

Page 1 1 IN THE CIRCUIT COURT OF THE CITY OF ST. LOUIS 2 STATE OF MISSOURI 3 GLENN BROWN, et al., 4 Plaintiffs, 5 -vs- # 862-00694 6 MONSANTO COMPANY, 7 Defendant. 8 9 10 11 12 Volume II 13 DEPOSITION of DR. R. EMMET KELLY 14 On the part of the Defendant 15 June 1, 1990 16 17 18 19 20 21 22 23 WALLER REPORTING, INC. 24 REGISTERED PROFESSIONAL REPORTERS 25 515 Olive Street, Suite 1506 26 St. Louis, Missouri 63101 27 (314) 621-2571 28 29 30 1	Page 3 1 IN THE CIRCUIT COURT OF THE CITY OF ST. LOUIS 2 STATE OF MISSOURI 3 GLENN BROWN, et al., 4 Plaintiffs, 5 -vs- Cause # 862-00694 6 MONSANTO COMPANY, 7 Defendant. 8 DEPOSITION OF WITNESS, produced, sworn and examined 9 on June 1, 1990, between 8:00 a.m. and 6:00 p.m. of that 10 day, at the offices of Communitronics Corporation, 1907 11 South Kingshighway, St. Louis, Missouri, before Sheila C. 12 Irvin, a Notary Public within and for the State of 13 Missouri, in a certain cause now pending in the Circuit 14 Court of the City of St. Louis, State of Missouri, wherein 15 GLENN BROWN, et al. are the Plaintiffs, and MONSANTO 16 COMPANY is the Defendant; on behalf of the Defendant. 17 A P P E A R A N C E S 18 The Plaintiffs were represented by Mr. David S. 19 McCrea of the law firm of McCrea & McCrea 119, South Walnut 20 Street, Bloomington, Indiana 47402. 21 The Defendant was represented by Mr. Thomas M. 22 Carney of the law firm of Husch, Donohue, Cornfeld & 23 Jenkins, 100 North Broadway, St. Louis, Missouri 63102. 24 25 26 27
Page 2 1 IN THE CIRCUIT COURT OF THE CITY OF ST. LOUIS 2 STATE OF MISSOURI 3 GLENN BROWN, et al., 4 Plaintiffs, 5 -vs- Cause # 862-00694 6 MONSANTO COMPANY, 7 Defendant. 8 9 *** 10 I N D E X 11 WITNESS: Page: 12 DR. R. EMMET KELLY 13 Continued Cross Examination by Mr. McCrea. . . . 4 14 15 E X H I B I T S 16 Plaintiff's Deposition Exhibit #1 40 17 Plaintiff's Deposition Exhibit #2. 118 18 19 20 21 22 23 24 25 26 2	Page 4 1 CONTINUED CROSS EXAMINATION 2 QUESTIONS BY MR. McCREA: 3 Q Dr. Kelly, how are you this morning? 4 A I'm fine, thanks. And yourself? 5 Q Pretty good. Thank you. Dr. Kelly, in 6 preparing for this deposition, did you review any 7 documents? 8 A Yes, I did. 9 Q Did you review any documents other than the 10 documents that have been identified as exhibits and which 11 have been displayed to you during direct examination? 12 A No, I have not. 13 Q Were you asked to render an opinion in this 14 case? 15 A About what? 16 Q About anything. 17 A I was asked to -- 18 MR. CARNEY: Let me object to the question. I 19 think it's overbroad and I think he was, what he was asked 20 is on the record and on the videotape. 21 Q (By Mr. McCrea) Maybe I can be more precise. 22 Did the attorneys for Monsanto ask you to provide them with 23 an expert opinion on any subjects relating to PCBs? 24 MR. CARNEY: I'm going to object to that. I 25 don't know what you mean. We asked for various opinions

Page 5 1 that were given. I don't know if you're using the word 2 asked for an expert opinion in some technical term or legal 3 term. This person isn't an attorney. 4 Q (By Mr. McCrea) You may answer. 5 A Will you ask it again? 6 Q Did the attorneys for Monsanto ask you to 7 provide them with an expert opinion on the subject of PCBs? 8 A Yes, they asked me to provide on expert 9 opinion if PCBs could be used safely in the industrial 10 workplace. 11 Q Did they ask you to render any other opinions? 12 A Yes, they asked me if we had any records, 13 either personally or in the, if I had any information from 14 the Medic Alert literature that's serving the presence or 15 absence of any illness due to PCB outside of acute episodes 16 and chloracne. 17 Q Did they ask you for any other opinions? 18 MR. CARNEY: I'm going to object. The 19 opinions or the questions that we asked him were on the 20 record, and I think what you're doing is asking him to 21 summarize all the answers that he gave yesterday during a 22 full day of testimony. I don't see any point in this and 23 it's -- I think you can just refer to those answers that he 24 gave yesterday. That's -- Those are the questions we 25 asked.	Page 7 1 with PCBs. 2 Q Was that the first time, Dr. Kelly, that you 3 have met with the attorneys in this case? 4 MR. CARNEY: You talking about me or anybody 5 in my office? 6 MR. MCCREA: Yes, the attorneys of record in 7 this particular case. 8 A I certainly have not met with Miss Rutter 9 before, and I honestly don't remember if I saw Mr. Carney 10 in any other cases. 11 Q (By Mr. McCrea) Were there any videotapes of 12 a question and answer session in preparing for this 13 deposition which you reviewed? 14 A No. 15 Q Dr. Kelly, yesterday I asked you about testing 16 which Monsanto did regarding the presence of furans in 17 PCBs. Can you tell us what a furan is? 18 A Yes. I can draw it for you if you want. 19 Q All right, sir. Do we have an extra pad that 20 we can provide the doctor? 21 A It's two benzenes that are connected by one 22 oxygen. 23 Q What are the chemical elements in a furan? 24 A Carbon. It depends on which furan, which one 25 you're talking about.
Page 6 1 Q (By Mr. McCrea) You may answer. 2 A If you will give me the question saying did 3 they ask you for this opinion, I can't recall. 4 Q Okay. 5 A Any myriad of opinions I might have given 6 during a couple hours of discussion I had with them. If 7 you ask me did they give you, did they ask you for an 8 opinion about this factor concerning PCB, I'll answer you 9 yes or no. 10 Q Were you asked to review the medical records 11 of the plaintiffs in this case? 12 A No. 13 Q Have you seen the medical records of the 14 plaintiffs in this case? 15 A No. 16 Q As a physician for Monsanto, have you reviewed 17 medical records of workers exposed to PCBs? 18 A Yes. 19 Q In preparing for this deposition, did you get 20 together with the attorneys and review questions that they 21 would address to you? 22 A They reviewed the general tenure of my 23 deposition. They were asking what they wanted to acquire 24 from me. They asked what particular facts and opinions I 25 had about the, my experience with Monsanto, my experience	Page 8 1 Q I don't know. Do they differ? 2 A Yes, certainly. 3 Q All right. 4 A It all depends on how much chlorine is in 5 there. 6 Q What are the different elements, the different 7 chemicals in a furan? 8 A Hydrogen, carbon, oxygen. 9 Q Does it have chlorine? 10 A You asked furans now. 11 Q Right. 12 A If it's a chlorinated furan it certainly has 13 chlorine, but you asked about furans. 14 Q All right. A chlorinated furan would have 15 carbon, hydrogen, oxygen and chlorine? 16 A That's correct. 17 Q Then there are also furans which are not 18 chlorinated? 19 A That's correct. 20 Q Which would only have carbon, hydrogen and 21 oxygen? 22 A If it's a pure furan you're talking about. 23 There are other -- There's a brominated furan, if you want 24 to get into that. 25 Q And that would have --

Page 9 1 A Bromine instead of chlorine. 2 Q All right. Are there other halogenated 3 chemicals associated with furans? 4 A Well, there's only one other halogen. That's 5 iodine, and I don't know if there are any iodine furans. 6 Q So there are essentially three variables of a 7 furan, and you've described those? 8 A No, that's not true. 9 Q I mean, three different sets of chemicals in a 10 furan. One would be carbon, hydrogen and oxygen. A 11 chlorinated furan would have those chemicals plus chlorine, 12 and a bromated -- Is that the word? 13 A That's certainly a word, yes. 14 Q Would have carbon, hydrogen, oxygen and 15 bromine? 16 A That's right. 17 Q Instead of chlorine? 18 A That's right. 19 Q Are there any other combination of chemicals 20 that make up a furan? 21 A Now, furans have oxygen, chlorine, hydrogen. 22 There are no changes in a furan. Now, you want to talk 23 about chlorinated furans? 24 Q Well, we have a pure furan. Then we have a 25 chlorinated. Then we have a bromated.	Page 11 1 Q And who was in charge of that laboratory at 2 that time? 3 A A Dr. Keller, K-e-l-l-e-r. 4 Q Was he the one who did the testing? 5 A I wouldn't know. 6 Q Were those results discussed with you? 7 A I don't have any particular recollection of 8 it. Somebody gave me the results. I don't know who gave 9 it to me, but there was no great discussion. 10 Q You stated that there was a varying amount of 11 furans in the batches of PCBs. Is that a correct 12 statement? 13 A To the best of my knowledge, there was some 14 variation, yes. 15 Q Was there any explanation as to why they would 16 have more furans in one batch of PCBs as opposed to another 17 batch of PCBs? 18 A No. Whether it was sensitivity to laboratory 19 methods or not, I don't know. There was no great 20 discussion because there was no large variation, no large 21 amounts of the furans, and they were talking about single 22 digit parts per million. 23 Q Was this testing reduced to writing? Were the 24 results reduced to writing? 25 A I've seen a memorandum about it on one
Page 10 1 A That's correct. 2 Q Are there any others? 3 A There may be laboratory curiosities. I don't 4 know of any. 5 Q Who requested that Monsanto do the testing for 6 furans in the early '70s which you described yesterday? 7 A I don't know. 8 Q Did you know that this testing was going to 9 take place? 10 A I knew after it was done. 11 Q Okay. From whom did you receive the 12 information that the testing had been done? 13 A Somebody in the analytical laboratory. This 14 was 18 years ago, 20 years ago. I don't recall the name. 15 Q What was the purpose of the testing for furans 16 as you understood it by Monsanto Company in the early '70s? 17 A To see if they were there. 18 Q Where was the testing done? 19 A I would -- To the best of my knowledge, it 20 would have been done at the research laboratory in St. 21 Louis. 22 Q Is that part of your main office? 23 A That's correct. 24 Q In downtown St. Louis or where is it? 25 A No, it's out on Lindbergh Boulevard.	Page 12 1 occasion. 2 Q What do you recall about that memorandum? 3 A Just that it had a couple of figures about the 4 amount of furan, of chlorinated furans in the material. 5 That's all I remember, and that the figures were under ten 6 parts per million. I don't know how far under. 7 Q Were they testing pure PCB? 8 A They were testing manufactured run PCB. 9 Q Did they test PCBs from Japan? 10 A I don't know. 11 Q You have never heard anyone from Monsanto 12 discuss the relative level of furan contamination of PCBs 13 comparing Monsanto's PCBs to the Japanese PCBs? 14 A I may have heard it. I mean, I have some 15 vague recollection that they said we had less than the 16 Japanese, but I don't have the figures. You must realize 17 the Japanese manufacture their PCBs in a different manner 18 than we do. 19 Q Do you know of any documents in the possession 20 of Monsanto which discuss the relative levels of furans in 21 Monsanto's PCBs compared to Japanese PCBs? 22 A I don't know if any exist or ever did exist. 23 I don't know. 24 Q But you do recall a discussion about the 25 very --

Page 13 1 A Well, there was -- 2 Q Just a second, please. 3 A Pardon me. 4 Q You do recall a discussion from people in 5 Monsanto about the relative levels? 6 A Well, I do -- I'm telling you that I do 7 recall, I have some vague recollection of people talking 8 over the relative amounts, but I don't recall the people 9 and I don't have any written data on it. 10 Q Was this data about the furan level in the 11 PCBs given to the government? 12 A I don't know. 13 Q Was it given to your board of directors? 14 A I don't know that, but I would doubt it. 15 Q Was it given to Westinghouse? 16 A I don't know. 17 Q Was it given to any public utilities? 18 A I don't know. 19 Q Was it given to anyone? 20 A I don't know. 21 Q Were any tests conducted by Monsanto to test 22 the furan level of PCBs after the PCBs had been heated? 23 A How do you mean heated? 24 Q Heated as the PCBs were heated in Japan when 25 they were used as a heat transfer fluid and escaped into	Page 15 1 A Various publications. 2 Q Can you cite any of them? 3 A Well, I can cite you one in '84. 4 Q Can you cite any in the late '70s when you 5 gained your knowledge? 6 A No, but this review in 1984 referred to some 7 work done previously. 8 Q Did you communicate the information about the 9 furans being enormously more toxic than PCBs to your board 10 of directors? 11 MR. CARNEY: Let me object. Since he said he 12 learned in the late '70s, that would mean he was retired 13 from Monsanto. So when you say your board, it doesn't make 14 much sense. 15 Q (By Mr. McCrea) I stand corrected. Dr. 16 Kelly, based on the number of times that you've served as 17 an expert fact witness for Monsanto, do you have any 18 knowledge of personnel in Monsanto communicating to the 19 board of directors that furans were enormously more toxic 20 than PCBs? 21 MR. MCCREA: I'm going to object to that. I 22 don't think since Dr. Kelly's retirement there's been any 23 foundation laid that he has any contact with the board of 24 directors. I'm not sure he had any contact with the board 25 before he was retired, but I'm quite confident he didn't
Page 14 1 the rice oil, a similar type elevation of temperature. 2 A I don't know. 3 Q How are furans formed in PCBs? 4 A I don't know the chemistry of the formation of 5 furans in PCBs. 6 Q What is the difference between a chlorinated 7 furan and a chlorinated PCB as far as the chemical elements 8 in the two compounds are concerned? 9 A Well, if you are just talking about chemical 10 elements, there are large varieties in the way these 11 chemical elements are mixed up. Here we have two benzene 12 rings that are connected by oxygen. That's an entirely 13 different compound. The two benzene rings are connected 14 just by themselves. So you cannot rationalize saying, 15 "Well, we've got one oxygen and that's furan and we don't 16 have an oxygen in the PCB, so they're practically the 17 same." Well, that is nonsense. 18 Q Is a furan more toxic? 19 A Yes, enormously more. 20 Q When did you know -- 21 A Chlorinated furan, sir. 22 Q When did you know that a chlorinated furan was 23 enormously more toxic than a PCB? 24 A Late '70s, I suppose, sometime in the '70s. 25 Q How did you learn that?	Page 16 1 have any contact with the board, so there's no foundation 2 for him having any potential for knowledge about that 3 question. 4 Q (By Mr. McCrea) You may answer. 5 A I don't know of anybody who has talked to the 6 board of directors about anything since I retired from 7 Monsanto. 8 Q Do you know of any information which was given 9 by Monsanto to the United States Government that reflects 10 your knowledge that furans are enormously more toxic than 11 PCBs? 12 MR. CARNEY: I'm going to object to that 13 question because it would call for this witness to answer, 14 try to answer a question after he was retired from the 15 company, so there's no foundation that he would know what 16 Monsanto did or didn't do. 17 Q (By Mr. McCrea) You may answer. 18 A No, I don't know, but I certainly know that 19 the government read the same articles that Monsanto 20 scientists did. They read the same ones I did, so it 21 really is, it's an overkill as it were. 22 Q How do you know that? 23 A Because I know the caliber of the scientists 24 in the government. I know the people that have been 25 writing on it. You see lots of articles coming out from

Page 17 1 various divisions of the United States Government. 2 Q Can you name one individual? 3 A Sure. I'll give you Kimbrough as a starter. 4 Q Okay. And -- 5 A She wrote a book on PCBs and halogenated 6 hydrocarbons. She wrote several articles, review articles 7 that included information about dibenzofurans and 8 dibenzodioxins. 9 Q Did the government ever ask Monsanto for test 10 data as to the amount of furans in its PCBs? 11 A I have no knowledge of any such request up to 12 1974. Whether they did after '74 or not, I don't know. 13 Q And you have no knowledge up to '74 of that 14 data being given to the government? 15 A Never been asked. I said I have no knowledge 16 of being asked for it by the government. 17 Q And also you have no knowledge that Monsanto 18 gave that data to the government? 19 A No, I have no knowledge of that. 20 Q Can you explain why furans are enormously more 21 toxic than PCBs from a toxicological standpoint? 22 A No, I cannot, except they are. That's all. 23 Q To this date, Dr. Kelly, do you know if 24 Monsanto has conducted any tests to determine the amount of 25 furans in PCBs after they are heated?	Page 19 1 A I can't answer that. I wasn't connected with 2 Monsanto at that time. 3 Q But the testing for furans was before your 4 retirement and you've described that? 5 A That's correct. 6 Q And Monsanto continued production until some 7 three years after your retirement, 1977? 8 A I don't know if it was '77. I can't tell you 9 that. 10 Q Was there any effort to reduce the amount of 11 furans in PCBs after the testing was done by Monsanto and 12 before they stopped production? 13 A I don't know if there was or not. 14 MR. CARNEY: I'm going to object to that 15 question. Again there's no foundation that this witness 16 would be in a position to know that since he retired in 17 '74, and anything after that time he wouldn't have been 18 involved. 19 Q (By Mr. McCrea) Was there any effort, Dr. 20 Kelly, to reduce the level of furans at Monsanto Company 21 before your retirement in 1974? 22 A There may or there may have been not. I do 23 not know. I do not know of any, but at that particular 24 time it was not critical to us because we knew the toxicity 25 of our PCBs and that toxicity included the presence of
Page 18 1 A I do not know if they have or not. They may 2 have. I may have had some recollection in the past. I do 3 not have any recollection at the present time. 4 Q Was there any effort by Monsanto to eliminate 5 furans in its PCBs after the testing was done in the early 6 '70s and the furans were detected by analytical methods? 7 A Well, I don't know that, but you must 8 remember, by the time that analytical expertise was present 9 to look for furans, we were phasing out of the business. 10 This was -- As I said, this was in the late '70s or the mid 11 '70s that we're in a position to examine for furans, and we 12 were getting out of the business. 13 Q You retired in '74? 14 A That's correct. 15 Q This testing took place before your 16 retirement? 17 A Yes, it did. Well, in the mid '70s, I think. 18 Q Well, it took place while you were there? 19 A Yes. 20 Q Monsanto didn't stop manufacturing PCBs until 21 after the Toxic Substances Control Act in 1976; correct? 22 A I said they were phasing them out. I didn't 23 say they stopped manufacturing them. 24 Q All right. I understand. What was the month 25 and year that Monsanto stopped all production of PCBs?	Page 20 1 these furans, and we knew those furans were in that. We 2 were manufacturing it the same way for 30 years, so if we 3 had furans in 1972, we had the same furans in 1974 and we 4 knew what the toxicity was, so we were not concerned about 5 it as an industrial chemical. There was no problem from 6 the toxicity point of view in our minds. 7 Q But you also knew that the episode in Japan 8 involved heating the PCBs; correct? 9 A Heating and eating, yes. 10 Q Right. And eating is a means by which PCBs 11 are absorbed into the body; correct? 12 A Well, it's one of the ways. 13 Q And they also are absorbed into the body by 14 going directly through the skin; correct? 15 A That's correct. 16 Q And they also absorb into the body by being 17 breed? 18 A That's correct. 19 Q So they get into the body three ways? 20 A That's correct. 21 Q And you knew that in Japan the PCBs had been 22 heated; correct? 23 A Yes. 24 Q And did you ever attempt to duplicate the 25 toxicity of your PCBs by heating them and then presenting

Page 21 1 animal species for absorption of the heated PCBs? 2 MR. CARNEY: Let me object. I don't think 3 there's any foundation that Dr. Kelly knew these details at 4 the time of his retirement. There's some question, as you 5 recall yesterday, as to when the Yusho incident was 6 published in the English language, and so I think your 7 question is, there's no foundation for it since if he 8 retired and didn't have that information, he wouldn't know 9 what Monsanto did after his retirement. 10 Q (By Mr. McCrea) Dr. Kelly, did you know that 11 the Yusho incident involved PCBs which were heated before 12 your retirement. 13 A Yes, yes, I did. 14 Q Did you know that the Yusho incident involved 15 furans as a contaminant before your retirement? 16 A That is hard for me to recall because it was 17 at least one or two years, several years afterwards that 18 the analytical work done by the Japanese was done. There 19 was also then some time after the Japanese work was 20 translated into English or appeared in the English 21 literature and -- Let me finish, please. 22 So I have seen numerous documents in these various 23 PCB depositions, and I am unable at this time to recall if 24 these documents which reflected the presence of 25 dibenzofurans in heated PCBs were shown to me after I	Page 23 1 A I got that from Masuda, M-a-s-u-d-a, "American 2 Journal of Industrial Medicine", November 1984. He stated 3 that persons consumed between 195 and 3,375 milliliters of 4 rice oil. That translates down to half a pint to three 5 quarts roughly. 6 Q How many ounces, grams or milligrams of PCB 7 were consumed? 8 A During that period of time if you took -- 9 Well, to take a round figure, if you divide 3,375 that's, 10 and there was less than a thousand parts of the PCB in the 11 rice oil, a thousand parts per million, a thousand parts 12 per million, so there would be 1,000. It would be three 13 milliliters. That was a half a teaspoon. It was a 14 teaspoonful. 15 Q How many milligrams would that be? 16 A According to my figures, 3.3. 17 Q 3.3 milligrams? 18 A Milliliters. I have to -- 19 Q Why don't you calculate for us the amount of 20 PCB which was ingested by the Japanese at the low range, 21 195 milliliters, and the high range? 22 A You have a calculator here, by the way? 23 Q What? 24 A You have a calculator? 25 Q I'm sorry. They might have one in the
Page 22 1 retired in 1974 or whether they were memoranda that I saw 2 prior to 1974. I would believe it's the former because I'm 3 not so, I do not believe that I saw data concerning the 4 development of furans in the heated Japanese heated 5 Kanaclor. I just -- I can very well be confused with 6 memoranda that I had before 1974 or documents that were 7 shown to me during these numerous PCB depositions that I've 8 undertaken. 9 Q Dr. Kelly, do you know of any other reason why 10 the Monsanto people in the analytical laboratory were 11 testing for furans in the Monsanto's PCBs other than the 12 concern of its toxicity as was demonstrated in Japan? 13 A I don't know, and I don't know whether they 14 did it because of the concern over toxicity. 15 Q You know that people were poisoned in Japan? 16 A Yes. 17 Q You know that those people consumed PCBs? 18 A They consumed PCBs. They consumed chlorinated 19 benzofurans. They consumed quaterphenyls. They drank 20 quite a lot of it. You asked me yesterday about the 21 ballpark figures. They drank from a half a pint to three 22 quarts of the rice oil over the course of the months. Yes, 23 we knew that. 24 Q Where did you get that information between 25 yesterday and today?	Page 24 1 building. At the low range, 195 milliliters and the high 2 range, 3,375 milliliters? 3 A Well, if you consumed 195--let's make it 200 4 -- and if they had 200,000 parts of PP per million, they 5 would probably take--unless I've lost a few zeros in here 6 -- 200, .02 milliliters of PCB the low level, and it's 7 about 16 times that much for the high level. 8 Q All right. How many -- How much is that in 9 milligrams? 10 A Well, it's roughly the same. I mean, give or 11 take ten percent. I don't know the specific gravity of 12 PCBs, but it's pretty close. 13 Q All right. So approximately how many 14 milligrams were ingested at the level of 200 milliliters of 15 rice oil? 16 A 200ths. That would be .02. 17 MR. CARNEY: Would it help you, Doctor, to 18 have a calculator? 19 A Well, it would be easier. 20 MR. McCREA: Could we take a break and then 21 see if there's a calculator in the building? 22 MR. CARNEY: Why don't we do it at the break 23 rather than, you know, we'll have a break and -- 24 MR. McCREA: Well, I'd like to stay so that 25 there's continuity for the jury.

Page 25 1 A Well, if we have, if the person at the low 2 level consumed 200 milliliters of rice oil, and let's 3 assume also with an error of ten percent, that's 200 4 milligrams of rice oil, and if that 200 milligrams of rice 5 oil had 1,000, 1,000 parts per million so that we get 1,000 6 of it, that's .2 milligrams of rice oil. That's correct, 7 .2 milligrams of rice oil at the low level and the high 8 level 16 times that. That's 3.2 milligrams at the high 9 level of PCB in the rice oil, of PCB that they consumed. 10 Q So the total amount of PCB that the Japanese 11 consumed which poisoned them was how much in milliliters? 12 A Well, we're not saying that the PCBs poisoned 13 them. 14 Q Well -- 15 A It was the dibenzofurans that caused that. 16 Q We'll get to that, but first I want to know 17 PCBs. How many milliliters -- how many -- Excuse me. How 18 many milligrams? 19 A Between 2/10 of a milligram and 3.2 20 milligrams. 21 Q And that's based on the information from? 22 A Well, the "Annals of Industrial Medicine", 23 November 1984, and if you want to continue in that same 24 journal, Dr. Kabuto stated it was clear that the PCDFs, the 25 dibenzofurans chlorinated were the main causative agent in	Page 27 1 and their offspring? 2 MR. CARNEY: I'm going to object to that. He 3 didn't do it in milligrams, but he gave you the information 4 in quarts and pints which I think the average person 5 understands a lot more than milliliters or milligrams, and 6 I think he indicated he read that letter back in '84. 7 A Your answer is completely wrong. Your 8 question's completely wrong. I did know it. 9 Q (By Mr. McCrea) All right. What was the 10 amount of PCB consumed by the Japanese which poisoned the 11 people who ingested it and caused birth defects in their 12 children? 13 A Now, just a moment. It was not the PCBs. 14 Q Just a second. All right. Let's have three 15 calculations; all right? Do you know, Dr. Kelly, from your 16 knowledge as the former medical director of Monsanto and 17 based upon your testimony in numerous cases involving 18 Monsanto and PCBs what the quantity of PCBs was that was 19 ingested, what the quantity of furans was that was ingested 20 and what the quantity of quaterphenyls was that was 21 ingested by the Japanese which poisoned them and caused 22 birth defects in their children? If so, would you tell us? 23 MR. CARNEY: I'm going to object to it as a 24 compound question. You've asked three questions. If you 25 break it down, what was PCBs and then go on to the rest.
Page 26 1 the case of Yusho disease because he gave comparative 2 amounts of the dibenzofurans to monkeys and he got the skin 3 problems, the thymus atrophy in rats. He got skin problems 4 in the monkeys, thymus atrophy in rats, and he gave the 5 PCBs to them and he didn't get anything. So he was the one 6 that concluded -- That was the basis for his conclusion as 7 written in the "American Journal of Industrial Medicine" 8 that it was clear that the PCDFs or the chlorinated 9 dibenzofurans were the main causative agent in the Yusho 10 poisoning. 11 Q What was the quantity of furans ingested? 12 A Much smaller, much, much smaller. 13 Q Can you calculate that for us? 14 A I don't think I can. It was much, much 15 smaller by a couple of magnitudes. It would be ten 16 hundred, something like that. 17 Q Now, you're working through these calculations 18 on June 1, 1990 for the first time. Is that correct, 19 Doctor? 20 A That's correct. 21 Q And -- 22 A Well, not through the calculations. I looked 23 at the figures. I didn't go down to check out the exact -- 24 Q But until this date, you have never known the 25 amount of PCBs ingested by the Japanese which poisoned them	Page 28 1 MR. McCREA: Tom, that would be fine, but 2 every time I ask him about PCBs he says it's not the PCBs, 3 it's the furans. 4 MR. CARNEY: Well, you can ask him what the 5 quantity was in PCBs and I think he can tell you that. 6 A Do you have this article, this series of 7 articles with you with all those exhibits you have? I'll 8 read them out of there. 9 Q (By Mr. McCrea) I'm asking you if you know. 10 A Well, I know where to get the information. 11 Q No, Doctor. Unfortunately in this situation I 12 ask the questions; all right? Now, if you don't know, 13 we'll get the articles. I don't have any trouble with 14 that. I'm just asking you if you know. 15 A Yes. To the best of my knowledge, persons 16 consumed 195 to 300, 3,375 milliliters of rice oil which 17 contained 920 parts per million of PCB. 18 Q 920? 19 A 920. 20 Q Parts per million PCB? 21 A That's correct. 22 Q All right. And what -- Okay. Thank you. 23 Now, how many parts furan? 24 A Someplace between five and 18 parts per 25 million of furans.

Page 29 1 Q Five and 18 parts per million furans? 2 A That's correct. 3 Q All right. And how many for quaterphenyls? 4 A I don't have those figures. 5 Q All right. Now, Doctor, without calculating, 6 can you give the injury the amount of PCBs ingested? Do 7 you know that figure? 8 A Something between .2 milligrams and 3.2 9 milligrams. 10 Q And how many milliliters is that? 11 A Well, roughly the same depending on the 12 specific gravity of PCBs. I don't know what that is. 13 Q .2 milliliters? 14 A Huh? 15 Q .2 milliliters? 16 A Yes, to 3.2 milliliters. 17 MR. CARNEY: It might be helpful to the jury 18 to give it in quarts or pints because at least I don't, I'm 19 not adapted to milliliters or milligrams. I'm one of these 20 old fogies that doesn't understand that. That's kind of 21 gibberish. 22 Q (By Mr. McCrea) All right. I think that's a 23 good suggestion from Counsel. Can you express the amount 24 of PCBs in quarts or pints that were ingested by the 25 Japanese which caused their health problems? Then the same	Page 31 1 Q Did you know that information before today? 2 A Yes, I've read it, yes. Remember, you also 3 have to take this into consideration what is the lethal 4 LD50 of PCBs. That's 4,000 milligrams. 5 Q But it only took 1/100 of an ounce and 6 1/10,000 of an ounce of this compound to poison these 7 people? 8 MR. CARNEY: Well, I'm going to object. 9 You're mixing apples and oranges. The testimony -- Are you 10 talking about PCBs? Are you talking about furans? 11 Q (By Mr. McCrea) Tom, if you listen to the 12 question. Doctor, it took 1/100 of an ounce of PCBs and 13 1/10,000 of an ounce of furans in the PCBs in Japan to 14 poison those people? 15 MR. CARNEY: Let me object to it. You've 16 asked two questions, and if you want to ask him one at a 17 time, that's fine, but I'm going to object. It's a 18 compound question. You're asking two questions in one, and 19 which one do you want him to answer? 20 MR. McCREA: Well -- 21 MR. CARNEY: If you'd ask them one at a time, 22 I'll withdraw my objection. Otherwise, I object as 23 compound. 24 MR. McCREA: I have this problem because when 25 I ask him about PCBs, he blames it on furans.
Page 30 1 question for furans, first as to quarts. 2 A No, there's an extremely low fraction of a 3 quart. 4 Q I'm just taking the suggestion of Counsel. 5 A Well, I'd have a decimal point with a bunch 6 of zeros in back of it. I don't think that's helping 7 anybody. 8 Q So it would be less than an ounce? 9 A Oh, yes, less than an ounce. 10 Q Less than half an ounce? 11 A Yes, less than half an ounce. 12 Q Less than a quarter of an ounce? 13 A Yes. 14 Q Less than a tenth of an ounce? 15 A Yes, it would be a fraction of an ounce. 16 Q Less than a hundredth of an ounce? 17 A Around that. 18 Q Around one-hundredth of an ounce? And can you 19 tell the jury in quarts or pints what quantity of furans 20 was consumed which poisoned the people who ingested it and 21 caused birth defects in their children? 22 A About one-hundredth of that. 23 Q So that would be a hundred times a hundred, 24 1/10,000 of an ounce? 25 A Something of that order.	Page 32 1 MR. CARNEY: That's because that's what the 2 authors in Japan blamed it on. The experts have blamed it 3 on furans. I know you don't like that. You would like to 4 blame PCBs, but the experts disagree with you, Mr. McCrea. 5 MR. McCREA: No, we're satisfied with the 6 furans in your PCBs. 7 MR. CARNEY: Well, they were about one 8 one-hundredth of the number in the Monsanto PCBs as in the 9 Japanese PCBs which you don't like to hear, either. 10 MR. McCREA: Where did you get that data? 11 MR. CARNEY: I can supply that data for you 12 later on if you want. 13 MR. McCREA: Is that after it was heated? It 14 was in Japan? 15 MR. CARNEY: Do you have a question? 16 MR. McCREA: I'm just asking you. You're 17 volunteering this information. 18 MR. CARNEY: I'll be glad to give you the 19 information, but I think -- I'm not under oath. I think 20 Dr. Kelly is the one you should be directing your questions 21 to. 22 MR. McCREA: You're supplying information, and 23 we'll be happy to review it, so if -- I assume that -- Do 24 you have that with you today. 25 MR. CARNEY: Why don't you ask another

Page 33 1 question. 2 MR. McCREA: Do you have it with you today? 3 MR. CARNEY: I don't have that information 4 with me. I don't carry all the information with me. 5 MR. McCREA: But you are volunteering it; 6 correct? And you will provide it? Thank you. 7 Q (By Mr. McCrea) Dr. Kelly, there's no dispute 8 in medical science that the Japanese people were poisoned 9 and their offspring suffered birth defects after the women 10 consumed one ten-thousandth of an ounce of furans. Is that 11 a fair statement? 12 A I think it is because the lethal dose, the 13 lethal dose 50 for furans is in the neighborhood of 1/1,000 14 of a milligram. Now, that is pretty small. Now, that's, I 15 have that figured for dioxin, chlorinated dioxin, and furan 16 is somewhat less toxic. I don't have the exact figure, but 17 1/10,000 of a milligram per kilo is the lethal dose for 18 rats, and if you compare that to the PCB dose is 2,000 to 19 4,000 milligrams or something like 40 -- well, it's 20 something over -- you take the dose of 2,000 milligrams per 21 kilo and the furan is 0001 milligram. This is ten hundred, 22 thousand. That's 1/2,000 roughly. It's less than -- It's 23 more than that. 1/20,000 of the lethal dose of PCBs. 24 Q Okay. 25 A So we're dealing with two compounds you're	Page 35 1 A There are 1,000 people had various symptoms in 2 Yusho. I do not have the figures for what those 1,000 3 people, what the amount of dibenzofurans, the total amount 4 that those 1,000 people took. That may be someplace. I do 5 not have that. 6 Q (By Mr. McCrea) Well, Doctor, isn't it a fact 7 that based on the testimony you've give us here this 8 morning, based on the article that you have read, based on 9 your calculations, that one ounce of furans is sufficient to 10 poison 10,000 people? Isn't that a fact? 11 A No. I think, Mr. McCrea, that may very well 12 be a fact, but I would certainly have to have a more 13 elaborate set of calculations and have my calculations gone 14 over by a mathematician. So I cannot answer that question. 15 It is very easy to drop a couple of zeros when you're 16 talking about translating from ounces to milligrams to 17 parts per million, so that I can not be certain of my 18 calculations. 19 Q Is it probable -- Do you have an opinion based 20 upon medical probability as to whether or not one ounce of 21 furans is sufficient to poison 10,000 people? 22 A I can't be sure. I do not have that opinion 23 at present, no. 24 Q Your calculations would indicate that is true? 25 A Yes, but I mean, I'm doing a hurry-up set of
Page 34 1 talking about. One has a relatively low toxicity. The 2 other has one of the most extreme toxicities of any 3 compound since the beginning of chemistry. 4 Q One ounce of furans would be enough to poison 5 10,000 people? 6 A Yes, I think so. 7 Q And cause birth defects in their children? 8 A It could be. I do not know what the toxicity 9 of the material is as far as humans are concerned. If 10 we're talking about rats, that's one thing. 11 Q No, I'm talking about Japan. Let's get this 12 clear because you may not be at trial. One ounce of furans 13 based upon the data that you have given us today in this 14 deposition would be sufficient to poison 10,000 people and 15 cause birth defects in their children based upon the data 16 from Japan which you have given us? 17 A If I have -- If I have translated these 18 figures correctly, that is correct. 19 MR. CARNEY: I'm going to object to that. 20 You're saying -- are you saying -- I think you're 21 mischaracterizing Yusho, that those, all those mothers have 22 birth defects in their children. I don't think that's the, 23 what the literature says and that's kind of a trick 24 question that you've asked, but I don't think there's any 25 support in the literature for that.	Page 36 1 calculations and I could very easily have misplaced some of 2 the figures. I accept the fact that this is an extremely 3 toxic compound, but... 4 MR. CARNEY: By it, would you -- 5 A It, dibenzofurans. It is an extremely toxic 6 compound, but to make that jump from there to one ounce of 7 the material poisoning 10,000 people, I think I'd have to 8 be more sure of my calculations and I'd have to know the 9 time these people took this ounce, what part of the ounce 10 or else divide among 10,000 people a tenth of an ounce, 11 10,000 of an ounce in each person over what period of time. 12 I would have to do quite a lot more calculations where I 13 can't at the present time. 14 Q (By Mr. McCrea) How many milligrams are there 15 in a gram? 16 A 1,000. 17 Q How many grams are there in an ounce? 18 A 30. 19 Q How many milligrams are there in an ounce 20 then, 30,000? 21 A Yes. 22 Q Thank you. Again, Doctor, you have known that 23 furans are extremely toxic for what period of time? 24 MR. CARNEY: Now we're getting very 25 repetitive. I'm going to object to the repetitive nature

Page 37 1 of these questions, and also we're talking about furans 2 and -- 3 MR. McCREA: Presumably the same furans that 4 were found in your PCBs. 5 MR. CARNEY: Well, you're trying -- 6 MR. McCREA: Just a second, please. By 7 Monsanto when they tested in the early '70s. 8 MR. CARNEY: In under ten parts per million. 9 That would be a drop in the, a drop of it in a swimming 10 pool. You're talking about an infinitesimal amount and 11 you're trying to act like -- 12 MR. McCREA: How much is 1/10,000 of an ounce? 13 MR. CARNEY: It's a lot more than a couple of 14 parts per million if that's -- 15 MR. McCREA: It's ten parts per million? 16 MR. CARNEY: That's the maximum he said it 17 was. Ten parts per million was the maximum. He said it 18 was under ten parts per million. We're talking about one 19 or two or three parts per million, Mr. McCrea, and we've 20 tested and you've just heard the testimony that the very, 21 very infinitesimal amount of furans in the PCBs that 22 Monsanto made did not cause any illnesses and was very, was 23 not very toxic at all. So you're confusing furans, or I 24 think you're attempting to try to confuse the jury with 25 furans which are toxic with PCBs which aren't.	Page 39 1 Which depositions did the subject of furans get raised? 2 A I don't recall, and I might add to some -- 3 Q Just a second. Would you restrict yourself to 4 the question? 5 A Okay. Can I -- 6 MR. CARNEY: I think you have to allow him to 7 clarify. 8 A Can I clarify one of my previous answers or 9 not? 10 Q (By Mr. McCrea) Yes, sir. 11 A You are using the word chlorinated 12 dibenzofurans as a basket term. There are probably 70 13 different types of chlorinated dibenzofurans that exist and 14 the toxicity varies greatly with how to make chlorine 15 atoms, where these chlorine atoms are arranged, and to the 16 best of my knowledge, that information concerning Yusho and 17 furans in either Monsanto or Japanese PCBs has, I don't 18 have that information as far as my knowledge is concerned. 19 So that if you make a blanket statement of toxicity 20 of a dibenzofuran, chlorinated dibenzofuran, I think you 21 would have to limit yourself to is it 3-4-7-8 or any of the 22 other various configurations for the chlorine, of atoms 23 hooked on to the molecule. 24 Q Which of the molecules of furan are most 25 toxic?
Page 38 1 MR. McCREA: You would acknowledge that furans 2 are enormously toxic, Mr. Carney? 3 MR. CARNEY: I think that's been the 4 testimony. I think that -- 5 MR. McCREA: Would that be stipulated by 6 Monsanto? 7 MR. CARNEY: I'm not stipulating to anything. 8 I think it's not up to us. The witness here is a 9 knowledgeable person and he's testifying and that's what he 10 said, and I'll stipulate that that's what he's testified 11 to. 12 Q (By Mr. McCrea) Thank you. Doctor -- 13 A I will say something, too. 14 Q Dr. Kelly, just a second. If I may ask a 15 question, please. 16 A Yes, you sure may. 17 Q Dr. Kelly, you have been asked, have you not, 18 to testify in cases involving furans on behalf of Monsanto? 19 A Not involving furans, no, sir. 20 Q Is it your testimony today that you have not 21 testified in any cases involving furan toxicity? 22 A Well, that's -- I have been asked to testify 23 towards the toxicity of PCBs, and the question of furans 24 came up during the course of those depositions, yes, sir. 25 Q Okay. And which deposition -- Thank you.	Page 40 1 A I think 2-3-7-8. 2 Q Has Monsanto done toxicity testing on the 3 various molecules of furans to determine their relative 4 toxicity? 5 A They did not until 1974. I do not know what's 6 been done afterwards. 7 MR. McCREA: Okay. Can we take a break now? 8 Thank you, Dr. Kelly. 9 (Thereupon, a short recess was taken. The reporter 10 marked Plaintiff's Deposition Exhibit One, for 11 identification.) 12 Q (By Mr. McCrea) Dr. Kelly, the court reporter 13 has marked an exhibit as Plaintiff's Exhibit One dated 14 6-1-90, and I will hand you the exhibit and ask you, sir, 15 if you would first look at the exhibit and see if you can 16 identify that as having been read by you before today's 17 date? 18 MR. CARNEY: Let me object to the question. 19 Mr. McCrea, you just tore out a page out of a booklet. 20 MR. McCREA: Mr. Carney, if I may. 21 MR. CARNEY: Can you -- It seems to me it's 22 unfair to tear out a page in a one inch booklet, and I 23 don't know that I've ever seen the booklet before. Have I? 24 MR. McCREA: Well, what this booklet has in it 25 is a series of 27 documents. The only page referring to

Page 41 1 this particular document has been taken from the booklet. 2 I do not have the remainder of the document. If I did, I 3 would be happy to provide it to Dr. Kelly. 4 MR. CARNEY: Let me just -- Could I take a 5 look at what the document you gave -- 6 MR. McCREA: Certainly. It's page 13, and at 7 the upper right is the information as to the subject 8 matter, and if he can't identify it, that's fine. 9 MR. CARNEY: All I want to point out for the 10 record is that you've handed him one page, a page 13 that 11 you just tore out of this notebook and it doesn't have the 12 -- I don't know how many pages were in the document. We 13 know there are at least 12 pages before this page. It 14 starts in the middle of a subject that you don't even have 15 the entire subject that would be on the prior page. Then 16 it breaks off in the middle of a sentence at the last page, 17 so we know there must have been at least one other page. 18 At the bottom it talks about page 291. I don't know if 19 this is out of a something that has 291 pages or not, but I 20 just think it's -- I would object to handing out one page 21 of a document that isn't titled or there's no indication of 22 who the author is and there's no indication of what pages 23 came before and after it. So that's my objection for the 24 record. 25 MR. McCREA: And I think that's a valid	Page 43 1 Workers," and I would like to have seen what these same 2 people found in the capacitor workers, but I don't have 3 that. I can see where you didn't. 4 Q I move to strike the comment of Dr. Kelly. He 5 knows that that's an improper statement. We'll be 6 discussing the capacitor workers later on. 7 A All right. 8 Q All right. Dr. Alexander, Blair Smith and 9 others; all right, sir? 10 A Uh-huh. 11 Q Now, Dr. Kelly, if you would please restrict 12 your answers to my questions and not volunteer information, 13 we'll be out of here much earlier and the jury will get -- 14 A Fine. 15 Q -- through this much quicker. 16 A I'm ready for your question. 17 Q All right. Would you read the first two 18 paragraphs on this document and the footnote? 19 MR. CARNEY: To himself? 20 Q (By Mr. McCrea) To himself, and I'll ask you 21 if that data in those paragraphs is consistent with your 22 knowledge on the subject discussed therein. 23 MR. CARNEY: Well, I'm going to object to this 24 format. Again I think you asked him originally if he's 25 ever, if he can identify that document and if he can't say
Page 42 1 objection, but I'm just asking the witness if he's seen 2 this data. If he hasn't, he hasn't. If he has, he has. 3 MR. CARNEY: Are you asking if he's seen that 4 particular document? 5 MR. McCREA: Correct. 6 MR. CARNEY: Okay. 7 MR. McCREA: And I think your objection is 8 totally valid, and if he can't identify it, I'm not going 9 to continue with the questioning. 10 A I may have seen it, but I certainly don't 11 recognize it in this fashion. Could I see what -- Is this 12 booklet, this book of yours have anything to do with this? 13 Q (By Mr. McCrea) No, sir, it does not. 14 A I mean, let me get this clear. This is 15 something that was taken out of some publication or 16 conceivably a publication and put in this booklet of yours 17 or this -- 18 Q That's correct, that's correct. This is one 19 page from a document consisting of many more pages. 20 Unfortunately, Dr. Kelly, I do not have the remainder of 21 that document. If I did, believe me, I would bring it 22 because it would be much easier to identify. I just do not 23 have it now. 24 A I would have some doubts about that because 25 where it stops it says, "Clinical Studies of Capacitor	Page 44 1 that he ever saw that document, you weren't going to go any 2 further. Again I object as showing one page of a 3 multi-page document that is totally incomplete and very 4 difficult to identify. I think the initial question ought 5 to be has he ever seen that particular document before and 6 if he -- I don't think you can cross examine him on 7 something or ask him to read something that can't be 8 identified. 9 Q (By Mr. McCrea) I think your objection is 10 well taken. Dr. Kelly, have you ever seen that page before 11 to your knowledge? 12 A That particular page? I do not recall having 13 seen it. 14 Q Thank you. See how easy it is? Dr. Kelly, 15 have you ever read any information which indicates that the 16 toxicity threshold dose for furans which caused the health 17 problems in the Japanese and the birth defects in children 18 was .6 milligrams? 19 MR. CARNEY: I'm going to object. You're 20 talking about birth defects in children. I think that's 21 inflammatory, and we're talking about furans. Again you're 22 trying to mix up furans with PCBs which is confusing and 23 inflammatory. 24 Q (By Mr. McCrea) Doctor, did you not state 25 earlier in your testimony that the children born to the

Page 45 1 mothers who ate the contaminated rice oil had birth defects 2 such as in their teeth, their skin and other problems? Did 3 you not state that? 4 A I didn't say the other problems. I do not 5 know if I used the word birth defects, and if I did, I 6 think it ought to be clarified because birth defects means 7 a lot different to a lot of different people. So we are 8 talking the Japanese children had pigmentation of their 9 skin. They had premature eruption of the teeth and they 10 may have had chloracne. They had skin problems. I do not 11 recall any other conditions which could be termed birth 12 defects. 13 Q Dr. Kelly, have you read medical literature 14 which has discussed the health problems of the children 15 born to the mothers who ate the contaminated rice oil? 16 A Yes, I have. 17 Q And can you give us the titles of those 18 articles and the authors and the dates as best you recall? 19 I don't expect you to remember every single word. 20 A Yes. I think one is a review by Dr. Kimbrough 21 in 1987 or '88. The other in the "Journal of Industrial 22 Medicine" in 1984. That authors, Dr. Kimbrough obviously 23 is the United States national, and the authors of the 24 others are Japanese nationals. 25 Q What did Dr. Kimbrough state about the health	Page 47 1 present time. 2 Q Do you know Walter J. Rogan, National 3 Institute of Environmental Health Sciences, Research 4 Triangle Park, North Carolina? 5 A No, I don't. 6 Q So you haven't read his article? 7 A You didn't ask that. You said -- 8 Q Have you read an article? 9 A I don't know which is the article. You show 10 me. I'll tell you whether I read it or not. 11 Q Fair question. Have you read an article 12 published by Walter J. Rogan concerning "Congenital 13 Poisoning by Polychlorinated Biphenyls and Their 14 Contaminants in Taiwan"? 15 A I may have. If you show me the article, I can 16 tell you if I read it. I do not recall whether I read it 17 or not. 18 Q Okay. We'll get to that later. 19 A That's all right with me. 20 Q Now, my question is, Doctor: How would you 21 describe the Yusho health problems? 22 A I think it was a severe episode of accidental 23 poisoning by eating contaminated industrial fluids. 24 Q What was the toxicity threshold dose which 25 caused this severe poisoning from the standpoint of furans?
Page 46 1 problems of the children? 2 A It was in one of the exhibits, and I would 3 rather read it rather than trying to commit it from memory. 4 Q You do not recall? 5 A Yes, I recall, but I want to be precise, Mr. 6 McCrea. 7 Q Well, I think the document -- Just a second. 8 I think the document will speak for itself. The fact is 9 you don't recall what was in the article? 10 A Yes, I can recall the gist of it, certainly, I 11 can recall. 12 Q What was the gist of it? 13 A The gist of it was we had 39 or so babies with 14 pigmentation, some early eruption of the teeth, and after 15 examining or on reexamination, a large percentage of them 16 had cleared up. 17 Q Okay. Thank you. Now, what was the other 18 article? 19 A Well, that was an article in the "American 20 Journal of Industrial Medicine" by some Japanese author. 21 Q And what was the gist of that article, sir? 22 A Well, he described the skin problems with the 23 children. 24 Q Anything else? 25 A There may be more. I cannot recall it at the	Page 48 1 A Would you tell me what you mean by toxicity 2 threshold dose? 3 Q Does that not -- 4 A It's not a common term. 5 Q That would be the dose necessary to cause 6 health problems as I would understand it. Toxicity 7 threshold dose. What minimum amount of furans would cause 8 the health problems? That's how I understand it. Not the 9 maximum, but the minimum, the threshold. 10 MR. CARNEY: What do you mean by health 11 problems? Are you talking about any particular type or -- 12 There are all kinds of health problems. 13 MR. MCCREA: Well, the health problems which 14 are documented in the literature that were experienced by 15 the Japanese when they ate the contaminated rice oil which 16 had PCBs and furans. That's what I'm talking about. Is 17 that clear? 18 MR. CARNEY: Well, I'm not clear on it, but if 19 the witness is, he can answer. 20 A I'm not too clear on it either because there 21 were various problems. Some -- 22 Q (By Mr. McCrea) All right, Doctor. 23 A May I finish? 24 Q The question is: What was the minimum -- What 25 was the toxicity threshold dose for furans which caused

Page 49 1 this variety of problems, if you know? 2 A Well, you would have a different dose for a 3 different problems. In other words, you would have a very 4 minor problem which would have one threshold limit, as you 5 phrase it, and you would have another dose for a much more 6 serious symptoms. 7 Q Okay. 8 A So I do not -- To answer your question, I do 9 not know what was the dose, the minimum dose necessary to 10 cause the most minor of the symptoms and what was the dose 11 necessary to cause the most serious complication in these 12 people. It is certainly documented someplace. I do not 13 have it at the present time. 14 Q Have you read articles published by the United 15 States Environmental Protection Agency with respect to 16 Yusho poisoning? 17 A Yes. 18 Q Have you read articles which indicate that the 19 toxicity threshold dose for the induction of disease in the 20 Yusho incident was .6 milligrams of furans? 21 A I would have to see that to assure myself if 22 that's what I read. 23 Q But you can't state that today? 24 A I cannot state that today. 25 Q Would you calculate how many, how many times	Page 51 1 one, and I'm following up on that so that the doctor can 2 put this in terms that the jury will understand. 3 (By Mr. McCrea) Now, Doctor, if there are 50,000 4 milligrams in an ounce or if there -- Your calculation is 5 that .6 milligrams goes into an ounce 50,000 times. Is 6 that correct? 7 A That's correct. 8 Q So if .6 milligrams is the toxicity threshold 9 dose to induce disease in the Yusho victims that means, 10 does it not, that one ounce of furans would be sufficient 11 to induce disease in 50,000 people? 12 MR. CARNEY: Well, let me object. 13 A No. 14 MR. CARNEY: Let me just make an objection. 15 You're asking him to assume something that he's already 16 indicated he can't assume. You're reading from an article 17 obviously. You won't show him what you're reading from 18 and -- 19 MR. McCREA: He already read it. 20 MR. CARNEY: Well, you haven't been able to 21 identify it as to where did it come from, who's the author, 22 how many pages there are in it. 23 MR. McCREA: It came from the U.S. EPA. The 24 title is Health Effects of PCB and PCDF Mixtures", Section 25 IV, page 13. There's no secret.
Page 50 1 .6 milligrams goes into an ounce? 2 A Well, let's see. Again we're having the zeros 3 problem. There are 30 milligrams in an ounce, 30 grams in 4 an ounce. That means there are 30 times 1,000 milligrams, 5 so that's 30,000 milligrams and 6/10 goes into that 50,000 6 times. 7 Q If there is data that indicates the furan 8 toxicity threshold dose which induced the disease in Yusho 9 was .6 milligrams for furans, would that then indicate that 10 one ounce of furans would be sufficient to induce the 11 disease in 50,000 people? 12 MR. CARNEY: Well, I'm going to object to 13 that. It's a hypothetical question. You're asking him to 14 try to do some very complex mathematical equations and I 15 think, you know, that's something you can calculate. To 16 have him do that in a matter of minutes here, I think it's 17 a waste of time. If you want to make those calculations 18 and do those calculations, I just don't think that's the 19 proper place for it. 20 MR. McCREA: Tom, I'm just taking your lead 21 because your asked, and I think appropriately so, that the 22 doctor express this in quarts and pints, and I think most 23 of the people on the jury understand how many ounces there 24 are in a pint, how many ounces there are in a quart. So I 25 just quite frankly think that your suggestion was a good	Page 52 1 MR. CARNEY: Well, there's a secret as to what 2 is on the pages before that and what are the pages, what's 3 on the pages after that, who the author is, what the date 4 of the article is. You've ripped out one page of an 5 article or a document that we can't identify, the witness 6 can't, and now you're asking him to assume something in 7 this unidentified piece of paper. I think it's improper. 8 I object. 9 Q (By Mr. McCrea) All right. You may answer 10 the question. 11 A Well, I said no because you have not included 12 the chlorinated terphenyls in this. You have not told me 13 which type of chlorinated dibenzofurans there are. You 14 haven't talked to me about where, what percentage of 15 chlorination these furans have, where these chlorine 16 molecules are. The chlorine substitution in various places 17 can account for a toxicity range of a thousand parts, a 18 thousand to one. 19 Q Now, of course all that information is 20 interesting to you as the former medical director of 21 Monsanto; correct? 22 A Well, it's interesting. 23 Q Terphenyls, where the chlorine atoms attach to 24 the molecule, the different types of furan molecules. 25 That's of interest to you; correct?

Page 53 1 A It was interest to me when you were quoting 2 dibenzofurans and you are not saying which one it is 3 because unless I would know which one it is and be able to 4 look up the toxicity of the individual isomer, I wouldn't 5 be able to answer your question. 6 Q Have you done any work to determine that very 7 information which you find of interest? 8 MR. CARNEY: In answering your question just a 9 few minutes ago? 10 MR. McCREA: No, before he came to this 11 deposition. 12 MR. CARNEY: Well, you asked a specific 13 question and he was trying to answer your question, 14 said he needed to know some additional facts in order to 15 answer your question. 16 MR. McCREA: Yeah. I'm just wondering as the 17 former medical director and as the individual testifying on 18 your behalf if this information which he has said he would 19 like to know before he can answer the question has been 20 studied by him before coming to this deposition and if it 21 hasn't, it hasn't. If it has, it has. 22 A When you state -- Was that a question? Have 23 you asked me a question? 24 MR. McCREA: Not really, not really. 25 A I'm waiting for the question.	Page 55 1 than furans? 2 A Yes. 3 MR. CARNEY: Which type of furans are you 4 talking about? Again he said there were seven different 5 types. 6 Q (By Mr. McCrea) Golly, this gets confusing, 7 doesn't it? How many different types of dioxins are there, 8 109? 9 A 125, I think. 10 Q 125. Now, you're not specifying which 11 congener of dioxin in giving us the answer that dioxins are 12 more toxic than furans. You're stating that dioxins are 13 more toxic than furans; correct? 14 A It's a general rule that dioxins are more 15 toxic than furans, but when you asked me about, talking 16 about figures as far as the toxicity of a furan of the 17 chlorinated furans, I'm afraid you'll have to specify the 18 ones because I cannot answer a blanket question as far as 19 individual ones. 20 If you compare dioxins with dibenzofurans, that's 21 fine, but if you're asking me a question about the toxicity 22 of a general class of chlorinated dibenzofurans, it will be 23 impossible for me to give you the answer unless you give me 24 which one you're talking about. 25 Q There are certain dioxin molecules that are
Page 54 1 Q (By Mr. McCrea) All right. So Doctor, furans 2 are toxic; correct? 3 A Let's be precise. Chlorinated furans are 4 toxic. 5 Q Are enormously toxic? 6 A Depends again on the substitution, where the 7 chlorines are added to the benzene molecule, atom molecule. 8 Q They were toxic in Japan? 9 A The ones that were there, yes. Now, there are 10 other chlorinated dibenzofurans that can be much less toxic 11 by a factor of a thousand. 12 Q What studies did you read that established 13 that? 14 A I can't quote them to you right now, but 15 they're certainly established in the literature. 16 Q Now, are dioxins more toxic than furans? 17 A Yes, somewhat more. 18 Q By a magnitude of what? 19 A I don't think it's ten times as much. They're 20 somewhat more toxic, but not all that much more toxic. 21 Q Approximately what, three to ten times more 22 toxic? 23 A I can't answer that because those absolute 24 figures have really not been established particularly. 25 Q It is your opinion that dioxins are more toxic	Page 56 1 more toxic than other dioxin molecules? 2 A That is correct. 3 Q There are certain furan molecules that are 4 more toxic than other furan molecules? 5 A That's correct. 6 Q There are certain polychlorinated biphenyls 7 that are more toxic than other PCB molecules? 8 A Yes. Now, remember you're bringing in PCBs in 9 the same ballpark as dioxins and dibenzofurans, so... 10 Q PC furans are more toxic than PCBs as a 11 category? 12 A Yes, much more. 13 Q Much more? 14 A Yes. 15 Q How much more as a category? 16 A 10,000 to pick a figure. 17 Q Okay. And dioxins are more toxic than furans 18 as a category? 19 A As a what? 20 Q As a category. 21 A Yes. 22 Q How much more toxic? 23 A I can't answer that. I'd have to assume, but 24 it's not 10,000 times or anything like that. 25 Q How many more?

Page 57 1 A I'd have to assume. If you want an 2 assumption, I'll give you an assumption. 3 Q Fair enough. 4 A Ten to a hundred. 5 Q Thank you. Has this relative toxicity ever 6 been expressed in writing by Monsanto? 7 A I haven't seen it if it has. 8 Q Have you had conversations with Monsanto 9 personnel in which you informed them of the relative 10 toxicity of furans to PCBs and dioxins to furans? 11 MR. CARNEY: You talking about prior to his 12 retirement? 13 MR. McCREA: No, up to this date. 14 A I've had times when they informed me about it. 15 Q (By Mr. McCrea) So they know that? 16 A Some people know it, yes. 17 Q In Monsanto? 18 A In Monsanto, yes. 19 Q What are the by-products of the combustion of 20 PCBs? 21 A Chlorine, soot. It depends again. Now, what 22 temperature are we talking about. 23 Q Let's have three categories of temperature. 24 Let's have 240 degrees Fahrenheit, 800 degrees Fahrenheit 25 and 2,000 degrees Fahrenheit?	Page 59 1 the furans are destroyed. 2 Q Okay. 3 A All fires are not alike obviously. If we're 4 talking about laboratory combustion, we've got one thing. 5 If we're talking about fire in a building, we've got 6 something else. 7 Q Why is that? 8 A Because everything changes. There are various 9 temperatures at various areas of the fire. 10 Q I'm sorry. I didn't understand that? 11 A Well, there are various temperatures in 12 various areas of the fire. 13 Q So in a laboratory it would be -- What would 14 the difference be between a laboratory fire and a building 15 fire? 16 A You can control what temperature range that 17 you want in a laboratory. You cannot control it in a 18 building. 19 Q Okay. Are there any other by-products from 20 the combustion of PCBs other than furans at this window 21 range of 600 to 900 degrees Fahrenheit? 22 A Oh, yes. As I said, there's carbon dioxide. 23 There may very well be carbon monoxide. There's carbon. 24 There's chlorine that's knocked off. Whether there are 25 hydrochloric fumes or not, I don't know. I'm not sure.
Page 58 1 A Okay. At 2,000 degrees it's all, the material 2 is burned up. 3 Q It turns into carbon dioxide? 4 A Carbon dioxide, carbon, soot, carbon monoxide. 5 Q Carbon monoxide? 6 A Could be. 7 Q That wouldn't be good for you, would it? 8 A In a fire, I don't think anything is good for 9 you at 2,000 degrees. 10 Q All right. 11 A There is a window at which dibenzofurans are 12 formed, and that window is something around six or 700 13 degrees Fahrenheit. 200 degrees higher than that it is, 14 the furans are destroyed. So there's a two or 300 degree 15 window at which furans are formed. Getting down to the 16 lower ones, you said a lower temperature? 17 Q 240 degrees Fahrenheit is what I picked. 18 A Huh? 19 Q Yes, 200 -- All right. Furans are formed from 20 the combustion of PCBs at 600 to 700 degrees Fahrenheit? 21 A Well, I'm not sure of the exact -- It's around 22 that area, and it might be a larger window. It might be 23 700 to 900, 600 to 850. I can't tell you, but there's a 24 certain time in the combustion that furans are formed and a 25 certain time in the combustion that it gets hot enough that	Page 60 1 Q What about biphenyls? 2 A They may be. I don't know. 3 Q What about quaterphenyls? 4 A I don't know about that. 5 Q Okay. How long have you known that furans are 6 produced in the window range of 600 to 900 degrees 7 Fahrenheit by the combustion of PCBs? 8 A Six to eight years, I suppose. 9 Q How did you learn that? 10 A I was told by chemists at Monsanto. 11 Q Who was the chemist who told you? 12 A It may have been Dr. Robert Kaley, K-a-l-e-y. 13 Q What did he tell you? 14 A Told me just that. He told me that there is a 15 window that furans are formed, and after you exceed that 16 window, a higher temperature, the furans are destroyed. 17 Q So you learned that information about 1982 to 18 '84? 19 A Well, I can't be that precise. I've seen Dr. 20 Kaley off and on the last ten years, so I don't know what 21 he told me. 22 Q Did he prepare a paper on that? 23 A I don't know. 24 Q Where does he work now? 25 A At Monsanto, St. Louis, Missouri.

Page 61 1 Q Are you pretty sure it was him? 2 A No, I'm not sure it was him, but it might very 3 well have been him. 4 Q Did he show you a document or did he just 5 verbally communicate? 6 A It was verbally communicated. 7 Q And what did he tell you? 8 A I don't have the precise words, but he told me 9 that -- I had asked him about combustion products of the 10 PCBs, and he told me. 11 Q Did Monsanto communicate this information to 12 people to whom they had sold PCBs? 13 MR. CARNEY: I'm going to object here. I 14 think we've established that Dr. Kelly learned this after, 15 long after he's retired from Monsanto, and I don't think 16 there's any foundation that he would know that. 17 Q (By Mr. McCrea) There may not be. Do you 18 know if Monsanto communicated the information which you 19 think was given to you by Dr. Robert Kaley that furans are 20 produced by the combustion of PCBs at the window of 600 to 21 900 degrees Fahrenheit, did they give that information to 22 the customers? 23 A I don't know. 24 Q Would you have given it to the customers if 25 you'd have been with Monsanto?	Page 63 1 Q Well, that was not something that was tested 2 in a laboratory? 3 A I don't know. 4 Q At Monsanto? 5 A I don't know, but you asked me how long he 6 worked on it. 7 Q Did he tell you what the source of this 8 information was? 9 A No, he didn't. 10 Q Do you know if there was an experiment done by 11 Monsanto? 12 A I don't know. 13 Q So he would be the best one to ask? 14 A You mean ask about -- 15 Q Dr. Kaley? 16 A I don't know who else. There may be other 17 people more knowledgeable than he is. You asked me who 18 told me, and I said to the best of my recollection it was 19 Dr. Kaley. 20 Q Now, Dr. Kelly, do you know of any other 21 by-products from the burning of PCBs other than furans 22 which are toxic? 23 A Well, chlorine is toxic. 24 Q All right. Any others? 25 A There may be others. I mean, I don't know at
Page 62 1 A I think that would depend on the customer. 2 That would depend on the knowledge the customer had. That 3 would depend on the amount of material that was in the 4 literature. That would depend upon whether any fires had 5 occurred because -- 6 Q What if fires might occur? 7 A Well, fires really hadn't occurred until 8 sometime around the mid '70s. 9 Q Would there be any reason not to give that to 10 your customers? 11 A No, that I can think of, unless I knew the 12 customers knew it themselves. 13 Q Do you know of any customers that have 14 conducted tests determining the production of furans from 15 the combustion of PCBs? 16 A No, but there have been government 17 publications relative to that. 18 Q Okay. How long did Dr. Robert Kaley work on 19 this experiment or scientific test where he determined that 20 furans were the by-product of the burning of PCBs at 600 21 and 900 degrees Fahrenheit or whatever? 22 A I never said he worked on it. I never said he 23 did any experiments. I do not know the basis for his 24 knowledge. I never said he worked on it. I never said he 25 did experiments.	Page 64 1 the present time. Hydrochloric acid, I believe, is 2 liberated. 3 Q Have you ever done any studies on the content 4 of by-products in failed capacitors? 5 A What do you mean by a study? 6 Q Laboratory, analytical work measuring the 7 chemicals formed as a result of the failure of the 8 capacitor? 9 A No, sir, I have not. 10 Q Do you know of any studies at Monsanto? 11 A I do not know. 12 Q Do you know of any studies at Monsanto which 13 have tested the content of transformer fluid in a failed 14 PCB transformer? 15 A I do not know of any studies. There may be 16 some I do not know of. 17 Q When Dr. Kaley had this conversation with you 18 as you recall, did you communicate that information that he 19 gave you to anyone? 20 A I don't know if I did or not. You mean did I 21 communicate this with anybody at Monsanto? No. I think he 22 gave it to me for my own information or I asked him for it 23 for my own information. I don't know how the topic arose. 24 Q Did you use it in any cases in which you were 25 testifying as a fact, as an expert fact witness on behalf

Page 65 1 of Monsanto? 2 A I don't think so. I did not, have not 3 testified in any cases where there were fires. 4 Q Did you have PCB fires in the plant at Sauget? 5 A If they had it, they certainly were not major 6 fires. 7 Q Did you have PCB fires in the plant at 8 Anniston? 9 A I never heard of any. 10 Q Did you know of any customers who had PCB 11 fires within their plants? 12 A No, I did not. 13 Q Do you know of any customers who had fires 14 resulting from the heat transfer fluid being under pressure 15 and heated and then burning within a plant? 16 A You mean the heat transfer -- 17 Q Therminol. 18 A -- fluid being a PCB. 19 Q Therminol. 20 A I do not know of any. There may have. I 21 don't know of any. 22 Q Can you describe for us the manufacturing 23 process at Bloomington, Indiana in the Westinghouse 24 capacitor plant? 25 A I can't at all. I have never been in	Page 67 1 Q Dr. Kelly, if you learned that a toxicological 2 study paid for by Monsanto was false and fraudulent and you 3 were the only person who knew that the toxicological study 4 paid for by Monsanto was false and fraudulent, would you 5 communicate that information to the United States 6 Government and former customers who've purchased your PCBs? 7 MR. CARNEY: Let me object to the question. I 8 think it's fraudulent if you don't give a time frame. 9 You're making this witness speculate about what he might do 10 under some circumstances where there's no foundation. 11 A Well, in the first place I never learned that. 12 Q (By Mr. McCrea) That wasn't the question. 13 A Wasn't it? 14 Q The question was -- It didn't have anything to 15 do with which you learned. Do you now know there was false 16 and fraudulent -- 17 A No. 18 Q I'm just asking you the question. 19 A Would you repeat the question? 20 MR. McCREA: Could the court reporter read the 21 question back, please? 22 (Thereupon, the reporter propounded the previous 23 question.) 24 A Are you talking now? 25 MR. CARNEY: Before you clarify it, let me
Page 66 1 Bloomington, in the Westinghouse plant at Bloomington, so I 2 cannot. 3 Q Do you know of any Monsanto personnel who were 4 in that plant? 5 A I do not know. 6 Q And observed the plant operation? 7 A I do not know of any. 8 Q Dr. Kelly, if you received information today 9 at Monsanto that only Monsanto had and that information 10 indicated that PCBs caused a particular health problem and 11 nobody else in the world had that information, would you 12 give it to the government? 13 A Yes, I would. 14 Q Would you give it do the workers? 15 A Yes. 16 Q Would you give it to your former customers who 17 bought PCBs? 18 A Yes. 19 Q Why would you do that? 20 A Because if your assumption were true -- we're 21 assuming that this is a fact -- I would not want the 22 condition to be repeated. I would want to be sure that the 23 people were following the safe handling procedures that we 24 had outlined, and we'd want to correct it, correct their 25 method of handling the product.	Page 68 1 make a further objection to the question. I think you 2 haven't given enough facts here or hypothetical facts to 3 have anybody give a reasonable answer. If there was a -- 4 You haven't said what in this fraudulent study was 5 fraudulent, whether it would impact anything about the 6 study or would it make any difference in the study. 7 It seems to me if there was some mistake in a study 8 but it made no difference in the conclusion of the study, 9 that might be one thing. If it would impact the toxicity 10 of the substance that was being tested and would change the 11 substance, that might be another. I think you've got to 12 give more facts than just there's some study and there's 13 something fraudulent in a study without identifying more 14 facts so that somebody could answer. 15 And also, I object that the question is compound. 16 You asked about would he give this information to the 17 government, would he give it to customers, and that would 18 make a difference as to which you're talking about. 19 Q (By Mr. McCrea) You may answer. 20 A Well, would you clarify your last phrase in 21 that when you brought in PCBs? Up to that whole question 22 you never mentioned PCBs until right at the end, and I'd 23 like to know are you referring to a toxicological study on 24 PCBs and if that were false? Well, you -- 25 Q Any study.

Page 69 1 A Well, you mentioned PCBs in it. 2 Q Well, let's restrict it to PCBs. 3 A All right. Now -- 4 MR. CARNEY: But you haven't -- Would you tell 5 him whether the, in the hypothetical you're giving him 6 whether the mistake or the fraud had any impact on the 7 state of the knowledge about the toxicity? If it was 8 irrelevant, then why would you want to tell anybody? If it 9 was material and changed the, materially the information 10 about the toxicity of the PCB, if you're using that in this 11 instance, that would be another thing. 12 Q (By Mr. McCrea) Okay. First of all, Dr. 13 Kelly, if the study was false and fraudulent and it had 14 absolutely no impact on the toxicity of the chemical and 15 its impact on the environment or humans, would you give 16 that information to the United States Government that it 17 was false and fraudulent? 18 A Well, that is an impossible question for me to 19 answer. Here is a study that we are running that is false 20 and fraudulent and has no impact on anything? 21 Q Right. 22 A How do we know it's false and fraudulent then? 23 Why are we running it? If we would be trying to get some 24 information, well, if we couldn't depend on the information 25 and even if the information were wrong, it would have no	Page 71 1 or X thousand dollars from this insurance company, X 2 thousand dollars. The name of Brown versus Monsanto or 3 Jones versus Monsanto or Smith versus Monsanto would not be 4 on my tax return. 5 MR. McCREA: To save time, Counsel, can we 6 have a stipulation that you will provide us the names by 7 cause number, plaintiff, defendant, court, city in which 8 doctor, in which the doctor has testified so that we don't 9 have to pursue this matter and take any more time in this 10 deposition? 11 MR. CARNEY: Well, you know, all I'm saying is 12 I don't have a list and -- 13 MR. McCREA: Well, Monsanto surely does. 14 MR. CARNEY: And as far as I know Monsanto 15 doesn't. I'll can them if they have a list, but Dr. Kelly 16 said yesterday that he didn't have a list. He's given you 17 in search of his memory yesterday as to all the cases he 18 can think of, so I don't know that I can add anything 19 because I don't have any independent knowledge of any cases 20 other than the ones he's mentioned. I didn't know most of 21 those until he mentioned them. 22 MR. McCREA: Will you contact Monsanto and ask 23 them for the names of the cases, cause number, court, city, 24 in which Dr. Kelly has testified and provide that to us so 25 we can move on with this deposition?
Page 70 1 impact on the toxicity. I can't answer a question like 2 that. 3 Q Now, if the study was false and fraudulent and 4 it did impact on the results, in other words, the falsity 5 and the fraud indicated that it was not toxic and the true 6 test results would show it was highly toxic, would you 7 communicate that information to the government and your 8 former customers who bought the product? 9 MR. CARNEY: Again we're talking about 10 something hypothetical that has no relationship to facts as 11 they occurred, but you can try to answer. 12 A Well, certainly if it impacted on material 13 that we had given people before, we would certainly correct 14 that. 15 Q (By Mr. McCrea) Okay. Dr. Kelly, yesterday 16 you mentioned that you did not recall the names of the 17 cases in which you had given testimony. 18 A All the cases, yes, sir. 19 Q I understand that. But you also mentioned 20 that that information would be on your tax returns. Is 21 that correct? 22 A No, it wouldn't be. 23 Q Well, I thought that what your testimony. 24 A I guess that was a bit of humor. I would 25 write down I received X thousand dollars from this lawyer	Page 72 1 MR. CARNEY: I'll contact Monsanto. I don't 2 know that they have the information. 3 Q (By Mr. McCrea) Thank you. Dr. Kelly, 4 yesterday you reviewed a number of animal studies in which 5 the toxicological properties of PCBs and other chemicals 6 were investigated. Is that correct? 7 A That's correct. 8 MR. McCREA: Counsel, do you have those 9 studies with you today? 10 MR. CARNEY: I'm sorry. Which studies? 11 MR. McCREA: The exhibits. 12 MR. CARNEY: Yeah, I've got all the exhibits 13 that were used yesterday. 14 Q (By Mr. McCrea) All right. Now, what I would 15 like to ask you, Dr. Kelly, is this: Would you go through 16 those studies and identify all of the studies by exhibit 17 number only in which Monsanto paid for the entire study? 18 Just a second. 19 Then would you go through the studies and identify 20 by exhibit number only those studies that Monsanto paid 21 partially for, and then thirdly, the studies in which 22 Monsanto paid no money. And I see no reason to continue 23 with the video camera while you do that, but what I would 24 like to know, are all of those studies which were paid for 25 by Monsanto in whole or in part. Fair enough?

Page 73 1 A I will tell you and save you a lot of time, 2 all the studies of Industrial Bio-Test that I saw were paid 3 for wholly by Monsanto. All the studies at Younger 4 Laboratory were paid for by Monsanto. All the studies of 5 Scientific Associates were paid for by Monsanto. 6 Q All right, sir. 7 MR. CARNEY: I think the testimony was that 8 Monsanto requested all those studies, as I recall, at least 9 of all those names, and that was the bulk of the studies. 10 Q (By Mr. McCrea) All right. Then maybe it 11 would be easier to identify the studies that were not paid 12 for by Monsanto. Now, do you know, for instance, if the 13 study that was carried out on the workers who had chloracne 14 at Anniston, Alabama by Dr. Jones in Atlanta was paid for 15 by Monsanto? 16 A Certainly whether it was paid for -- The 17 treatment of the workers was paid for by either the 18 insurance, not by Monsanto. It was the insurance company 19 that insured Swann or the insurance company that, of Swan 20 Chemical themselves. Writing a paper, the scientific paper 21 is never paid for by outside people. The man writes it 22 himself, a scientific medical paper. 23 Q All right. That answers my question. 24 A Okay. 25 Q So in that situation, as I understand it,	Page 75 1 Q Would you identify any other articles in the 2 stack that were not Industrial Bio-Test, Younger or 3 Scientific Associates? 4 A Yes, the von Oettingen which was in 5 the Westinghouse file. I don't know who paid for that. 6 Monsanto didn't pay it. 7 Q He was contracted with Westinghouse? 8 A I can't answer that. 9 Q All right. So you don't know? 10 A I don't know. 11 Q All right, sir. Now, what I need, just 12 because it may be six months before we review this 13 material, I need the exhibit numbers if we could. 14 MR. CARNEY: You want to -- I'll have somebody 15 find that if you want to go on, and we'll just read it into 16 the record within the next five minutes. 17 MR. McCREA: That's fine. 18 MR. CARNEY: So we can save some time. 19 Q (By Mr. McCrea) That's agreeable. Doctor, 20 you made reference yesterday to the term systemic poison. 21 What do you mean? 22 A Systemic poison is something that affects the 23 body metabolism. It is something apart from local action. 24 In other words, if you spill an acid on your arm, you will 25 get an acid burn. That's a local reaction. If you take a
Page 74 1 these workers who worked for Swann -- Am I correct? 2 A Correct. 3 Q Developed chloracne? 4 A Correct. 5 Q They then would have been sent to the doctor 6 at the expense of Swann? 7 A Yes. 8 Q The doctor then treated them medically. He's 9 paid for by Swann? 10 A That's correct. 11 Q And then ultimately he writes a paper which is 12 on his own time? 13 A That's correct. 14 Q All right, sir. Now, in that particular 15 situation, was the examination that was carried out by the 16 two doctors in Atlanta done at a point in time before 17 ownership by Monsanto or was the examination after 18 ownership by Monsanto? 19 A It was before. 20 Q All right. Thank you. Now, are there -- What 21 I would like to have at this point since you've saved us a 22 lot of time by stating that Industrial Bio-Test, Younger 23 and Scientific Associates were paid for 100 percent by 24 Monsanto. 25 A That's correct.	Page 76 1 poison internally, you will get a systemic action. If you 2 swallow the acid, you could get a local death of tissue. 3 That would be local, on the stomach or the esophagus which 4 is the gullet. 5 Q Are PCBs which get on your skin categorized as 6 something involving local action or something involving the 7 body metabolism? 8 A It depends on how much you get on, how often 9 you get on, how long you leave it on. It does have a local 10 action on the skin similar to mild paint remover or 11 something like that. If you get enough of it on your skin 12 for a long enough period of time and repeat it enough 13 times, you will get systemic action. 14 Q How do you get systemic action from a PCB 15 which makes contact with the outer portion of your skin? 16 A It penetrates the skin. It's absorbed. 17 Q How does it penetrate the skin? How does it 18 get through the skin barrier? 19 A It's oil soluble. 20 Q If you had ten milligrams of PCB on your skin 21 and you left it there for 24 hours, how much of that would 22 go through your skin? 23 A I don't know, but it wouldn't hurt you, not 24 enough to go through to hurt you. 25 Q Okay. You don't know the percentage that goes

Page 77 1 through? 2 A No, I don't. 3 Q How long have you known that PCBs which come 4 in contact with the skin can penetrate the skin and if in 5 sufficient quantity, can work as a systemic poison? 6 A Now, again we have to define systemic 7 poisoning because systemic poisoning means all different 8 things to various people. I know that I have known for 30 9 years that if you get PCBs on your skin in a sufficient 10 amount and leave it on there you will get chloracne. I 11 have known that. Now, if by -- 12 Q And excuse me, Doctor. Is that the result of 13 a systemic action? 14 A Yes, chloracne is. It's a skin manifestation 15 of a systemic action. 16 Q It's not a local contact dermatitis? 17 A No, it's -- 18 Q It means that the chloracne problem is caused 19 by something happening within the body? 20 A That's correct. 21 Q Excuse me for interrupting you. If you would 22 continue. 23 A Where was I? 24 Q Well, we, you were talking about you have 25 known for 30 years that if PCBs got on the skin in	Page 79 1 part of your body that is immune from the effects? 2 A Well, certainly. I mean, I think you have to 3 tell me by, what you mean by immune. Do you mean does it 4 affect your eyes and ears, brain, brain? 5 Q Yeah, not subject to injury. 6 A Well, a systemic toxic agent has -- 7 MR. CARNEY: We're out of tape, so we'll have 8 to come back to that. 9 MR. McCREA: We'll come back to that. I'm 10 sorry. 11 (Thereupon, a short recess was taken.) 12 Q (By Mr. McCrea) Dr. Kelly, I would like to 13 discuss Exhibit K-6 with you. 14 A Yes, sir. 15 Q Do you have a copy of that? 16 A I have a copy. 17 Q All right, sir. And that also has on the 18 bottom of the page the identifying letters and numbers 19 GBRN001998; correct? 20 A Yes, sir. 21 Q Did you author this document? 22 A Yes, I dictated it. 23 Q And this is a copy from the files of Monsanto, 24 a carbon copy? 25 A Yes.
Page 78 1 sufficient quantity, it could cause chloracne, and that's 2 when I asked you if chloracne was a systemic manifestation. 3 We have two minutes left. 4 A Okay. And I know also, I've known for quite 5 some time that in rabbits, in rats, if you put a sufficient 6 amount on and repeated it, you can get systemic poisoning 7 in other parts of the body. You could get liver problems. 8 That I haven't known as long. 9 Q How long have you known that? 10 A Well, we did that repeated work at Bio-Test in 11 1972. 12 Q Okay. 13 A In rabbits. 14 Q All right, sir. And that showed what? 15 A That showed in rabbits that you could get a 16 sufficient amount through. That's not human skin, though. 17 Q To do what? 18 A To cause liver problems. 19 Q What kind of liver problems? 20 A A swelling of the liver and in sufficient 21 doses, eventual death of the animal. 22 Q One minute. Anything else that you'd like to 23 add to the discussion of systemic poisons? 24 A No, no. 25 Q When you have a systemic poison, is there any	Page 80 1 Q It does not have a signature? 2 A Beg your pardon? 3 Q It does not have a signature? 4 A No, it's a carbon copy. I only sign the 5 letter that's going out. 6 Q Did you know Dr. J. Clarence Davies, III, 7 Senior -- 8 A No, I didn't. I did not. 9 Q This letter was written May 10, 1972; correct? 10 A Yes, sir. 11 Q Did Dr. Davies make inquiry of you before May 12 10, 1972? 13 A I don't know if he did, but somebody must have 14 wanted this information. I don't know why, the particular 15 reason I sent it to Davies. Conceivably he talked to me or 16 somebody talked to me and said, "Send this to Davies," or I 17 may have decided on my own and Davies may have had some 18 contact with us. I don't know. 19 Q Did you have any follow-up communication with 20 Dr. Davies other than the May 10, '72 letter? 21 A Not that I can recollect. 22 Q At the top it says, "cc: Dr. Richard Osland." 23 Who is that gentlemen? 24 A The plant physician at East St. Louis. 25 Q East St. Louis is the same at Sauget?

Page 81 1 A Yes. I used East St. Louis because very few 2 people know where Sauget is. We had always called it East 3 St. Louis, but Sauget is the technical geographical name. 4 Q In the first paragraph you refer to it as 5 Sauget or Sauget, Illinois plant? 6 A That's correct. 7 Q And whenever you refer to East St. Louis in 8 your testimony, that would be the same as Sauget? 9 A That is correct. 10 Q One and the same? 11 A One and the same. 12 Q Who were the people on your medical staff who 13 examined the hourly and salaried workers? 14 A Myself and the technician I took along to draw 15 the blood. 16 Q Just two of you? 17 A Yes. 18 Q Can you give me the technician's name? 19 A Oh, no, I can't. 18 years ago? I don't 20 remember. 21 Q Can you describe for me the protocol which you 22 use for the examinations? 23 A Yes. I call these 27 people in one at a time 24 over a period of -- I don't know how many different days I 25 was there, and sat them down in the examining room and	Page 83 1 write it down here. 2 Q Where are the forms which you used when you 3 conducted these examinations in 1972? 4 A There are the forms we used for the people in 5 the Sauget plant, and they were placed in the Sauget plant 6 file at the end of the examination. 7 Q Where -- 8 A I mean, after I received all the blood work 9 back. 10 Q Where are they today? 11 A I haven't the slightest idea. 12 Q When was the last time you saw the forms in 13 the files relating to these examinations? 14 A I don't know if I saw them in the files. I 15 sent them back to East St. Louis after I received the 16 laboratory data and the PCB analysis. I wrote that on 17 there and sent it back, so it must have been the last time 18 I saw the forms was sometime in May of '72 or April. It 19 all depends on how fast -- Well, I had them, yes. I mean, 20 it must have been sometime in May of '72. 21 Q In preparing for this deposition, did you ask 22 Monsanto if they still had those forms on file? 23 A No, I did not. 24 Q How many of the 27 were salaried workers? 25 A I don't know. I don't know for certain, but I
Page 82 1 talked to them, got a medical history from them, got an 2 industrial history, industrial history being what they did, 3 what exposures they had. 4 Then I ran through the usual systemic list of 5 symptoms, cardiovascular system, the pulmonary symptom, the 6 neurological system, asked them whether they had been 7 hospitalized, whether they had any recent or not so recent 8 visits to the doctor, whether they had lost any time. 9 Then I proceeded to examine them. I carried out a 10 complete examination. The usual clinical examination 11 starts with observing a person when he walks in. Then you 12 have him take off his clothes to the waist. You look at 13 his eyes, ears, nose, throat, ears. You look at his skin, 14 especially the face and ears and neck because that's where 15 chloracne starts. 16 You examine the heart and the lungs. You have them 17 lie down on a table and feel his abdomen to see if there 18 are any enlargement of any of the organs or any tumors or 19 any masses. Then you, along the way you've checked his 20 blood pressure someplace, listened to his heart, listened 21 to his lungs. 22 Then you do a neurological examination on him and 23 run a battery of laboratory tests. I don't see I've 24 written down anything about the EKG or chest x-ray. I 25 thought I did them. I may very well have, but I didn't	Page 84 1 would probably say no more than three or four. 2 Q Did 27 -- Were 27 people the total number of 3 people involved in the manufacture of PCBs? 4 A At the Sauget plant, yes. I believe I got all 5 of them. I mean, I can't say that there may not have been, 6 I missed one or two, but I thought I got all the people 7 that were working at that time. 8 Q 16 had no detectable PCBs; correct? 9 A That's correct. 10 Q And two -- Let's see -- Six had levels of 11 200 parts per billion to 500 parts per billion; correct? 12 A That's correct. 13 Q So you had six people in the range of 200 to 14 500 parts per billion? 15 A That's correct. 16 Q What was the background level at that point in 17 time in the United States? 18 A I don't know. I don't know if it was 19 established. 20 Q Did you consider 200 to 500 parts per billion 21 as high? 22 A No. 23 Q Do you consider it as high today? 24 A Yes. You recognize that I had said in my 25 testimony yesterday that laboratory sensitivities have

Page 85 1 changed a great deal from 1972 for the next ten years. 2 They were much more precise and much more confident of 3 their results. 4 Q But that wouldn't change the information as to 5 200 to 500 parts per billion being high or low. It would 6 simply affect the accuracy of the numbers? 7 A Well, if the numbers weren't accurate, it 8 would sure change whether it was high or low, I mean -- 9 Q But -- 10 A I'm not as confident in the numbers today as I 11 was in 1972. We were doing the best we could at that time, 12 but since then we have found out that we are much more 13 precise, much more sensitive and we're much more confident 14 about the results, but it was the best we had in 1972 and I 15 found out that 16 didn't have any and two of them had four 16 parts -- 400 parts per billion and one had 500 parts per 17 billion. 18 Q Six people between two and 500 parts per 19 billion? 20 A That is right. 21 Q But you had no idea as to whether or not that 22 was a high number, the 200 to 500 parts per billion? 23 A No, sir, I can't say that. I may have -- 24 There may have been some background that I knew about. I 25 don't know. I don't know that.	Page 87 1 Q (By Mr. McCrea) All right. Putting that 2 aside, based on your experience, your reading about PCBs, 3 your knowledge of PCBs, can you tell the jury how, what 4 quantity of PCBs you would expect to find in the individual 5 who had 500 parts per billion in his blood, what quantity 6 you would expect to find in his fat? 7 A I wouldn't be able to tell because it depends 8 whether he had a recent exposure to PCB that gave him in 9 his blood and had not gone into his fat. 10 Q Okay. Now, obviously you had some people here 11 who had PCB exposure. 12 A Yes, 27. 13 Q Well, by being PCB exposure by indicating the 14 levels in their blood? 15 A Well, they worked around PCBs. They were 16 exposed to them when they were working. 17 Q Did it concern you as the director of medicine 18 at Monsanto that PCBs were contaminating these individuals 19 at this level? 20 A I don't think I would have used the word 21 contaminated the people. I was not concerned. I was 22 concerned, too, because I checked over the individuals. 23 That's the reason I examined them, and I examined them and 24 found no clinical evidence of any illness, no evidence of 25 any PC poisoning, and I found these workers were as healthy
Page 86 1 Q Did you have any idea, Dr. Kelly, as to the 2 relative amount of PCBs in fat at that point in time if you 3 found 500 parts per billion in the blood? 4 A Yes. 5 Q How much more would you expect to have found 6 in the fat? You didn't test the fat? 7 A I think in an industrial environment, Mr. 8 McCrea, you do not tell the worker that we are going to 9 make a two inch incision in your skin and take out a couple 10 of grams of fat to analyze it. They don't look upon that 11 very enthusiastically. 12 Q Well, your company's done that to our clients? 13 MR. CARNEY: I object to that. That's 14 incorrect. 15 MR. McCREA: Well, sorry. It's absolutely 16 correct. 17 A Well, I am saying -- 18 MR. CARNEY: What he just described is 19 incorrect. We didn't do that to -- 20 A -- was my, at present time the analytical 21 methods are such that you can use a needle puncture and 22 bring out fat. In those days you had to take out at least 23 one or two teaspoonfuls of fat, so that necessitated a two 24 or two and a half inch incision in the abdomen and I didn't 25 see any reason to do that.	Page 88 1 as the people I examined every day when I examined people. 2 Q So it didn't concern you that you found these 3 levels in their blood? 4 A I did not think this was at all an alarming 5 statistic, no, sir. 6 Q There were no changes in the plant operation 7 to eliminate exposure after you found these levels? 8 A Remember we were not this sure of our results 9 on the PCB in blood. You are taking these as gospel, and I 10 have said all along that we were not certain about -- This 11 was the best we had, but we didn't know if it was good, 12 good enough, but I was much more interested in the state of 13 their health, their clinical health, their laboratory 14 findings which were all nothing unusual in there. So 15 that's what concerned me rather than these samples I took 16 of the blood, of their blood. 17 Q Dr. Kelly, after you found these levels in 18 their blood did, was there any effort by Monsanto to 19 eliminate the leaks of PCBs which obviously were getting 20 into these people? 21 A We always try to tighten up all operations. I 22 do not -- Remember you are just -- The answer is I do, I 23 think we looked over the housekeeping procedures, but you 24 are picking on the blood levels which I have repeatedly 25 said we are not confident that these represent actually

Page 89 1 what was in the people's blood. 2 Q It could have been much higher? 3 A It could have been much lower, too. 4 Q Right. The question is this, and would you 5 answer the question, please, and we'll get out of here much 6 earlier: Did you take any measures following this 7 collection of data to eliminate leaks of PCBs in the 8 Sauget, Illinois plant? 9 A We always -- The answer is we always tried to 10 eliminate leaks. Once we saw a leak, we eliminated it. 11 Q Did you have a number of leaks from time to 12 time? 13 A Well, in the chemical plant you do have leaks 14 certainly. 15 Q Doctor, when you examined these people in 16 1972, you knew about Yusho; correct? 17 A Yes, sir. 18 Q What health symptoms did you suspicion could 19 be caused by PCBs when you examined these people on May 10, 20 1972? And I'll ask you just to list them. 21 A Will you repeat that sentence? 22 Q What health problems did you suspicion could 23 be caused by PCBs when you examined these 27 workers on May 24 10, in the two months preceding your report on May 10, 25 1972? What I would like for you to do is simply to list	Page 91 1 be caused by exposure to PCBs. Is that correct? 2 A No, it isn't. It's a symptom that can occur, 3 and then after you find out -- After you examine the man, 4 you find out what is the cause of it. 5 Q Doctor -- 6 A Well, now just a moment. There are things 7 that have occurred in massive exposure to PCBs containing 8 dibenzofurans. I am suspicious of what that, those things, 9 what symptoms those might be, what symptoms and signs a 10 person might have. I have no preformed ideas of anybody, 11 what symptoms an industrial worker in our plant was liable 12 to have because I have known for 25 years that they didn't 13 have any symptoms. So I didn't know what to look for 14 except that I looked for all the symptoms that you would 15 look for if you were trying to pick up any illness. 16 Q Then, Doctor, it's important that you 17 understand my question. 18 A Well, yes, please. 19 Q If you don't understand my question and you 20 answer it not understanding it, then it's of no value. 21 A All right. 22 Q All right? On the date of May 10, 1972, you 23 have testified about your knowledge of furans. 24 A Yes, sir. 25 Q Did you have knowledge of furans on that date?
Page 90 1 all of those symptoms which you suspicioned might be caused 2 by PCBs? 3 MR. CARNEY: Well, I'm going to object to 4 having, using the word suspicion. Object to the form of 5 the question, and you changed the question now when you 6 talk about symptoms. I'm not sure what question you're 7 asking. 8 Q (By Mr. McCrea) Do you understand the 9 question? 10 A Well, I understand it, I believe. I will 11 answer it and see if I understand it. I recognize that if 12 individuals were exposed to PCBs that contained high levels 13 of nitrofurans or benzofurans and ate the material, certain 14 things would occur to them. I had no suspicion that we 15 would have any illnesses occur in our workers because we 16 had had none for 25 years or my experience was 38, 30 17 years. So I asked all the questions that you would ask an 18 individual who walked in. You asked him whether he had 19 lost weight, whether he had -- 20 Q Just a second. Can you go slower? 21 A Yes. 22 Q Lost weight? 23 A Yes. 24 Q All right. Is that -- Now, do we understand 25 each other? This is a symptom that you suspicioned might	Page 92 1 A I'm not sure. I'm really not sure of '72. I 2 may or not have. I'm not sure. 3 Q All right. I believe your testimony was that 4 you did. 5 MR. CARNEY: Well, I think you're 6 mischaracterizing. 7 Q (By Mr. McCrea) Just a second. And you're 8 stating now that you may or may not have? 9 MR. CARNEY: Well, I don't think you're -- I 10 don't think he's been inconsistent on that point. 11 Q (By Mr. McCrea) No, I'm not saying he has, 12 but it's important for me to know what your testimony is 13 and I was a little confused; all right? 14 A Well, I might very well have. I believe I 15 did, but I'm not certain. 16 Q All right, sir. Now my question is this: Did 17 you formulate as part of your medical protocol a list of 18 symptoms and/or health problems which you felt based upon 19 the literature, Yusho, whatever, might be caused by PCBs? 20 MR. CARNEY: I'll object to the form of the 21 question. I think it's ambiguous. 22 A Well, I'm trying to understand it, Mr. McCrea. 23 When you examine an individual -- Well, I have to do that 24 because I cannot answer your question yes or no. When 25 you're carrying out a medical examination, you ask the man

Page 93 1 for all symptoms he has, all symptoms you think he might 2 have. During the course of that you say, "Do you have 3 upset stomachs? Have you lost weight? Have you had any 4 skin problems?" I did not go in there with a list saying, 5 "Okay, we'll run down these nine things because they were 6 reported in Yusho." 7 Q That's exactly my question. 8 A But I was knowledgeable about Yusho. I was 9 knowledgeable about how to carry out a medical examination 10 and take a medical history, and that's what I did. 11 Q So I think you've answered my question. I'm 12 not sure, and as I understand your answer, it is this: You 13 did not prepare a list of symptoms which you then asked 14 these workers if they had, based upon your suspicion that 15 those symptoms might be caused by PCBs? 16 MR. CARNEY: I'm going to object to that 17 question. It's compound and contains -- 18 MR. McCREA: It's a little bit long. I'll 19 agree. Let me rephrase it, Tom. 20 MR. CARNEY: Okay. 21 Q (By Mr. McCrea) Did you prepare a list of 22 symptoms which you addressed to the workers? 23 MR. CARNEY: Are you talking about did he have 24 it in his head or did he have a list in his -- 25 MR. McCREA: No, written down.	Page 95 1 didn't have a list, what symptoms -- 2 A A written list, please. 3 Q Exactly, written list. What symptoms did you 4 suspicion that could be caused by PCBs? 5 MR. CARNEY: Again I'll object to the form, 6 the use of the word suspicion. 7 Q (By Mr. McCrea) You may answer. 8 A Well, there it can be caused by PCBs in what 9 exposure and in what amount? Here I am going over 10 examining workers and I am examining them to see if they 11 have any problems, any symptoms that are untoward, but that 12 would encompass any of the problems that had occurred in 13 the eating episode over in Yusho. 14 MR. McCREA: Well the court reporter read the 15 question back, and if I don't get an answer, I'm going to 16 take it to the Court. Now, I want an answer, Dr. Kelly. 17 A All right. Fine. 18 MR. CARNEY: Let me just object here. You're 19 insulting this witness totally without cause. He has sat 20 here for almost, well, a day and a half now asking 21 questions, answering questions very patiently and he's 22 answered, I think, every question to the best of his 23 ability including that particular question which is a very 24 vague and ambiguous question. He did a lot better job of 25 answering it than I think I could have done or anybody
Page 94 1 A No, I didn't go in there with a written down 2 list. I had a list of symptoms in my head that when I go 3 over a generalized physical examination, you will take a 4 history by symptoms, by systems. You ask all the 5 circulatory questions. You ask all the gastroenterology 6 questions. You ask all the neurological questions, and I 7 covered all the symptoms that they may have had and that 8 may have been present at Yusho. 9 Q (By Mr. McCrea) Based on information in your 10 head, not based upon a list? 11 MR. CARNEY: Well, I've never seen a doctor 12 that's ever done a physical for me have a list, that since 13 they do hundreds of physicals a week, I'm sure they're 14 smart enough to have these things in their head, but I 15 guess you're -- 16 A No, I did not. 17 MR. CARNEY: Well, your point is did he have 18 them all written done on a piece of paper, and I think he 19 said no. 20 A No, but I've taken medical histories for 50 21 years and I have not had a list, but I know what to ask 22 people. 23 Q (By Mr. McCrea) All right. Fine. 24 A Yeah. 25 Q Now, the next question is: Recognizing you	Page 96 1 else. He answered the question, and to tell him that 2 you're going to take it to the Court, go ahead. I welcome 3 you to take it to the Court because I think the Court will 4 say that this witness has done an exemplary job of 5 answering that question, and to insinuate that he's somehow 6 not answered that question is outrageous to me. Sorry to 7 lose my temper a little bit, but I -- 8 MR. McCREA: That's all right. 9 MR. CARNEY: I really feel strongly that 10 that's accusing this witness of something that is not true. 11 MR. McCREA: I would like the question read 12 and the answer read so that I can be sure that I know the 13 question which was addressed and the answer. Then I will 14 have comments as to whether or not I feel the question was 15 answered. So could the court reporter -- 16 A Well -- 17 MR. McCREA: Just a second, please, Doctor. 18 Could the court reporter please read the question and his 19 answer? 20 (Thereupon, the reporter propounded the previous 21 question and answer.) 22 MR. McCREA: He didn't answer the question. I 23 asked him what symptoms did he suspicion were caused by 24 PCBs. His answer is -- I would expect the answer to be, "I 25 didn't suspect any, I didn't suspect any or I suspected the

Page 97 1 following." Now, if he didn't suspect any, that's fine. 2 If he did suspect some, I would like to know those 3 symptoms, he has not answered the question. 4 MR. CARNEY: I disagree with you, Mr. McCrea. 5 I think he did answer the question. I just don't think you 6 liked the answer. You have some other answers that you 7 would like to give to your questions, but this is the 8 witness whose answers count, not your answers. So do you 9 have another question? 10 MR. McCREA: No. I'm going to -- 11 A Repeat that question of yours then that we are 12 discussing. 13 Q (By Mr. McCrea) I'd be happy to. What 14 symptoms did you suspicion were caused by PCBs when you 15 examined these workers before you wrote the letter? 16 MR. CARNEY: Same objection. 17 A My suspicions could vary from no symptoms 18 depending on the exposure of the man to a number of 19 symptoms that were developed after the Yusho incident. 20 Q (By Mr. McCrea) Now, Doctor, describe if you 21 would the number of symptoms developed after the Yusho 22 experience? 23 A Yes. Changes in the skin, lassitude, pains in 24 the extremities, loss of weight. 25 MR. CARNEY: Is your question asking him for	Page 99 1 MR. CARNEY: Same objection. It's got 2 undefined terms. It's vague. 3 Q (By Mr. McCrea) In other words, do you know 4 how the PCBs and the contaminant furans caused the changes 5 in the skin in Japan? 6 MR. CARNEY: Same objection. I don't know 7 what you mean. I don't know what you mean by the question. 8 It's vague. 9 A Repeat the question. 10 Q (By Mr. McCrea) Do you know how the exposure 11 to PCBs in the rice oil in Japan induced or caused the 12 changes in the skin in those people? 13 MR. CARNEY: Objection. I don't know what you 14 mean by how. How, that's a vague term to me. How, in what 15 way how? Chemically? 16 MR. McCREA: Yes, chemically. 17 A Well, first of all, it was swallowed. It goes 18 into the stomach and the intestine. It is then absorbed 19 and it goes into the liver. There are changes in the 20 oxidative enzymes of the liver, and somehow this disturbs 21 the fat metabolism of the hair follicles and the sebaceous 22 glands of the skin. I am not familiar with the details of 23 those last two steps. 24 Q (By Mr. McCrea) Can you explain how the 25 absorption of PCBs into the body chemically caused the
Page 98 1 symptoms that showed up in Yusho so I'm clear? I think 2 that's what he's answering and I just want to -- 3 Q (By Mr. McCrea) That's exactly correct. Is 4 that the way you understand it, Doctor? 5 A Yes, I presume, I believe so. 6 Q Yeah. Okay. Continue. 7 MR. CARNEY: Okay. 8 A What have I said so far? 9 Q (By Mr. McCrea) Doctor, you said changes in 10 skin, lassitude, pains in extremities, loss of weight? 11 A Changes in respiratory function such as 12 shortness of breath, tiredness, frequent illnesses, 13 irritability, headaches. That's all I can think of at the 14 present time. 15 Q All right, sir. Doctor, from the standpoint 16 of your expertise -- just a second here -- can you 17 explain the mechanisms which were implicated in the 18 induction of those toxic effects that you have just cited? 19 MR. CARNEY: I would object to the form of the 20 question. It's vague and ambiguous. I don't understand 21 it. 22 A You'll have to clarify toxic effects. Where? 23 Q (By Mr. McCrea) The nine symptoms you 24 described from Yusho, can you explain the mechanism which 25 is implicated in the induction of changes in the skin?	Page 100 1 lassitude? 2 MR. CARNEY: Objection. Same objection. 3 A You mean that particular -- You were using the 4 word PCBs generally all over. Are we still talking about 5 Yusho? 6 Q (By Mr. McCrea) Yes, we are. 7 A Okay. So that's -- 8 Q PCBs and furans. 9 A Huh? 10 Q PCBs and furans. 11 A Let's say, yes. 12 Q Let's call it the Yusho PCBs. 13 A The Yusho PCBs with its dibenzofurans and its 14 quaterphenyls. 15 Q Exactly. 16 A Can I explain how it did what? 17 Q Caused the lassitude. 18 A No, sir. 19 Q Can you explain how the PCB, the Yusho PCBs 20 chemically caused the pains in extremities? 21 MR. CARNEY: Let me object. Can I have a 22 standing objection to the form of the question? 23 MR. McCREA: Yes, you may. 24 MR. CARNEY: It's vague and contains undefined 25 terms.

Page 101 1 A Yes, it caused demyelination of the nerve 2 fibers with peripheral neuritis. 3 Q (By Mr. McCrea) What is meant by the term 4 demyelination? 5 A Well, myelin is a covering of the material, 6 and the nerve sheath covers the nerves, and you take away 7 the myelin and you leave the nerves bare as it were. 8 Q Sort of like taking insulation off a wire? 9 A Something of that sort. 10 Q Can you explain how the Yusho PCBs chemically 11 caused the loss of weight? 12 A No, except that furans have been -- 13 dibenzofurans have been associated with a wasting 14 illnesses. Whether that mechanism is in the liver or not, 15 I don't know. 16 Q Can you explain, Doctor, how the Yusho PCBs 17 chemically caused the change in respiratory function and 18 shortness of breath? 19 A No. There's a very large amount of 20 controversy over that, and whether or not those symptoms 21 were real or not has not been established. 22 Q Can you explain how the Yusho PCBs chemically 23 caused the tiredness? 24 A No, sir, I cannot. 25 Q Can you explain how the Yusho PCBs chemically	Page 103 1 system. 2 Q What is the immunological system? 3 A That's a very intricate part of a body that 4 shows, that affects how people react to things. In other 5 words, if you have an immune deficiency, you are liable for 6 the sort of illnesses. If you have hyperimmunity, you are 7 liable to other illnesses. 8 Q You mentioned that it's been reported in 9 various places. Can you elaborate on that or describe that 10 for us, please? 11 A Well, I don't know what you mean by elaborate. 12 I don't have the journals right at present, but it has been 13 reported at times and not reported, disputed at times. 14 Q Okay. Can you explain how the Yusho PCBs with 15 furans as the main causative agent chemically caused 16 irritability? 17 A No, I cannot. 18 Q Would that relate to the brain? 19 A Well, whether it related to the brain or 20 whether it was because the people were sick, were 21 irritable, whether there was any organic problem there, 22 whether it was a psychic problem, I don't know. 23 Q Can you explain how the Yusho PCBs chemically 24 caused headaches? 25 MR. CARNEY: Again the Yusho PCBs with the
Page 102 1 caused frequent illnesses? 2 MR. CARNEY: Again you're talking about the 3 furans in the PCBs? 4 MR. McCREA: Talking about the Yusho PCBs with 5 furans and quaterphenyls. 6 MR. CARNEY: It would be better if you, since 7 the literature seems to establish it was the furans, the 8 high concentration of furans that caused these problems, 9 use the word furans rather than PCBs. Otherwise, I think 10 you're confusing the jury. 11 MR. McCREA: Would you like to cite me to an 12 article? 13 MR. CARNEY: I could cite you to the same 14 article that Dr. Kelly cited you to about an hour ago. 15 MR. McCREA: What's the name of that article? 16 A Kumita, K-u-m-i-t-a, in the "American Journal 17 of Industrial Medicine", November 1984 whose statement was, 18 "It is clear that PCDFs" -- that's dibenzofurans -- "were 19 the main causative agent in the case of Yusho disease." 20 Q (By Mr. McCrea) Okay. All right, sir. Can 21 you explain how the Yusho PCBs with furans as the main 22 causative agent chemically caused frequent illnesses? 23 A Well, first of all, I'm not sure they did. 24 That's a symptom that has been reported around in various 25 places, but if it is, it is a change in the immunological	Page 104 1 furans caused, principally causing the problem? 2 MR. McCREA: With furans as the main causative 3 agent. 4 A Caused headaches? 5 Q (By Mr. McCrea) Right. 6 A I don't think anybody can explain what causes 7 headaches. 8 Q Is that neurological? 9 A Well, you can have headaches from brain 10 tumors. That's neurological. You can have headaches from 11 migraine which is vascular. You can have headaches from 12 emotions which is certainly psychological. 13 Q Okay. 14 MR. CARNEY: You can have headaches from a 15 long deposition. 16 MR. McCREA: You can have headaches from 17 working in PCBs in Bloomington, Indiana, Tom. 18 MR. CARNEY: Well, your experts disagree with 19 you on that. They don't think headaches have anything to 20 do with PCBs. 21 Q (By Mr. McCrea) Well, you need to read the 22 reports. Now, Doctor, you have discussed the symptoms from 23 Yusho and you've listed nine which you had in mind when you 24 surveyed these people. Is that a fair statement? 25 A No, it isn't a fair statement because I have

Page 105 1 these symptoms in mind when I examine anybody no matter 2 what they have, what they come in to me for. These 3 symptoms are not diagnostic of PCB or nitrofurantoin exposure 4 or intoxication or poisoning. They could occur from a host 5 of conditions. 6 Q Doctor, we're kind of back where we started. 7 Didn't I ask you for a list of symptoms based on the Yusho 8 experience, and didn't you give me one through nine based 9 on the Yusho experience? 10 A Well, no, that is not correct because it's not 11 only based on the Yusho experience. It's based on what 12 other people may have from other illnesses. You can't say 13 that a person comes into me and has a headache and I say, 14 "Have you had headaches in the last year", am I asking them 15 that because I think he's exposed to PCB or I think he may 16 have eyestrain. So I cannot differentiate my medical 17 history on the basis of PCB exposure, Yusho publications or 18 the general health or the general medical history of a 19 person. 20 Q Okay. Doctor, during the time that you worked 21 for Monsanto, did you ever make a tabulation of symptoms 22 experienced by your workers? In other words, you have 27 23 workers. You have headaches and you have X number with 24 headaches. Then you have irritability, X number with 25 irritability, frequent illness, X number and so on. Did	Page 107 1 what problems, headaches, for example, or irritability. I 2 would assume everybody has headaches from time to time or 3 irritability from time to time or these symptoms. You have 4 to be more specific and quantify what you mean by these 5 symptoms to make any sense out of it. I don't think we're 6 getting anywhere. 7 Q (By Mr. McCrea) I'll try to be more specific, 8 and I think that's a good suggestion. Have you read 9 studies by epidemiologists where they determine percentages 10 of people with certain symptoms and determine those to be 11 significant at a scientifically acceptable standard? 12 A I may have. Do you have the studies? 13 Q Is that a recognized area of science? 14 A I don't think symptoms are relative. I think 15 that -- I think they are looking for objective findings 16 rather than something you can see, something that is shown 17 by physical examination, laboratory examination or x-rays. 18 Symptoms vary all over the place and -- 19 Q Okay. 20 A Symptoms also are, there are many causes for 21 it. 22 Q Did you see a list of symptoms in the studies 23 of the people in Japan? 24 A I may have. I don't know. 25 Q And as I understand it, you would consider
Page 106 1 you ever do that from 1936 to 1974? 2 MR. CARNEY: Objection to the question. It's 3 vague and ambiguous. It doesn't define what group you're 4 talking about. 5 MR. McCREA: PCB workers. 6 A No, I never did that and you never do that 7 with anybody because you are, there are all variations in a 8 person's symptoms. When you say headaches and this 9 tabulation we ought to make, do I say eight headaches, 10 headaches four times a day, headaches three times a week. 11 We cannot do that in medical examinations. You have to 12 take the sum total of a person's history, his medical 13 history and then make your diagnosis from that. 14 Q (By Mr. McCrea) Doctor, I appreciate the fact 15 that you didn't do that from 1936 to 1974. 16 A I did not make a tabulation, that's correct. 17 Q Right. So you don't know what percentage of 18 workers had what problems? 19 MR. CARNEY: Well, I'm going to object to 20 that. This question is totally irrelevant. 21 Q (By Mr. McCrea) Well, strike it. Strike the 22 question, Tom. Do you know and do you have any results as 23 to what percentage of workers had what problems? 24 MR. CARNEY: Well, I'm going to object here. 25 I don't know what you mean, what percentage of workers have	Page 108 1 objective evidence such as x-rays, EKG, EEG and that type 2 of information as significant to prove epidemiologically if 3 these workers have suffered a certain set of health 4 problems. Is that a fair statement? 5 A No, it isn't fair because x-rays -- It all 6 depends on what you're looking for. I would say that there 7 are certain physical conditions that you were looking for. 8 If you were talking about PCBs, if I saw a group of people 9 with chloracne, I would know this, and they worked with 10 PCB, I would be certain that they got their problems from 11 PCB. If I saw a bunch of people with headaches and they 12 were working with PCBs and they didn't have chloracne, I 13 would not believe that their headaches were coming from 14 PCBs. 15 Q Okay. So unless you see chloracne, it's your 16 determination that there has been no injury by PCBs? 17 A I think that's mine and I think that's the 18 feeling of the majority of the writers. 19 Q Can you name two or three writers who feel 20 that way? 21 A I'm sure you could start with Kimbrough again. 22 Q She feels that if you don't have chloracne, 23 there have been no injuries by PCBs? 24 A That's correct. 25 Q All right. Who else?

Page 109 1 A Oh, I don't know right off the top of my head, 2 but that's, I'm sure they're around because I've seen them. 3 Q But you don't remember them? 4 A No, I don't remember them. 5 Q Okay. Now, Doctor, did you see chloracne in 6 any of these people? 7 A Which people? 8 Q The 27. 9 A No, none. 10 Q So that more or less ended your study? 11 A No, it didn't. 12 MR. CARNEY: I object. 13 Q (By Mr. McCrea) Well, if you didn't see 14 chloracne and your opinion is that if you don't have 15 chloracne, there are no health problems, was there any 16 reason to go forward? 17 A Oh, I was looking for any health problems, 18 yes, and I wanted to reinforce my opinion that chloracne is 19 the hallmark of PCB toxicity, and if I found no chloracne 20 and I found a bunch of liver problems, I would have changed 21 my mind. 22 Q You wanted to reinforce your opinion? 23 A That's correct. 24 Q Okay. Did you approach that endeavor with an 25 open mind?	Page 111 1 body. 2 Q Can they alter metabolic processes? 3 A Beg your pardon? 4 Q Can they alter metabolic processes? 5 A They may. They may not. 6 Q And by metabolic process, you mean what? 7 A The chemical reactions that go into the body, 8 into the daily working of the body. 9 Q So PCBs, if absorbed in sufficient quantities, 10 can alter the metabolic function and the chemical reactions 11 associated therewith? 12 A In certain places of the body, yes. Not -- 13 Q Which places? 14 A The liver. 15 Q What, do they just stay in the liver, the 16 enzymes? 17 A Well, an enzyme, there is specific enzymes for 18 all -- You don't have one enzyme that goes around working 19 every place in the body. There are literally hundreds of 20 thousands of enzymes in the body. Some have to do with 21 protein metabolism, some fat metabolism, some sugar 22 metabolism. There's a lot of -- some oxygen metabolism. 23 There are all sorts of enzymes. 24 Q Can PCBs affect more than one enzyme? 25 A I can't answer that.
Page 110 1 A Of course I did. I approached it by examining 2 the people to see if there was anything wrong with them. 3 Q Doctor, can you explain enzyme induction to us 4 as it is caused -- Well, first of all, let me ask you this. 5 Does PCB exposure cause enzyme induction? 6 MR. CARNEY: Object to the form. It's vague. 7 I don't know what you mean by enzyme induction. 8 MR. McCREA: Well, that's why we have a doctor 9 here to explain it, Tom. 10 MR. CARNEY: Well, I don't know what you mean 11 by it. If the doctor understands the question, he can 12 answer. 13 MR. McCREA: Okay. 14 A PCB exposure does not cause enzyme induction. 15 PCB absorption in sufficient amount does cause enzyme 16 induction. 17 Q (By Mr. McCrea) What is enzyme induction? 18 A Enzyme induction means that you start the 19 formation of enzymes in certain parts of the body, 20 primarily the liver. 21 Q That all? 22 A Well, what else do you want? I mean, that's 23 what enzyme induction is. 24 Q What are the functions of enzymes? 25 A They enter into every metabolic process in the	Page 112 1 Q Are the enzymes -- Is the enzyme induction 2 caused by absorption of PCBs a factor in chloracne? 3 A I don't believe that's been established. 4 Q Can PCBs, if absorbed into the body in 5 sufficient quantity, result in the inhibition of 6 mitochondrial respiration? 7 A Yes. Well, that's an enzyme function. 8 Q And what is the effect of that enzyme function 9 resulting in the inhibition of mitochondrial respiration on 10 the individual? 11 A It depends on how much and how many of the 12 mitochondria are affected. 13 Q All right. Now, the low level, at a low 14 level, then a high level. 15 MR. CARNEY: Objection to the form of the 16 question. It's vague. 17 A Low level, it wouldn't make any difference at 18 all. At a high level we would get some problem with the 19 liver metabolism. 20 Q (By Mr. McCrea) Can -- And is that related to 21 -- When it says mitochondrial respiration, are we talking 22 about the liver or are we talking about the lungs? 23 A You have to have oxygen in all the cells in 24 the body. Mitochondria are part of the cells, usually in 25 the liver, and the respiration means a transfer of oxygen

Page 113 1 past the cell membrane. The mitochondria are not puffing 2 up and down like your lungs are. 3 Q Okay, Doctor. How much time? Doctor, three 4 minutes left on this tape. Can the absorption of PCBs into 5 the body in sufficient amounts result in estrogenic effects 6 in altered steroid metabolism? 7 A In some species, yes. Some species, no. 8 Q What is that? 9 A What is what? 10 Q Estrogenic effects in altered steroid 11 metabolism. 12 A Well, estrogens obviously are sex hormones. 13 Steroids are also hormones, but have to do with building up 14 the body. That's why weight lifters take them. 15 Q And what is the effect of the estrogenic 16 effects on altered steroid metabolism? 17 A You have to tell me how much they have. 18 Q Well, a lot. 19 MR. CARNEY: Well, I'm going to object to a 20 lot. 21 A I don't know what at lot means. 22 Q (By Mr. McCrea) Well, you'll have to tell me 23 what you mean by asking me what I mean because I don't 24 know. 25 A Let's run that by again. That's got me	Page 115 1 specifically. 2 MR. McCREA: Thank you. Time for a break. 3 (Thereupon, a lunch recess was taken.) 4 Q (By Mr. McCrea) Dr. Kelly, I think we left off 5 after your discussion of estrogenic effects on altered 6 steroid metabolism. You have an opinion if sufficient 7 absorption of PCBs can result in the mobilization and 8 redistribution of stored PCBs? 9 A It may and it may not. 10 Q What is the effect of mobilization and 11 redistribution of stored PCBs? 12 A What may be excreted. In other words, the 13 PCBs absorbed in the fat and if it's mobilized, it could be 14 excreted. 15 Q Are there other -- 16 A It could be metabolized. 17 Q Are there other consequences? 18 A Depends on how much. 19 Q Well, assuming there is a sufficient amount. 20 MR. CARNEY: Objection again to the form of 21 the question. 22 Q (By Mr. McCrea) How much would it take to 23 cause other effects? 24 A I don't know. What species are we talking 25 about?
Page 114 1 confused. 2 MR. CARNEY: It's got me confused. 3 MR. McCREA: Well, it's a little bit -- 4 MR. CARNEY: I don't know if he should 5 speculate as to what you mean. 6 Q (By Mr. McCrea) Well, sufficient quantities, 7 sufficient amounts. 8 A To do what now? 9 Q You're getting me off track, Doctor. 10 A I'm sorry. You want her to read it back? 11 Q Doctor, can absorption of PCBs into the body 12 in sufficient amounts result in estrogenic effects on 13 altered steroid metabolism, and if so, what is the effect? 14 MR. CARNEY: Objection, compound and vague and 15 ambiguous as to what you mean by sufficient. 16 A The answer is yes to the first part of your 17 question, and the second is the effect would determine, be 18 determined by how much they're altered. 19 Q (By Mr. McCrea) And if they're altered a lot, 20 what is the effect? 21 MR. CARNEY: Objection to form. 22 A That again varies with the species. If you're 23 a mink, you have one problem. If you're a guinea pig, 24 something else, and if you're a dog or a human, you'll have 25 something else. So I cannot answer that question	Page 116 1 Q Humans. 2 A I don't know. 3 Q Can absorption of PCBs into the body result in 4 covalent binding to cellular macromolecules? 5 A I'm not an enzymatic enzymology chemist. I 6 cant answer that. 7 Q Can absorption of PCBs into the human body 8 result in altered calcium metabolism? 9 A I don't know if it does in the humans. It 10 occurs in avian species. That's birds. 11 Q Did Monsanto rely on animal testing to 12 determine potential health effects to humans? 13 A They relied on animal testing. They relied on 14 experience with their workers. They relied on the public, 15 published information concerning PCB. 16 Q What is altered calcium metabolism? 17 A Just what it says. Calcium is an important 18 ingredient of the body. It takes -- It's used at the 19 cellular level, and altered means you either get too much 20 or too little. 21 Q Have bone and joint deformities been reported 22 as a result of the ingestion of Yusho PCBs in human beings? 23 MR. CARNEY: These again are the PCBs where 24 the furans were the principal cause of the problem. 25 MR. McCREA: The literature speaks for itself.

Page 117 1 A Beg you pardon? You talking to me or him? 2 MR. McCREA: Well, I'm talking to him. 3 A The question is? 4 MR. McCREA: Could you repeat the question? 5 (Thereupon, the reporter propounded the pending 6 question.) 7 A I don't recall. I do not think it was a very 8 prominent effect. 9 Q (By Mr. McCrea) Have joint pains been 10 recorded in the children born to the mothers who ingested 11 the Yusho PCBs? 12 A We're talking now about children? Previously 13 you talked about joint deformity. 14 Q I'm now talking about joint pains. 15 A I think they may have. I'm not certain. 16 Q Doctor, can you explain the mechanism by which 17 the Yusho PCBs caused joint pain in children born to the 18 mothers who ingested the rice oil contaminants with the 19 PCBs, furans and quaterphenyls? 20 A No, I can't. 21 Q You do acknowledge that's documented? 22 MR. CARNEY: Are you talking about with the 23 furans or PCBs? 24 A I said it may be. I haven't seen the 25 documentation lately. I'd be happy to look at it and give	Page 119 1 incident? 2 A '68 or '69. 3 Q In what year was the incident in Taiwan? 4 A '79. 5 Q Are you familiar with any of the authors of 6 this article titled "Congenital Poisoning by 7 Polychlorinated Biphenyls and Their Contaminants in Taiwan" 8 by reputation or by direct knowledge, and if so, just 9 explain to us what you know about the authors? 10 A Well, I don't know anything about the authors. 11 I never heard of them. 12 Q Are you familiar with the Triangle Park 13 Research Laboratory? 14 A Yes, I am. 15 Q Does it enjoy a good reputation? 16 A Well, there -- You were talking about the 17 research laboratories in the Research Park. There are any 18 number of laboratories in that. 19 Q Okay. 20 A Some government, some private. So if you're 21 asking about do I know whether the National Institute of 22 Environmental Health Sciences Research, if that's what 23 you're asking about, I do not believe this is a government 24 agency, and I don't know anything about its reputation. 25 Q All right. Now, as the expert witness and a
Page 118 1 you a definite opinion. 2 Q (By Mr. McCrea) Talking about the joint pain 3 in children. 4 A That's what you're -- Yeah, show me the 5 documentation. I'll be happy to talk about it. 6 MR. McCREA: All right, sir. Can you -- Can 7 we staple this and mark it is our next exhibit? 8 (Thereupon, the reporter marked Plaintiff's 9 Deposition Exhibit Two, for identification.) 10 Q (By Mr. McCrea) Doctor, I -- 11 MR. CARNEY: May I take a look at it? 12 Q (By Mr. McCrea) Doctor, I hand you what the 13 court reporter has marked as Plaintiff's Exhibit Two dated 14 6-1-90, and I'll ask if you will take a look at that 15 article. My first question is: Have you read that before 16 today? 17 A I do not recall whether I read this before or 18 not. 19 Q Are you familiar with the poisoning in Taiwan? 20 A Yes, I am. 21 Q Was it similar to the poisoning in Japan? 22 MR. CARNEY: Objection to the form. 23 A It was similar to the -- yes, it was, to the 24 Yusho incident. 25 Q (By Mr. McCrea) In what year was the Yusho	Page 120 1 fact witness for Monsanto, you are constantly updating 2 yourself on the literature, are you not? 3 A As well as I could, yes. 4 Q All right. What is the title of this 5 particular article? 6 A "Congenital Poisoning by Polychlorinated 7 Biphenyls and their Contaminants in Taiwan." 8 Q Explain to the jury what the word congenital 9 means. 10 A Something that exists from birth. 11 Q All right. Now, Doctor, can you, or let me 12 direct your attention if I might to the second page of the 13 article. 14 A I'm going to read it from the beginning if I'm 15 going to go to the second page. 16 Q All right, sir. I agree. 17 A In the first place, I see none of the 18 qualifications or degrees of the authors. There is W. J. 19 Rogan. It doesn't say what he is or who he is. R. C. 20 Gladen, it doesn't say who he is or what he is. N. B. 21 Ragan, those three. Then we have some other individuals, 22 but the three people in the lead, I do not have their 23 degrees. They do not say with what establishment they are 24 attached. 25 MR. McCREA: Can we shut off the tape while he

Page 121 1 reads that? 2 MR. CARNEY: Yeah. 3 (Thereupon, a short recess was taken.) 4 Q (By Mr. McCrea) Dr. Kelly, have you had time 5 to read the article? 6 A Yes, I have. 7 Q And does the article compare the condition of 8 health of children born to mothers who ingested the rice 9 oil contaminated with PCBs and its by-products to a control 10 group? 11 A Yes. 12 MR. CARNEY: Let me object here for the 13 record. This is a document that was torn out of a larger 14 document just before it was handed to the doctor. There's 15 no testimony whether it's a complete, self-contained 16 document or a complete document. The -- Dr. Kelly hasn't 17 been able to authenticate it as to its being a reliable 18 document. There's no foundation that these people are 19 qualified to write such an article, so I just object for 20 the record to asking questions about an article that hasn't 21 been authenticated in any way. 22 Q (By Mr. McCrea) Dr. Kelly, I will represent 23 to you that that is the entire article. Can you determine 24 by looking at the exhibit if it includes all the pages of 25 the article?	Page 123 1 Q All right. Would you refer to table one? 2 A Yes. 3 MR. CARNEY: Just a minute. I'm going to 4 object to -- here you have a document that hasn't been, 5 there's been no foundation laid as to where it came from, 6 who the authors are, and now you're blowing it up, and 7 before you show it to anybody, I just want to make my 8 objection and that is that it hasn't been authenticated to 9 be introduced into evidence, so it's improper to show it to 10 the jury. Can I have a standing objection to that during 11 this line of questioning about this article? 12 Q (By Mr. McCrea) Doctor, are you familiar with 13 the publication? 14 MR. CARNEY: Well -- 15 Q (By Mr. McCrea) In which this article was 16 written? 17 A Yes, I am. 18 Q And is that authoritative and relied upon by 19 doctors and scientists? 20 A I would say that there's a double question 21 there. It's an excellent article. It's an excellent 22 magazine, an excellent journal. They always usually put in 23 preliminary reports which at some later date may be 24 disputed or changed. 25 Q Yes, sir. Now --
Page 122 1 MR. CARNEY: I'm going to object to that. It 2 would be pretty hard for the doctor since he doesn't know 3 if he ever read the article to determine whether there are 4 more pages to the article or not, but if he can answer it, 5 fine. 6 A I think it appears to be a complete article. 7 Q (By Mr. McCrea) And then are there blow-ups of 8 the charts? 9 A Well, table one is blown up. Table two and 10 table three, yes, sir. 11 Q All right, sir. Dr. Kelly, can you recite for 12 the jury the findings of the authors of this article with 13 respect to the health symptoms of the children born to 14 mothers who consumed the contaminated rice oil compared to 15 the control group of children whose mothers had no 16 exposure? 17 MR. CARNEY: Can I have a standing objection 18 to this, any questions about this document with regard to 19 its authenticity, its establishment as a scientific 20 document and as to whether it's a complete document. 21 Q (By Mr. McCrea) Yes. Doctor? 22 A What do you want? 23 Q The blow-ups. Can you read those charts 24 without the blow-ups? Is that fair enough to you? 25 A Yes.	Page 124 1 MR. CARNEY: Can I have a standing objection 2 or should I object on each question about this article? 3 MR. McCREA: No, I agree that you may have a 4 standing objection as to all of those objections that you 5 have noted during the entire course of the doctor's 6 testimony. 7 MR. CARNEY: Okay. 8 Q (By Mr. McCrea) Doctor, would you refer to 9 table one? And if the camera could focus on that. 10 A Yes, sir. 11 Q Will you read the introduction to the table? 12 A "Physical signs present at birth and selected 13 medical history items as reported by mothers. Frequencies 14 are those reporting 'yes' or those reporting 'yes' or 'no'. 15 'Don't know' and missing values are not included." 16 Q On the upper left column it has physical sign 17 and then exposed and control. Can you explain that to the 18 jury? 19 MR. CARNEY: Well, I'm going to object to 20 this. Dr. Kelly didn't write this article. He doesn't 21 even know the authors, and I'm going to object to your 22 asking him to speculate what somebody else meant by using 23 words since he hasn't talked to them. In fact, he doesn't 24 know them. He'd have to speculate inside their minds. 25 Q (By Mr. McCrea) Can you explain that to the

Page 125 1 jury, Dr. Kelly? 2 A Physical sign is something you see. Exposed 3 is presumably the individuals who were exposed in the 4 Taiwan episode, and control is some group. I don't know 5 where he got this control group. Let's see where he found 6 this control group. 7 Q All right, sir. 8 A I'm trying to find out where his controls came 9 from. I'm sorry I'm so slow, but... 10 Q No, that's all right. 11 A He stated in his summery at the top there were 12 108 unexposed controls were examined and evaluated, but I'm 13 going through the body of the report and I don't see where 14 he mentions where these nonexposed children came from. 15 Q What does -- 16 A You've had this much longer than I do. Do you 17 want to point it out to me? 18 Q Well, I assume that by control he means those 19 who were not born to the mothers who ingested the rice oil 20 which was contaminated. 21 MR. CARNEY: Well, I'm going to object to -- 22 A Oh, yes. 23 MR. CARNEY: -- any assumptions here. We're 24 talking about an article that the writers of the article 25 are unknown to the witness.	Page 127 1 that secrete, that are fat secreting type of glands, and we 2 know that PCBs with nitrofurans, with benzofurans cause acne 3 which is a disturbance of the fat metabolism in the sweat 4 glands, in the hair follicles, and it is no surprise to me 5 at all that there would be some eye discharge when you have 6 a serious condition serious enough to cause chloracne. 7 Q The next category is eyelid swelling. Can you 8 explain the method by which the PCBs with furans and 9 quaterphenyls produce this condition? 10 A Well -- 11 MR. CARNEY: Well, let me object. You're 12 assuming that -- First of all you're saying PCBs cause this 13 condition, and I think you're misstating the facts again. 14 You're mixing up the PCBs and the furans. 15 MR. McCREA: I said PCBs with furans and 16 quaterphenyls. 17 MR. CARNEY: I don't think you said it in that 18 last question. 19 MR. McCREA: Yes, I did. 20 A The same things I said for the discharge. The 21 glands that cause the discharge also cause the eyelids to 22 swell. That's where the glands are in the eyelids. 23 Q (By Mr. McCrea) Teeth present, can you 24 explain the mechanism by which that comes about? 25 MR. CARNEY: Well, I'm going to object to
Page 126 1 A I think the big point is -- Marie said just a 2 moment. 3 Q (By Mr. McCrea) Doctor, you're unable to 4 determine what is meant by the word control. Is that 5 right? 6 A Well, I know what is meant by the word 7 controls, but I do not know where he got his 108 exposed 8 controls, and I have no way of knowing whether they're 9 really truly controls, whether they came from the same 10 economic stratum or not. I don't see in the body of this 11 report any mention of where he got his controls. I don't 12 even know if they're the same age. It doesn't mention 13 that, I don't think. This -- It doesn't say anything about 14 a control group. He says, "I've got 108 controls," period. 15 I don't know what the controls were. 16 Q All right. The chart on table one states that 17 the exposed group of children, there were 32 of 108 with 18 white eye discharge, and in the control group there were 5 19 of 113. Is that a symptom of which you have seen reported 20 in Yusho? 21 A Yes. 22 Q Can you explain the method by which the PCBs 23 with the furans and quaterphenyls cause white eye 24 discharge? 25 A There are -- There are glands in the eyelids	Page 128 1 that. I don't know what is meant by teeth present. 2 MR. McCREA: Teeth present at birth. When the 3 children are born, they're born with teeth. 4 MR. CARNEY: I don't see that in the, in the 5 chart, but at any rate, I think the question is vague and I 6 think you're implying that this is the Yusho incident or I 7 think you mentioned it. 8 MR. McCREA: No, it's Taiwan. 9 MR. CARNEY: This is Taiwan, not Yusho. 10 Q (By Mr. McCrea) That's correct. Can you 11 explain the mechanism by which that comes about, Doctor? 12 A No, sir, I do not know that, but that has been 13 reported in the Taiwan episode. 14 Q And Yusho, too? 15 A I believe so. 16 Q All right. Irritated or swollen gums, can you 17 explain the mechanism for that? 18 A Same as teething in babies. The teeth come 19 out, the gums are irritated or swollen or maybe an added 20 mechanism, but that is certainly a major one. 21 Q All right. Hyperpigmentation. What is that, 22 hyperpigmentation? 23 A Pigmentation is coloring. Hyper means more 24 coloring, excess coloring. 25 Q And can you explain the mechanism by which

Page 129 1 PCBs, furans and quaterphenyls produce that condition? 2 A There is some deformity of the skin 3 metabolism. There's some derangement of the skin 4 metabolism, and some of the melanin in the skin is 5 overdeposited. It's oversecreted or overformed. 6 Q And does that give it a darker coloration? 7 A Yes. I don't know what happens in an 8 Oriental, but I think it's darker. 9 Q All right, sir. Deformed or small nails, can 10 you explain the mechanism by which that symptom is 11 produced? 12 A Well, the question of nails, eyelids, teeth, 13 skin all come from the same embryonic layer in the fetus, 14 and so presumably -- I'm now assuming things which I 15 shouldn't -- there is the same mechanism that causes the 16 deformity, the deformed, early eruption of the teeth is 17 also involved in the deformity of the nails. 18 Q All right, sir. Acne? 19 A Well, that's chloracne. That's a disturbance 20 of the fact metabolism in the skin. 21 Q Now we go down to the second category. The 22 first category was at birth. The second category is 23 subsequent history. Is that the way you read the chart? 24 A Yes, it is. 25 Q Has bronchitis or pneumonia in first six	Page 131 1 which bronchitis or pneumonia in the first six months is 2 produced by the absorption of PCBs, furans and 3 quaterphenyls? 4 A Well, first I'm not sure that that's the 5 cause. 6 Q Because? 7 A Because with the absence of what appears to be 8 an adequate control group, I just don't know. Certainly 9 babies get bronchitis in their first six months, so I 10 cannot say whether this is due to PCBs or not, PCBs with 11 their contaminants. 12 Q There's 30 out of 124 compared to five out of 13 115? 14 A As I said before, I'm not sure what this 15 control is, if these people -- 16 Q All right, sir. 17 A -- who had the 30 had more children or they 18 were in a poor economic group, then the controls, obviously 19 they'll have more bronchitis and pneumonia. 20 Q All right, sir. Bronchitis bad enough for two 21 days in bed, 21 out of 126 to three out of 111. Do you 22 find those numbers significant in the exposed group? 23 A Not unless I know more about the relationship 24 of the exposed group to the control group. 25 Q Seizure with fever, 15/127, 5/115. Can you
Page 130 1 months. Can you explain the relationship of PCBs, furans 2 and quaterphenyls to that condition? 3 MR. CARNEY: Again you're lumping PCBs and 4 furans and quaterphenyls all in the same category, and I 5 think that's an attempt to mislead the jury into thinking 6 that they're all the same thing. 7 Q (By Mr. McCrea) What's the title of the 8 article, Doctor? 9 A The title of the article is "Congenital 10 Poisoning by Polychlorinated Biphenyls and their 11 Contaminants in Taiwan." 12 Q Thank you. Can you explain the method by 13 which the relationship of polychlorinated biphenyls and its 14 contaminants as noted by the title of the article to that 15 condition? 16 MR. CARNEY: Well, the title of the article 17 doesn't spell out what the contaminants are. 18 MR. McCREA: Furans and quaterphenyls. 19 MR. CARNEY: Well, that wasn't in the title. 20 You just read the title. 21 Q (By Mr. McCrea) You may proceed. 22 A Say the question over. 23 Q All right, sir. 24 A I get lost in this. 25 Q All right. Can you explain the mechanism by	Page 132 1 explain the relationship of PCBs to seizure with fever? 2 A I can relate the relationship of bronchitis or 3 pneumonia to seizure with fever. Whenever you get an 4 elevated temperature in a child, you are very likely to 5 have a seizure, but as I said before, I cannot relate the 6 seizures with fever to PCBs without knowing more about the 7 control group. 8 Q Seizure without fever, would you agree that 9 there is no relative difference in those figures? 10 A That's correct. 11 Q Chipped or broken teeth, 38 of 107 to 25 of 12 106. Would you consider that a significant elevation and 13 something that would concern you as the former doctor of 14 Monsanto or not? 15 A Well, I'd have to have an epidemiologist to 16 tell me whether this is statistically valid or not, but 17 anyway, if their teeth came out earlier, they would 18 probably got a better chance of getting them chipped or 19 broken. 20 Q I see. Hair loss, 14 of 115 compared to two 21 of 105. Do those figures look significant to you, and if 22 so, can you explain the mechanism by which PCBs are related 23 to hair loss? 24 A No, I can't, but again hair is in the same 25 grouping as teeth, skin, nails. It's all part of the

Page 133 1 ectoderm of the body. 2 Q Acne scars, 11 and 115, 0/106. Do you feel 3 that you've discussed that adequately in the previous 4 testimony in this deposition? 5 A Well, yes, except I do not know what they are 6 calling acne scars because other reports, especially one by 7 Kimbrough, did not show any acne scars and anything like 8 this, this percentage. In other words, 16 people with acne 9 and subsequently they had 11 of those had scars. Kimbrough 10 had 39 people with acne and she had very, very few scars. 11 So I don't know what that means. 12 Q What's the date of this article? 13 A '88, but I don't know what she was, what parts 14 she referred to. 15 Q Loss of muscle strength. Do you have an 16 opinion, Dr. Kelly, if exposure to PCBs, furans and 17 quaterphenyls can result in loss of muscle strength? 18 MR. CARNEY: Are you saying based on this 19 data? 20 MR. McCREA: No, does he have an opinion. 21 A I don't know, but I don't know how -- Oh, 22 sorry. 23 MR. CARNEY: I'm sorry. Again you're talking 24 about the Japanese or the Taiwanese PCBs with the heavy 25 concentrations of furans, or are you talking about the	Page 135 1 in loss of muscle strength and if so, the mechanism by 2 which that -- 3 A First of all, I would have to see more -- 4 MR. CARNEY: Objection to the form. 5 A I would have to see more data than this is 6 here. Secondly, they don't say how much muscle strength it 7 is, what their perimeters of testing for muscle strength. 8 So I would not be in a position to answer that question. 9 Q (By Mr. McCrea) Joint pain. Do you have an 10 opinion, Dr. Kelly, if exposure to PCBs, just the PCBs can 11 result in joint pain? 12 A No, I do not think I can. 13 Q Do you have an opinion if exposure to PCBs 14 with furans and quaterphenyls with furans at a level of .6 15 milligrams can result in joint pain? 16 A I would have to reference this some more. I'm 17 not sure whether that was true or not. 18 Q Have you ever heard of children being born 19 with joint pain? 20 A I'm not a pediatrician. I don't know much 21 about children and joint pains. I don't know. 22 MR. CARNEY: I'm not sure -- 23 A As I understand, none of these were born with 24 joint pains. They were not at birth. We've seen at the 25 top grouping it says at birth. I don't see joint pains up
Page 134 1 Monsanto PCBs with very few furans. 2 MR. McCREA: I'm talking about if he has -- 3 MR. CARNEY: Which type of furans? 4 MR. McCREA: I'm talking about the PCBs 5 contaminated with furans and quaterphenyls, if he has an 6 opinion if that can result in a loss of muscle strength. 7 MR. CARNEY: Well, I'm going to object. I 8 don't think you've given him enough information as to what 9 kind of furans, as to the dose. Obviously you can feed any 10 species including a human enough of almost any product and 11 you can get adverse health effects as you well know, so you 12 haven't given him enough information. 13 MR. McCREA: Well, at a dose of .6 milligrams 14 to the mother of a furans which would be, if you had one 15 ounce, that would be sufficient to cause toxic effects in 16 50,000 people, with that dose. 17 MR. CARNEY: I'm going to object to the form. 18 It's very ambiguous now as to what the question is, but if 19 you understand it, you can answer. 20 A Well, I'd like to have it repeated so we'll be 21 sure I can understand it. We were talking about loss of 22 muscle strains, I believe. 23 Q (By Mr. McCrea) Yes, sir. Do you have an 24 opinion if exposure to PCBs, furans and quaterphenyls with 25 a dose of furans at .6 milligrams to the mother can result	Page 136 1 there. It was all subsequent history. 2 Q (By Mr. McCrea) I stand corrected. Have you 3 ever heard of children having joint pain? 4 A Lots of them. I've had it myself when I was a 5 child. 6 Q All right, sir. Generalized itching. Do you 7 have an opinion if PCBs contaminated with furans and 8 quaterphenyls can result in generalized itching? 9 MR. CARNEY: Same objection. 10 A I have no opinion. On the basis of this, I 11 would say I do not accept this as a valid authority on 12 that. 13 Q (By Mr. McCrea) All right. Skin abscesses or 14 boils. 15 A Yes, I think that -- whether 11 out of 103 or 16 26 out of 116 is statistically valid, I don't, I'd have to 17 refer to an epidemiologist, but certainly if they have 18 acne, if they have acne scars, obviously they have a 19 history of skin abscesses. 20 Q Warts? 21 A I have not seen that as a prominent feature in 22 any of the articles that I've seen about contaminated PCBs 23 with benzofurans. 24 Q All right, sir. Can you go to the table two? 25 A Yes, sir.

Page 137 1 Q Do you have an opinion, Doctor, if any of the 2 physical signs listed in the column on table two can be 3 caused by exposure to PCBs contaminated with .6 milligrams 4 furans and quaterphenyls? And just go down the list and 5 give us your opinion. First, gum hypertrophy. 6 A Yes, that could be caused. 7 Q Tooth chipping? 8 MR. CARNEY: Are you asking him whether based 9 on this data he comes to the conclusion that that can be 10 caused because I think he's already said that this data, 11 there's no control group information to really make this 12 data significant unless he knows what the control group 13 was, where, what population was used. Are you just asking 14 for his opinion? 15 MR. McCREA: No, I'm just asking for his 16 opinion. 17 MR. CARNEY: Okay. 18 Q (By Mr. McCrea) Gum hypertrophy you've 19 answered. Tooth chipping? 20 A I don't know about that. 21 Q Intraoral hyperpigmentation? 22 A Yes, I think that could be associated. 23 Q Caries? 24 A I would certainly doubt that. 25 Q Acne?	Page 139 1 A Well, the genital area is obvious. The 2 perineal area is the area between the genitals and the 3 rectum. 4 Q All right, sir. 5 A In the skin. 6 Q All right. Pigmented or deformed nails? 7 A Yes, that has occurred in the Yusho incident, 8 also. 9 Q Fingers? 10 A Yes, sir. 11 Q Toes? 12 A Yes, sir. 13 MR. CARNEY: I think we're not just talking 14 about fingers and toes, but the nails. Isn't that right? 15 We don't want to confuse the jury. 16 Q (By Mr. McCrea) It says nails on fingers and 17 the nails on the toes; correct? Right? Not the skin. 18 Conjunctivitis or cysts? 19 A Well, this -- According to this, there is no 20 difference. 21 Q All right. Those numbers are just about the 22 same, aren't they? 23 A I would say so. 24 Q All right. Can you pronounce the next one for 25 us and tell us what that is?
Page 138 1 MR. CARNEY: Just so -- Why don't you, to help 2 the jury understand what caries is, you might ask what is 3 it. 4 Q (By Mr. McCrea) What are caries? 5 A Holes in your teeth. 6 MR. CARNEY: Cavity, I think. 7 A Cavities in your teeth. 8 Q (By Mr. McCrea) Okay. Acne or acne scars? 9 A Here again, this is very confusing because 10 subsequent history showed no acne scars in this supposedly 11 control group, and then a selected finding shows ten out of 12 106. I wonder where those ten came from or when they 13 showed up. As I said, no acne scars in the first table and 14 ten of them in the second table, so I don't know. 15 Q All right, sir. Fair enough. 16 Hyperpigmentation? 17 A Hyperpigmentation of the face or head has 18 occurred in chloracne. 19 Q Okay. What about perineal genital? What is 20 that? 21 A I have not seen it. What did you say? Did 22 you ask a question? 23 Q Yeah. Right here. 24 A What is what? 25 Q What is that?	Page 140 1 A Lymphadenopathy. That means swollen lymph 2 glands. 3 Q Do you have an opinion if that can be caused 4 by exposure to PCBs contaminated with furans at .6 parts 5 per milligram? 6 A It depends on where the lymph glands are that 7 are swollen. In other words, if you have infected cysts 8 from chloracne in your face, you will have swollen lymph 9 glands in you neck. So I'd have to know -- Those would be 10 connected. If only chloracne was on the face and you had 11 swollen lymph glands in your perineal region or in your 12 groin or under your arm, that would not be connected. 13 Q Eyebrow flare? 14 A That's a physical condition that I don't know 15 much about. I'll have to read what he means by eyebrow 16 flare. I don't know what he's talking about on eyebrow 17 flare, so I can't comment. 18 Q Lungs not clear to auscultation? 19 A Auscultation. Well, here again if you have 20 bronchitis and you have repeated or pneumonia, your lungs 21 would not be clear. 22 Q Do you have an opinion if PCBs contaminated 23 with furans and quaterphenyls can produce that condition? 24 A I'm not sure that they can. 25 Q Can you pronounce the next one for us?

Page 141 1 A Hirsutism. That means excess hair. 2 Q Do you have an opinion if PCBs contaminated 3 with furans and quaterphenyls can produce that condition? 4 A Yes, it can. 5 Q Hyper -- Can you pronounce that? 6 A Telorism. I'm sorry. I just can't define 7 that for you. 8 Q All right. And the last one, Doctor? 9 A Clinodactyly. I think that is joining 10 together of the fingers of some type, but I don't see what 11 he is talking about there. 12 Q All right. Doctor, the last chart is table 13 three which deals with developmental testing and behavioral 14 assessment. Have you ever performed any similar type tests 15 on workers at Monsanto? 16 A No, sir. 17 Q Have you ever read any reports out of Yusho or 18 any other area that discussed these particular testing and 19 behavioral assessments when individuals were exposed to 20 PCBs, furans, quaterphenyls? 21 A If I've read them I don't, I don't recall 22 them. 23 Q Can you interpret for the jury this 24 information? 25 A Well, I can only interpret the center, the	Page 143 1 think we ought to know what these things are. Otherwise, I 2 don't think it helps the jury to know that somebody's 3 slightly higher or slightly lower. 4 Q (By Mr. McCrea) Do you know what those are, 5 Doctor? 6 A I have -- No, I don't. 7 Q All right, sir. But at any rate, the scores 8 were higher for the control group than the exposed group? 9 MR. CARNEY: I'm going to object. There's no 10 evidence as to whether it's better to have higher or lower. 11 We again have the problem, we don't know what the control 12 group, where they came from, which population, what their 13 educational levels were, what their environment was. So it 14 really -- Just to read off some scores that are very close 15 to the same anyway doesn't really give any relevance to 16 anybody. 17 Q (By Mr. McCrea) Doctor, have PCBs been 18 implicated in the reduction of IQ? 19 A Not to my knowledge, and by the way, if I 20 could explain that, the difference here, these exposed and 21 controls wasn't very marked, the difference between 100, 22 plus or minus two and a half. That means you could have 23 102.5, 106 plus or minus 2.4 That could mean you could 24 have 103.6, so they're the same, same thing in all three of 25 them. So I don't think it shows any difference.
Page 142 1 second one which is the WISC. Let's see which one that is. 2 MR. CARNEY: Wechsler. 3 A Wechsler Intelligence Scale for Children. 4 Q (By Mr. McCrea) All right, sir. Can you 5 interpret -- 6 A They're all the same. There's no change. 7 Q All right. No change in what? 8 A Between the exposed as the control group. 9 Q Okay. And the exposed for verbal IQ, that's 10 the same; correct? 82 to 82? 11 A 82/82. 12 Q The performance IQ, exposed is 90, control is 13 97, seven points higher? 14 A Plus or minus 2.7, plus or minus 2.9. 15 Q Correct. Full IQ, the exposed, 84; control, 16 88, plus or minus 2.9, plus or minus 2.4? 17 A That could be explained. I don't know how 18 long after they did this, whether the children had the same 19 education, whether the children had the same household 20 motivation. I just don't know. 21 Q And on the Bayley test, the exposed, 100; 22 control, 106. Controls tested higher? 23 MR. CARNEY: Let me object. 24 Q (By Mr. McCrea) Is that -- 25 MR. CARNEY: What are the Bayley tests? I	Page 144 1 Q Does that -- Go ahead. 2 A But I think you would want a psychologist who 3 these people are presumably -- I mean, I don't know who 4 they are, but it doesn't look like very much difference to 5 me. 6 Q Okay. All right. And the IQ, 85 to 89; 7 correct? You're familiar with the Stanford IQ test? 8 A Yes. 9 Q In all instances the exposed group had lower 10 scores except for verbal IQ which was identical. Is that 11 correct? 12 MR. CARNEY: I'm going to object to that. 13 A No, it isn't correct. It isn't correct 14 because if you have just the fact that you have a lower 15 score does not mean that's statistically valid. I can't 16 imagine anybody putting this down without having a 17 probability factor on these things. 18 Q (By Mr. McCrea) Well, isn't that discussed in 19 the article? 20 A I don't know. Let's go back to the article. 21 Q All right. Before we do that, can you also 22 then go down the last category which is Rutter? Are you 23 familiar with that, Doctor? 24 A No, I am not. 25 Q In this instance the control group, the

Page 145 1 exposed group had higher scores, more health problems, 2 habits, behavior than the control group. Is that -- Just a 3 second, Tom. Is that a fair analysis of the data? 4 MR. CARNEY: No. I'm going to object here 5 because first of all, the witness doesn't know what the, 6 isn't familiar with that test, and second of all, he's 7 already testified that the control groups, he doesn't know 8 what was involved with the control group, where they came 9 from. So you're asking him to draw a conclusion that's 10 impossible to draw a conclusion on. 11 A And he's got a different control group down at 12 this bottom one. I mean, he's got 109 of 120, and he was 13 talking about 113 all the way along or 106, and now he's up 14 to 120. It's got me completely confused, and I'm surprised 15 "Science" published it. 16 MR. McCREA: All right, sir. 17 MR. CARNEY: Let me just ask you, Mr. McCrea, 18 were those last three pages that you've been putting up 19 there, were they a part of that article? 20 MR. McCREA: He already explained that, Tom, 21 if you were listening. 22 MR. CARNEY: Well, I thought you said all 23 those pages were a part of that article. 24 MR. McCREA: They were blow-ups of the chart. 25 MR. CARNEY: Okay. Well, when you first	Page 147 1 question. You haven't defined your term. It's vague and 2 ambiguous as to what you mean by significant. What type of 3 PCBs? 4 A I suppose if you did absorb -- Are you talking 5 about humans now? 6 MR. McCREA: Yes. 7 MR. CARNEY: I'm going to object. If it calls 8 for speculation, I would object to asking the witness a 9 question that would cause him to have to speculate. If 10 there's no data on it, I would not speculate about 11 something. 12 Q (By Mr. McCrea) You may answer. 13 A Can significant? 14 Q Yes. 15 A It may, but I don't know whether it would or 16 not. 17 Q Doctor, can significant absorption of PCBs 18 result in decreased -- and you'll have to help me out a 19 little bit with these words -- thyroglobulin proteolysis? 20 A That is -- Those are enzymes, and I don't 21 know. I am not an enzymologist. I cannot answer that 22 question. 23 Q Can significant absorption of PCBs result in 24 metabolism? 25 A Can they result in metabolism?
Page 146 1 showed it to the doctor you said all those pages were a 2 part of the article, and now it turns out three of them 3 weren't. 4 MR. McCREA: Well, if you would listen to the 5 testimony, I asked him if the blow-ups at the back were 6 reflected the charts on page two and he said yes, they did. 7 Now, if you'd like to look at them, you may. 8 MR. CARNEY: No. All I'm saying is that I 9 thought this was a six page article. It turns out it was a 10 three page. 11 MR. McCREA: Well, take your time and look at 12 them. 13 MR. CARNEY: No, I already pointed it out to 14 you. You said they were all a part of the article, and it 15 turns out it was just the three pages. You've added three 16 additional blow-up pages. 17 Q (By Mr. McCrea) Doctor, did you understand 18 when you were looking at the charts that the charts up here 19 were blow-ups of the charts on page two? 20 MR. CARNEY: I'm not disputing that. 21 A Yes, I did understand. 22 Q (By Mr. McCrea) Thank you. Doctor, can 23 absorption of significant amount of PCBs result in immune 24 suppression? 25 MR. CARNEY: I'm going to object to the	Page 148 1 Q Altered metabolism. 2 A Altered metabolism? They could result in 3 altered metabolism of the skin. They could result in 4 altered metabolism of some liver enzymes. Whether that's 5 any particular harm or not to the individual is certainly 6 not definite. 7 Q All right. Doctor, can you refer to Exhibit 8 K-2? 9 A If you point it, give it to me. 10 Q Yes, sir, I will. 11 A I have K-6. 12 Q I've got this, a copy of K-2. 13 A Yes, sir, I'm referring to K-2. 14 Q Doctor, you discussed this on direct 15 examination at some length, did you not? 16 A Yes, I did. 17 Q And I believe these workers, to recap the 18 testimony and we're referring to Exhibit K-2, an article 19 title an "An Acneform Dermatogosis"? 20 A Gosis. 21 Q By Jack W. Jones, M.D, and Herbert S. Alden, 22 M.D., Atlanta, Georgia? 23 A Yes, sir. 24 Q Involving workers at the Swann Chemical Plant 25 which was purchased in 1933 or '4 by Monsanto?

Page 149 1 A I think it's later than '34. I think it's '34 2 or '35. I'm not sure. 3 Q All right. And Dr. Jones and Dr. Alden 4 examined these workers and then wrote this article? 5 A Yes. 6 Q You later examined the same workers? 7 A I didn't say I examined them. I said I saw 8 some of them. I observed some of them. I did not examine 9 them. 10 Q I stand corrected. You observed them and the 11 skin conditions had resolved? 12 A That's correct. 13 Q So you, you actually talked to the, some of 14 these workers who Dr. Jones and Dr. Alden wrote about? 15 A Yes, that's correct. 16 Q And in this article on page one which I guess 17 doesn't have a number, but would be, well, for page one? 18 A 1920, yes, is my number on it. 19 Q Okay. It -- In the second paragraph, the 20 second sentence states, "This term chloracne was first used 21 by" -- Is that -- 22 A Herxheimer. 23 Q "Herxheimer in 1899 to describe an eruption 24 composed of comedones." What is that, comedones? 25 A Comedones is a plugged up sebaceous gland.	Page 151 1 "Two patients whose skins were diffusely pigmented." Can 2 PCBs cause skin to be diffusely pigmented? 3 A Then again I don't know what you mean by 4 diffusely. If you -- It can be pigmented in an area of one 5 or two square inches. The ones that I have seen have been, 6 have not been pigmented, but it can. I would imagine it 7 can because chloracne has other things that cause chloracne 8 and have caused pigmentation. 9 Q What do we mean, pigmentation? If you look 10 at -- 11 A It's darker. The skin looks like it's a 12 collection of blackheads. 13 Q Okay. And it says dark, rough and dry, "Whose 14 skins were diffusely pigmented, dark, rough and dry." Can 15 PCBs cause those symptoms? 16 A Well, pigmentation is dark. I mean, that's 17 the same thing. Well, rough and dry, I -- 18 Q All right. 19 A I don't know what the, what he's describing 20 there because if you put paint remover on your skin, you'll 21 get rough and dry. I guess you could get it. By the way, 22 we are talking now about chlorine compounds that were being 23 used 30 years before PCBs were invented. 24 Q Right. 25 A Okay.
Page 150 1 Q And -- 2 A Sebaceous gland is a fatty skin gland. 3 Q Can PCBs cause that? 4 A Yes. 5 Q "And small sebaceous pustules." 6 A That's when the gland gets affected. 7 Q Can PCBs cause that? 8 A Yes. 9 Q What does a comedone like like? 10 A It looks like a white head instead of a black 11 head. 12 Q And what does a small sebaceous pustule look 13 like? 14 A A small hickey. 15 Q Like a little red mark? 16 A Well, a tiny boil. 17 Q All right, sir. 18 A A tiny pimple or it could be larger pimple, 19 but it looks like a pimple. 20 Q "That occurred on the arms and faces." 21 A Yes. 22 Q And can PCBs cause those comedones and 23 pustules on the arms and faces? 24 A Yes. 25 Q Going on down in that same paragraph said,	Page 152 1 Q And my question is not directed to anything 2 other than PCBs. 3 A Okay. 4 Q Fair enough. I understand that. That's a 5 good observation. All right. This paragraph is not 6 talking about PCBs. 7 A No, but I wanted the jury to be clear. 8 Q And I agree. Now, we've just got one minute. 9 Can PCBs cause small tenacious comedones? 10 A I don't know what he means by tenacious. 11 That's -- If he means by that it stays around a long time, 12 that could be true, if that's what he means by tenacious. 13 Q All right. Can PCBs do that? 14 A Yes, sometimes. 15 Q Can PCBs cause follicular abscesses? 16 A Well, if any skin lesion gets infected, one 17 gets an abscess. Follicular abscess is a hair follicle on 18 the skin. 19 Q All right. Can PCBs produce that? 20 A Well, if comedone becomes affected, infected, 21 yes, it can become a pustular. We're just repeating 22 themselves down the way. 23 MR. McCREA: All right. Doctor, we're out of 24 time here. 25 (Thereupon, a short colloquy was had between counsel

Page 153 1 and the witness, off the record.) 2 MR. CARNEY: We've been talking off the record 3 about rescheduling, and Mr. McCrea is not available 4 tomorrow although everybody else would be tomorrow, but we 5 agreed, I think, that we would stop at this point because 6 the studio needs this room and would like this room for the 7 majority leader of the House of Representatives to give a 8 videotape, and so we've agreed to stop now, and the 12th 9 which is a Tuesday, the 12th of June at 9:00 the same place 10 we will finish up the deposition. Is that all right? 11 MR. McCREA: That's correct. 12 MR. CARNEY: Okay. 13 * * * * 14 15 16 17 18 19 20 21 22 23 24 25	Page 155 1 ORIGINAL TRANSCRIPT TAXED IN FAVOR OF: 2 Mr. Thomas M. Carney 3 Husch & Eppenberger 4 190 Carondelet Plaza, Suite 600 5 St. Louis, MO 63105 6 Total: 7 8 Upon delivery of transcripts, the above 9 charges had not been paid. It is anticipated 10 that all charges will be paid in the normal course 11 of business. 12 GORE PERRY GATEWAY & LIPA REPORTING COMPANY 13 515 Olive Street, Suite 700 14 St. Louis, Missouri 63101 15 IN WITNESS WHEREOF, I have hereunto set 16 my hand and seal on this _____ day of _____ 17 Commission expires 18 _____ 19 Notary Public 20 21 22 23 24 25
Page 154 1 COURT MEMO 2 IN THE CIRCUIT COURT OF THE CITY OF ST. LOUIS 3 STATE OF MISSOURI 4 5 Glenn Brown, et al. vs. Monsanto Company 6 862-00694 7 8 CERTIFICATE OF OFFICER AND 9 STATEMENT OF DEPOSITION CHARGES 10 11 DEPOSITION OF DR. R. EMMET KELLY 12 TAKEN ON BEHALF OF THE DEFENDANT 13 6/1/1990 14 Name and address of person or firm having custody of 15 the original transcript: 16 Mr. Thomas M. Carney 17 Husch & Eppenberger 18 190 Carondelet Plaza, Suite 600 19 St. Louis, MO 63105 20 21 22 23 24 25	

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