB's as a poison. Can you tell me in what context --

A. Well, I referred to it as a poison to these birds. I didn't refer to as a general poison such as carbolic acid or something. Maybe I used the wrong term.

LEXOLDMON001749

It was quite toxic for these birds in as much as it disturbed their egg laying, not their laying, egg-laying ability but their bringing up chicks. They'd sit on the eggs without the eggshells and it was goodbye eggs.

Q. You were interrupted, I think you were talking about what Monsanto did when they found out the PCB's were in the environment and possibly harming the animals?

A. Yes, it was an ongoing program, we advised our customers how to dispose of the material safely, we advised our customers that we were not going to sell it for what we considered operations that were not closed. We eventually eliminated all uses except the electrical uses. We wanted to -- we were not -- we were asked --

Q. Why did you eliminate, you said you eliminated all uses of PCB's except electrical uses, why did you continue to use PCB's in electrical uses?

A. For two reasons, electrical uses are rather closed, certainly transformers, capacitors may not be closed because sometime capacitors are discarded but the government told us --

MR. MC CREA: Objection, hearsay.

A. The government told Monsanto don't -- continue manufacturing this material.

Q. (By Mr. Carney) Don't continue?

LEXOLDMON001750

A. Continue, don't stop it, continue manufacturing PCB's of an electrical grade.

Q. Why did the government tell you to continue manufacturing PCB's for the electrical uses knowing that PCB's were staying in the environment?

MR. MC CREA: Objection, hearsay, no identification, author, date, publication; it's absolute hearsay.

A. Because there was no substitute product at that time that was non-inflammable. It was important these transformers were in areas where it was absolutely, where safety was absolutely important and the government told us to keep on manufacturing it. Eventually we said we were going to stop completely because it was our impression that there were on the -- there were available products which were non-inflammable, they may not have been as good from the dielectric point of view but they could be used, and I believe Monsanto stopped it two years before the government banned it's use.

Q. So the government stopped manufacturing PCB's all together two years before the government --

A. Monsanto stopped.

Q. Okay.

A. Approximately two years. I don't know if it's two years or eighteen months or something before the

LEXOLDMON001751

government banned it.

Q. Did you attend any of these meetings of Monsanto's top management where they discussed reactions Monsanto would take when they found out about the environmental problems?

A. Yes. I attended two full-blown meetings with them.

Q. And what was said in these meetings?

MR. MC CREA: Objection, hearsay, no identification of date, people in attendance, obviously if these meetings were important there would be records which would be the best evidence and impossible again to cross-examine.

Q. (By Mr. Carney) Can you tell me when these meetings occurred, approximately?

A. The early mid-seventies.

Q. And let me ask you this: You indicated that Monsanto decided on its own to stop selling PCB's except in the electrical areas where the government told them they couldn't stop; was -- Did Monsanto make that decision on its own or did someone tell it to stop in these open applications selling PCB's?

A. Made it on their own, Monsanto made that decision themselves.

Q. Why did Monsanto make that decision to stop

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selling an item that I assume they were making a profit on?

A. Well, they didn't want to increase the PCB's in the environment. I mean, they were just as worried about the peregrine falcon and the bald eagle as anybody else and if the situation was going to get into the food chain for people we didn't want to aggravate it. We wanted to stop it as satisfactorily as we could and as soon as we could.

Q. And why did Monsanto stop manufacturing PCB's all together in 1977?

A. Well, we became convinced that there was enough PCB's available to the electrical industry that they could use it until they used a substitute product, products which were made by other people besides Monsanto, it wasn't that we were sitting back waiting till we got a product, because it was a product that was used widely in industry and they found out that this could be used in transformers.

Q. And why did Monsanto at that point then stop making PCB's?

A. Well, we knew there was still the opportunity for material to get into the environment out of discarded capacitors. We knew that there were going to be transformers being put out of service, we knew that we

LEXOLDMON001753

didn't want to continue having this possibility of increasing the PCB in the environment so we stopped it completely.

Q. I don't think I have any further questions at this time, Dr. Kelly.

MR. MC CREA: Would this be good place to break?

MR. CARNEY: Well, I think we might want to get started -- We've got about a half hour left on the tape. If you want to just get a start we can obviously I don't think --

MR. MC CREA: How are you holding up, Dr. Kelly?

THE WITNESS: Fine. How about yourself?

MR. MC CREA: Well, I think you're doing better than both of us put together perhaps.

THE WITNESS: Well, you have been arguing back and forth so much.

MR. MC CREA: We wanted to entertain you.

CROSS-EXAMINATION

QUESTIONS BY MR. MC CREA:

Q. Dr. Kelly, are you receiving a fee for your services provided for Monsanto in this case?

A. Yes, I am.

Q. What is your fee?

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A. It varies. It's an hourly fee, from a 125 to $150 an hour.

Q. And what is your arrangement with Monsanto in regard to your fee?

A. I send them a bill and they pay me.

Q. How many billable hours do you have in this case?

A. Eight to ten, I presume. Not counting today. I don't know how long today is going to go.

Q. Have you agreed to serve for them, have you agreed to testify for Monsanto as an expert witness in this case?

A. I agreed to testify as an expert witness, not for Monsanto, not for anybody else. I'm testifying as an expert witness.

Q. Are you also testifying as a fact witness?

A. I will also testify to any facts that I am knowledgeable about, yes, sir.

Q. Are you being paid for your testimony as a fact witness, the same as your testimony as an expert witness?

A. No. I believe I am not -- and most of my information will be as an expert witness. I do not know what the rate of a fact witness is in Missouri, but I believe it's twenty-five or thirty dollars an hour, I

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don't believe that's the rate I'm going to charge Monsanto.

Q. But you have testified as to facts in this case, have you not?

A. Remember.

Q. And do you bill them $25 an hour for that time?

A. No, I do not.

Q. So you don't separate and distinguish between expert testimony and fact testimony?

A. Not in this case, no.

Q. In any other case have you separated the two out, expert testimony and fact testimony?

A. I have testified just as a fact witness in cases and I have testified just as an expert witness where both -- where I testified as both, where both facts and expert opinion is needed, I will testify as an expert witness.

Q. And charge expert witness fees?

A. That's correct.

Q. In this instance if I called you up on the weekend would you talk to me about this case?

A. No.

MR. CARNEY: I'm going to object to that. I don't think your hypothetical, I don't think you've tried

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to call.

Q. (By Mr. McCrea) If I asked to talk to you in the hallway about facts relating to Monsanto's manufacture of PCB's, would you talk to me?

A. No, I would not.

Q. Why not?

A. Because I think that should go at a deposition or go through the lawyers. I don't -- Why would you want to talk to me outside this particular arena?

MR. CARNEY: You're getting your chance, Mr. McCrea, to --

Q. (By Mr. McCrea) Well, have you been instructed not to talk to attorneys for plaintiffs?

A. No.

Q. Have you testified in depositions in which Monsanto has been a defendant in a case filed by plaintiffs alleging environmental damage or personal injury caused by PCB's?

A. That's two questions.

Q. Correct.

A. Will you give me one at time?

Q. First, have you testified in cases for Monsanto as an expert fact witness in which the plaintiffs are claiming environmental damage caused by PCB's?

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A. I've given depositions. I am trying to think if I've been in a trial as far as environmental damage is concerned.

Q. Can you identify for me the cases in which you have given a deposition in which a plaintiff is asking for damages, for PCB damage to the environment?

A. I remember two offhand. One is the Stroh Die Casting Company.

Q. How do you spell that?

A. S-t-r-o-h, I believe, just like the beer, and the second is the Outboard Marine.

Q. Where is Stroh Die Casting located, city and state?

A. The deposition took here in St. Louis. I thought it was in Wisconsin someplace, but I'm not certain.

Q. And Outboard Marine is in Illinois?

A. Oh, no, it's in either Michigan or Wisconsin, some place in the Great Lakes, but again the deposition took place in St. Louis.

Q. Was that Waukegan perhaps?

A. I can't answer that.

Q. Did you testify in those cases as an expert fact witness?

MR. CARNEY: An expert?

LEXOLDMON001758

A. You've got two terms.

Q. (By Mr. McCrea) Expert and fact witness, both?

A. Well, I believe I testified as an expert. I mean if facts came in, the facts were asked I answered it truthfully and told them what the facts were.

Q. Do you recall any other cases in which you have given a deposition in which the issue involved PCB damage to the environment?

A. I told you those two. I do not recall off the top of my head whether there have been other ones.

Q. Dr. Kelly, have you testified by way of deposition in cases in which plaintiffs have sued Monsanto for personal injuries and/or death?

A. Yes.

Q. Can you identify those cases for us by the names of the plaintiffs, city, attorneys?

A. Well, there's the Scott case in Beaumont, Texas.

Q. Did you give a deposition in that case?

A. I believe I did. I certainly testified there. You were there, weren't you?

Q. Yes, I was.

A. So was I.

Q. All right. Is that the only case that you

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have testified?

A. No. Are we talking about PCB's now?

Q. We're talking about PCB's.

A. There was one in Bad Axe, Michigan, I don't recall the name of the man.

Q. When was that case?

A. Six years ago, roughly, I don't -- in that ballpark.

Q. Did you testify as expert in that case?

A. Yes, I did.

Q. What was your opinion in that case?

A. Beg your pardon?

Q. What was your opinion in that case as an expert?

A. That there was no injury to the individual.

Q. And did you give that opinion in court?

A. Yes, I did.

Q. What was the result of that trial?

A. The jury said this man has no injury but we are giving him some money because of fear of cancer.

Q. What was the award the jury --

A. I don't know. I don't know. I don't know.

Q. You've testified in those two cases. Have you testified in any others by way of deposition or trial?

A. I have some. I really can't tell you off the

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top of my head, Mr. McCrea. I have testified in more over the past ten years. I don't have it at the ready.

Q. Have you ever made a list of cases in which you have testified?

A. When I'm filling out my income tax but then after I fill out the income tax I throw the list away.

Q. Do you have a list now?

A. I do not.

Q. How many other PCB personal injury cases have you been asked by Monsanto to give testimony?

A. I told you I don't remember how many. I mean, there have been others but I do not have them at the top of my head right now, I don't have them.

MR. MC CREA: Do you have a list?

MR. CARNEY: I don't have a list.

Q. (By Mr. McCrea) Have you been asked to testify in cases involving other chemicals manufactured by Monsanto?

A. Yes, I have.

Q. What other chemicals have been involved in litigation involving personal injury?

A. 2,4,5-T.

Q. Is that a dioxin?

A. It's an agricultural chemical which may have dioxin in it.

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Q. Do you consider yourself an expert in the toxicological effects of dioxin?
A. I think so.
Q. Were you asked to render an opinion in that case?
A. Yes.
Q. What was your opinion?
A. My opinion was that these people had chloracne, some had had peripheral neuritis in the past but at the present time they had no residue with the exception of the chloracne.
Q. Who was the lawyer for the plaintiffs?
A. For the plaintiffs?
Q. Right.
A. That I don't remember.
Q. What was the result of that trial?
MR. CARNEY: I'll object to the --
A. The plaintiffs lost.
Q. (By Mr. McCrea) The plaintiffs lost?
A. That's correct.
Q. Do you know where that was tried?
A. Charleston, West Virginia.
Q. Have you testified in other cases involving other chemicals manufactured by Monsanto in which plaintiffs have claimed personal injury?

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A. I think I have, but I don't remember the names. It comes and goes. Some years I have two or three cases. Some years I have no cases, so I really don't remember. I know that I left of company in 1974 and that's sixteen years ago. I'm sure I have testified or given depositions in more than the four or five I have given you, but I just don't recall the names.

Q. Have you testified in any cases involving benzene?

A. Yes, I have.

Q. Does Monsanto manufacture benzene?

A. No, they do not.

Q. Did they at one time?

A. They used a great deal of it. I don't know if they manufactured it from a stream, coming from a hydrocarbon stream at their Texas locations.

Q. Were you asked to render an opinion in that case?

A. Yes.

Q. Involving benzene?

A. Yes.

Q. What was your opinion?

A. My opinion was that it depended on the exposure. Benzene is obviously is accepted as an agent that causes leukemia, but it all depends on how much

LEXOLDMON001763

exposure the person has.

Q. How long has it been known to you that benzene is obviously a chemical that causes leukemia dependent on the exposure?

A. Ten or fifteen years.

Q. What was the result of that trial?

A. That was a verdict for the plaintiff.

Q. What was the amount?

A. It was rather exorbitant --

MR. CARNEY: I'm going to object to that as being totally irrelevant to this lawsuit.

THE WITNESS: Do I answer?

MR. CARNEY: You can answer. The court will rule later.

A. It's only hearsay you realize.

MR. CARNEY: Well, apparently he wants hearsay now.

MR. MC CREA: The fact that you were there is hearsay?

A. No. The verdict was hearsay. I was not there when the verdict was rendered.

Q. (By Mr. McCrea) What was the verdict? How much?

A. The verdict was for the plaintiff.

Q. How much?

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A. A hundred thousand -- a hundred million dollars; which was thrown out by the judge, I have to add that.

Q. Have you testified in any other cases involving chemicals manufactured by Monsanto in which personal injury has been claimed?

A. Gave a deposition fifteen years ago on some wax that was used for dentures or something. I don't know much of the details, but it wasn't a PCB and I don't know the result of it. It was a relatively small case and I don't recall much of the details but I did testify on that. There are probably some others that I will think of but I probably testified in a pentachloraphenol up in Chicago.

Q. And who were the plaintiffs there?

A. I think there were -- I don't know who they were.

Q. Is pentachloraphenol toxic?

A. What?

Q. Is pentachloraphenol toxic?

A. Certainly. It's a wood preservative, it's supposed to kill termites.

Q. And what are the health effects caused by pentachloraphenol?

A. You can have chloracne, you can have

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peripheral neuritis, you can have death.

Q. How long have you known that?

A. Thirty years.

Q. What was the results of that case involving pentachloraphenol?

A. The plaintiff lost.

Q. Do you recall any other chemicals manufactured by Monsanto in which you have served as a witness?

A. I don't, but they may -- I may think of them.

Q. We may come back to that. You mentioned that you took short courses in industrial medicine; can you give me some more detail as to that?

A. Yes. There would be a course at the University of Michigan for two weeks, there would be also seminars. Some I was a participant in, some I was a listener, also in industrial medicine.

Q. Dr. Kelly, what is it toxicology?

A. Toxicology is the science that deals with the harmfulness or lack of harmfulness of a product.

Q. Have you taken any courses in toxicology through your completion of your medical degree?

A. Mr. McCrea, when I -- during medical school in 1928 to '32 there were no courses in toxicology, tox -- the action of toxic compounds was brought up in the

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general medical course. Following that, following my experience in the City Hospital, the three years at City Hospital where we had all sorts of cases, it's a busy metropolitan hospital where we have all sorts of poisoning cases, self-inflicted or not, we still had no experts in toxicology.

There were no toxicologists, per se, and though the first toxicologists were physicians. So the physicians who started like me in an occupational medicine a long time ago had to do-it-yourself course in toxicology. Our experience was gained not by lectures because there were no courses in toxicology. There was publications, there was actual on-the-job experience with toxicology.

Q. Other than your on-the-job experience relating to the specialty of toxicology do you have any formal training?

A. Not formal, but I hired four toxicologists and watched them and discussed the toxicological matters. Before we had a toxicologist I hired, I did the work myself, engaged in all the details with carrying out, having a tox -- experiments carried out by the various toxicological laboratories. It was ten or twelve years where I was acting as the toxicologist for Monsanto.

Q. And those years would be '36 to --

A. No. It would be '46 to sometime when they

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hired Dr. Hunt which I thought was around 1960, I'm not sure, but --

Q. Did you serve as the toxicologist for Monsanto from '36 to '46, excluding your service in the war time?

A. Well, I didn't serve as a toxicologist, I served as the physician who gave advice on toxicological problems. I was not passing myself off as a toxicologist. I was passing myself off as an internist and an occupational physician who had a wider range of toxicological information than the average internist has.

Q. Do you feel that you are qualified today to render opinions related to the toxicological effects of PCB's?

A. Yes.

Q. And that qualification is based on your on-the-job experience, you're working with the toxicologist and what else?

A. And reviewing the PCB literature for the past fifty years.

Q. Can you explain to us the mechanisms of toxicity involved with PCB's in health effects?

A. No, it is at the enzymatic level which I cannot explain.

Q. Do you know what I mean by mechanisms of

LEXOLDMON001768

toxicity?

A. No, I don't. I cannot read your mind. Do you want to explain it to me?

Q. How the chemical reacts in the body and what it does to the body and how it does it?

A. What's the question?

Q. Do you understand what I mean when I say mechanisms of toxicity?

A. Well, what you are saying is that you want to know how a material reacts in the body and what it does in the body to the various organs, is that correct?

Q. Correct.

A. I understand that.

Q. You stated that PCB's can cause death, is that correct?

A. Yes.

Q. Can you explain to the jury how PCB's can cause death in an individual, the toxic mechanisms involved?

A. Now are we talking about an individual?

Q. Yes.

A. Yes, by acute liver failure.

Q. How long have you known that?

A. Twenty or thirty years.

Q. Are there any other toxicological mechanisms

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involved with PCB's causing death in an individual?

A. Haven't been reported in humans. Are we talking about individuals or human or an animal?

Q. Talking about in humans.

A. I don't recall any mechanisms that have caused death from PCB's. I don't know if there has been any particular increase, any particular pattern in Yusho or Yucheng cases but certainly in a industrial atmosphere there have been no mechanisms that have caused death in people.

Q. Did you ever inform a purchaser of PCB's that PCB's could cause death?

A. No.

Q. When were you board certified in internal medicine?

A. 1955.

Q. Were you board certified in preventive medicine?

A. Yes.

Q. What year was that?

A. Either '55 or '56.

Q. And the same question for occupational medicine?

A. That's a branch of the -- You were certified by the American Board of Preventive Medicine either in

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Public Health, Occupational Medicine or Aerospace.

Q. Have you given any lectures on the toxicological effects of PCB's on individuals?

A. I have discussed at seminars, I have not given formal lectures to medical students or --

Q. Have you given any lectures to Monsanto employees relating to the toxicological effects of PCB's on their health?

A. Yes, I have.

Q. And can you give me the date and the --

A. No. I cannot give you the date. I left Monsanto in 1974, that's sixteen years ago. I gave it sometime ten years before that, and I certainly don't -- cannot recollect the dates I gave lectures to --

Q. Do you have any -- Excuse me.

A. -- lectures to or conducted talks to groups of employees.

Q. Do you have any manuscripts that would describe the content of that lecture?

A. No, I do not have.

Q. Did you give the lecture from manuscripts?

A. No, I gave it from the knowledge that I had of the product.

Q. Have you given any lectures on the toxicological effects of dioxin on individuals?

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A. No, I have not.

Q. Did you have workers who were manufacturing products which contained dioxin?

MR. CARNEY: Well, I'm going to object to this. If I can have a standing objection to the relevancy of dioxin.

THE WITNESS: Do I answer?

MR. CARNEY: Yeah, you can answer.

A. You must remember that before 1974 when I retired the analytical procedures for the determination of dioxin as a contaminant in compounds was extremely hard, was just coming into force. So we manufactured a compound, an agricultural compound that by supposition contained dioxin, yes.

Q. (By Mr. McCrea) When did you first know that Monsanto manufactured a compound which contained dioxin?

A. Probably in the sixties. I'm not so sure. I mean, I would have to be speculating.

Q. Have you given any lectures on the toxicological effects of furans?

A. No, I haven't.

Q. When did you first know that furans were a contaminant of PCB's manufactured by Monsanto?

A. Sometime in 1973 or '74, around there.

Q. And how did you gain that knowledge?

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A. Well, first of all there was informational literature by Dr. Voss of someplace in Europe. He examined some United States, some Monsanto PCB's. He examined some Italian PCB's and he examined some French PCB's. He didn't find any in the Monsanto PCB's. He found it in the French and in the Italian. Well, then I talked to our people later on and they started looking themselves and after their analytical methods became more precise they were able to find varying levels that varied with different batches and that was in as I say sometime in the early seventies.

Q. Did you communicate to purchasers of PCB that Monsanto had determined by analytical methods that furans were in the PCB's and that was determined in the early seventies?

A. Rephrase the question? I don't know.

Q. That's not a very well-phrased question. Did you communicate to purchasers of PCB's that Monsanto determined that furans were in its PCB's in varying amounts as they determined in the early seventies?

A. No. There was no reason to, because we told the people what the toxicity of the PCB was, and the PCB's that we tested also had furans. We did not change the mode of manufacturing of PCB's. So what I told them was the toxicity of the whole product and I didn't have to

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say, "Well, this contributes some, that contributes some."

So you must remember that we tested the PCB's that were being sent out to the company, to our customers. Those contained furans, we didn't know about that until an analytical method was formed, was developed, when we did find out it didn't add or subtract to our toxicity knowledge because we had tested the material that contained the furans and it didn't make any bit of difference to me or to them whether it contained four parts or eight parts per million.

Q. When did you learn that furans were a contributing cause of the Yusho tragedy?

A. When it was written up in the literature. I'm not exactly sure when I said. I thought it was in the late seventies, but I may have to correct myself on that.

Q. Did you --

MR. CARNEY: Dave, according to my watch we're getting pretty close to running out on the next tape, so if you're --

MR. MC CREA: Right, I'm about --

Q. (By Mr. McCrea) Did you upon learning that information communicate to your purchasers that you had this information that furans were the cause of the disease processes in Yusho?

A. No. Why should I? These people over there,

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it was an entirely different product with enormously more furans than we had. We had tested our material that had at furans in it, so the fact that we found out that they had a few parts per million in furans didn't alter my opinion on the toxicity of the product. So why should I tell them when the toxicity was the same whether we knew the furans were there or didn't know they were there?

Q. What was the quantity of furans that was ingested by Japanese which caused their health problems?

A. I think it depends on how much of the rice oil they ate. I'm not -- I can't tell you right here what the percentage of furans were in the rice oil but it all depends on how long the person ate the rice oil was the amount of furans he got.

Q. What quantity of furans was necessary to cause the many health problems you described in grams, ounces, milligrams?

A. I don't believe that it's been quantified.

Q. Have you read any literature on that subject?

A. Yes. I have read literature. I don't have the facts right at my disposal right at the present time.

Q. What's your judgment as an expert witness for Monsanto testifying in this litigation as to the amount of furans which were necessary to cause the multiple health problems in the Japanese?

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A. A lot more than were present in any Monsanto PCB's.

Q. What's your judgment as to the amount of ingestion?

A. I can't quantify that.

Q. Do you have a ballpark figure?

A. No, I don't. I don't want to speculate. I can find it out for you.

Q. What was the amount of PCB's in that was ingested by the Japanese which caused the health problems in the Yusho tragedy?

A. That, the amount of -- the percentage of PCB's, the parts per million.

Q. No, the amounts ingested in ounces, milligram, grams whatever, what was the amount?

A. I'm sure it varied with how much rice oil they used, how much they cooked the material. It varied from individual to individual, they had a thousand people I'm sure they all didn't have the same dose but I'm unable to tell you what the parameters of the dose are.

Q. Do you know what the toxic threshold limits are?

A. No. I don't.

Q. For PCB's?

A. No, I don't.

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Q. Do have a ballpark idea?
A. No. I don't.
Q. Did you have an estimate?
A. No, I don't.
Q. So you don't know of any literature that describes the amount of PCB's ingested by the Japanese in the Yusho tragedy?
A. That's not correct, that's not correct. It's in the literature. I said I do not have it at my fingertips today.
Q. And you have no ballpark figure as to how much was ingested?
A. I still say I do not have the figures at my fingertips today, and I do not have a ballpark figure, that's correct.
Q. Good place to stop.
(Deposition continued.)

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NOTARIAL CERTIFICATE

STATE OF MISSOURI)
)
CITY OF ST. LOUIS)

I, TOD MINNIGERODE, a Certified Shorthand Reporter and a duly commissioned Notary Public within and for the State of Missouri, do hereby certify that pursuant to agreement there came before me at the offices of Communitronics, 1907 S. Kingshighway, St. Louis, Missouri,

R. EMMET KELLY, M.D.,

who was by me first duly sworn to testify to the truth and nothing but the truth of all knowledge touching and concerning the matters in controversy in this cause; that the witness was thereupon examined under oath and said examination was reduced to writing by me; that the deposition is to be continued by agreement of all parties; and that this deposition is a true and correct record of the testimony given by the witness.

I further certify that I am neither attorney nor counsel for nor related nor employed by any of the parties to the action in which this deposition is taken; further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto or financially interested in this action.

IN WITNESS WHEREOF, I have hereunto set my hand and seal on July 12, 1990.

My commission expires June 3, 1991.

_____
[Notary Public]

IN THE CIRCUIT COURT
COUNTY OF ST. LOUIS, MISSOURI

GLENN BROWN, et al,	)	
	)	
Plaintiffs,	)	
	)	
vs.	)	Cause No. 862-00694
	)	
MONSANTO COMPANY,	)	
	)	
Defendant.	)	

Taxed as per statute:

Attn.	$ 85.00
Org & 1 cc	781.20
Jurat	1.00
TOTAL	$ 867.20

For:
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For:
Mr. David McCrea
McCrea & McCrea
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So ordered

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