6/28/88 4 pgs. sent to DL Kelley in Juneau that entire trans. will be circulated to him to read if he would like to see all of it.

UNITED STATES DISCTRIT COURT
NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

- - -

HERMAN A. DENDINGER, et al.,)

Plaintiffs,)

vs.)Case NO. C84-7854

CHRYSLER PLASTIC PRODUCTS CORPORATION, et al.,)Hon. Nicholas J. Walinski

Defendants.)

- - -

Deposition of ALAN S. TODD, a witness herein, called by the Defendants as if upon Cross Examination under the Federal rules of procedure, taken before me, the undersigned, Casey Gotthart, a Notary Public in and for the State of Ohio, at the offices of Murray & Murray, Murray Building, Sandusky, Ohio, on Monday, April 25, 1988, at 10:00 a.m.

- - -

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720 SECURITY BUILDING
TOLEDO, OHIO 43604
(419) 255-3040

I N D E X

EXAMINATION

- - -

OBJECTIONS

- - -

EXHIBITS

- - -

APPEARANCES:

On behalf of the Plaintiff:

MURRAY & MURRAY:
By: Kirk J. Delli Bovi

On behalf of Defendant Schulman Corporation:

MANAHAN, PIETRYKOWSKI, BAMMAN & DELANEY:
By: H. William Bamman
and
Larry P. Meyer

On behalf of Defendants B.F. Goodrich, Co., Conoco, Inc., Diamond Shamrock Corp., Firestone Tire & Rubber Co., Occidental Chemical Corp., Goodyear, Inc., Tenneco Oil Co., Union Carbide Co., Uniroyal, Inc.:

FULLER & HENRY:
By: Robert A. Bunda

- - -

ALAN S. TODD,

a Witness herein, called by the Defendants as if upon Cross Examination, being first duly sworn, as hereinafter certified, was examined and testified as follows:

CROSS EXAMINATION

BY MR. BUNDA:

Q Mr. Todd, my name is Bob Bunda. I represent some of the Defendants in the PVC case that you're here to testify on today.

I think the record should reflect that the

deposition is by stipulation of counsel pursuant to an original subpoena for Mr. Todd. That subpoena noticed the deposition for an earlier date, and we rescheduled it for a time more convenient to everyone involved; is that correct, Kirk?

MR. DELLI BOVI: Well, I'm not sure it's pursuant to the subpoena. I've never seen the subpoena, but certainly it is to the date and the place and the time. It is by agreement.

BY MR. BUNDA:

Q. Mr. Todd, would you please state your full name and business address for the record?

A. Alan S. Todd, and the company is Stewart-Todd Associates, Inc., 1016 West Ninth Avenue, King of Prussia, Pennsylvania.

Q. Mr. Todd, you received a subpoena in connection with these matters at one time, didn't you?

A. I believe that's correct. It must be quite a while ago. That's why I'm saying "I believe" it's correct.

Q. Well, the reason I'm saying that is because attached to a subpoena is a request for certain documents.

Have you brought certain documents with you today?

A. I would say yes without fear of contradiction.

Q. Well, you have a file of stuff before you. You've brought these from your own files, or are these things that were here at the attorney's office?

A. These are from my files. A good many of them were submitted, of course, by the attorney to me.

Q. We will get into that in a few minutes. Before that, I'd like to get a few preliminary questions.

I'm going to hand you a curriculum vitae of yours which was used in a deposition in a PVC case in December of 1987. Is that a current curriculum vitae, or are there changes that have to be made to make it more current?

A. Basically correct. It may be out of date, because I don't update them that often, but it's reasonably correct.

Q. Let me ask you, what corrections would you need to make it updated?

A. Oh, if anything, perhaps, anything that I've recently published may not necessarily be included there, but other than that, basically, it's a good summary of my experience and so forth.

Q What have you published that's not in there?

A I've published an article on PVC's and some of the wood preservative compounds over the last four or five years. I think that covers most of my publications in that time frame.

Q Are those two separate articles, or are they --

A Yeah, they're separate.

Q Those are two articles or one?

A Actually, I think there's a series of them on wood preservatives, and there's one on PVC's.

Q And where was the series on wood preservatives published?

A It's in NTIS, National Technical Information Services, now of NIOSH, and the PVC's in the ASHRE proceedings of, I think, '87.

Q Are you saying "ASHRE?"

A ASHRE, American Society of Heating and Air Conditioning Engineers, A-S-H-R-E.

Q That's a regular journal of theirs, or is that something --

A That's regular proceedings. It's an annual proceeding, I believe.

Q It's not a journal, though?

A. No, I think it's strictly a proceedings. I don't know whether they have a journal or not.

Q. Are you familiar with a process where there is peer review of materials submitted for publication?

A. Sure. I've submitted some things for peer review.

Q. Have you had anything published that has gone through this peer review process?

A. I have some publications which are quite antique now, probably 15 years or so back, going on back, perhaps as many as almost 30 years.

Q. This was when you were working for the drug companies?

A. Drug companies or the oil companies -- well, oil companies.

Q. How many articles have you had published that have gone through the peer review process?

A. I would guess on the order of a half a dozen.

Q. None recently; is that right?

A. No, the -- well, the ASHRE article went to a review committee. I don't know that you would necessarily call it a peer review in a strict sense.

Q. And the NTIS doesn't go through any such

procedure, does it?

A. That goes through a NIOSH review committee. It's probably analogous, too, but it's an intragovernment review rather than a total peer review cross section.

Q. Have you ever published anything on polyvinyl chloride or vinyl chloride?

A. No, I have never published on VC or PVC.

Q. How many times have you been deposed in connection with your work as a consultant?

A. At least 50.

Q. And how many times have you testified at trial in connection with your work as a consultant?

A. I would estimate at least 20 times over the last 15 years.

Q. Can you give me some idea of how that breaks down between -- well, let me back up for just a second. Did these involve Worker's Compensation cases, or are these other types of cases?

A. Both.

Q. Can you give me some idea of roughly the percentages between Worker's Comp and other types of cases?

A. I would have to estimate that probably half of them are Worker's Comp and half are not.

Q. Both Worker's Comp and the other types, do they involve chemical exposures, or are there other types of cases mixed in?

A. To a large extent, they're chemical. There are occasionally physical agents involved.

Q. When you say "physical agents," are you talking about noise --

A. No, radiation, a number of others, heat, so forth.

Q. And of the Worker's Comp cases and the other types of cases, can you give me a break down as to how many times or what percentage, however you want to do it, are for the Claimant or the Plaintiff, and how many times for the Company or --

A. I'd have to give you an approximation, about 60 to 70 percent for the Defendants, and the remainder for the Plaintiffs.

Q. In the past year in your legal-related work, has that percentage remained the same, or has that changed?

A. No, pretty much the same.

Q. And as your work -- in your work as an industrial hygienist, can you give me some approximation as to how much of your time is spent in legal-related matters versus just

industrial hygiene consulting, per se?

A. Maybe an outside maximum, 15 percent. It will vary from month to month, but as a maximum, 15 percent.

Q. Fifteen percent is related to legal matters?

A. Yes, and that's probably on the high side.

Q. When you are involved in consulting with an attorney regarding a legal matter, what are the charges that you had?

A. You'd almost have to ask my administrative assistant. I'm not a walking encyclopedia on the fees. I know we have a graduated fee schedule, but I don't approach the figures.

We have one for field survey work; we have one for legal reviews, and one for trial or depositions. I'm not a walking encyclopedia on those, because we've grown a lot, and that responsibility has been turned over to others.

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A. I don't recall, no.

Q. Do you have any idea what -- how much you've charged to date for your work involved in this particular case?

A. I wouldn't have the vaguest notion. I've got an administrative assistant who can tell you that, but I cannot.

Q. What has been your involvement in this particular case to date?

A. Well, initially, I would provide a lot of background information both in terms of documents and depositions. A plant site visit to the Chrysler facility was made last fall sometime, and additional documents have been provided since, and I basically reviewed them, and on occasion, have spoke to Kirk, some of the other members of the firm here regarding these documents and general background information. That's pretty much it up to this point in time.

Q. You've supplied them with documents out of your files?

A. I don't believe I supplied them with any documents at this point out of my files.

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Q. How many legal matters have you consulted on that have involved vinyl chloride or polyvinyl chloride?

A. A few to several, and I really couldn't quote you a better number than that.

Q. Can you describe those for me at all?

A. Well, let's see if I can remember the more recent ones. You're probably familiar with the Celanese PVC related cases, that's PVC and AES both.

Q. Are they the ones --

A. At least some of those cases arose in Columbus, Ohio. Those are in Columbus. I'm trying to remember some of the cases. It seems to me there was a case a few years back, and I'm trying to remember the details of that. Well, I'm going to have to hold this -- that's the one that sticks in my memory, because it's fairly recent.

I know there have been other ones where polymers, where PVC's, I'm thinking now of some of your meat wrappers and similar asthma cases, where you have not only PVC, but polyethylene and some of the other polymer materials.

Q. Have you been involved in any cases involving cancer besides this one and the Columbus case?

A. You mean involving cancer, per se?

Q. Yes, sir.

A. From anything?

Q. No, no. I'm talking specifically with regard to the PVC cases?

A. Okay. I don't believe so, but I'm not absolutely certain on that. Again, 15 years in the consulting business is a long way to go back.

Q. Do you remember where those cases involving meat wrappers asthma or pulmonary problems arose?

A. I know one was in Pennsylvania. I believe another one was in Michigan or somewhere in the midwest, and one was in the far west, and I don't recall where or if there were others.

Q. The Philadelphia case, was that in the -- or the Pennsylvania case, was that in the Philadelphia area or --

A. No, that was in the Scranton geographical area.

Q. The Michigan case was around Detroit?

A. I believe so, I'm not positive. That goes back quite a few years.

Q. Do you remember any of the attorneys involved?

A. No. I'd have to look it up. It's too many years ago.

Q. And were you -- which side of the case were you on in those three?

A. In the Pennsylvania case, I was working for the -- the Defendant, and I believe in the other two cases, for the Plaintiffs.

Q. Who were the Defendants in the Scranton case?

A. Both the supplier of the film and the plant itself, and I can't remember the name of the plant just off the top of my head. It's a food processing plant where the film was used for shrink wrap purposes.

Q. The actual manufacturer of the wrap was not involved?

A. I don't know whether they were involved in the legal proceeding or not, because that started out initially as a Comp case, and I don't know if that went on to civil suit or not.

Q. Do you remember who the manufacturer was?

A. No, I wouldn't remember without looking it up.

Q. The Columbus cases that you were working on, that involved Mr. Delli Bovi's firm as well; is that right?

A. That's a Murray & Murray case, that is correct.

Q. When did you first begin consulting with the law firm of Murray & Murray on these particular PVC cases,

and when I say "PVC cases," I -- perhaps you've --

A. You mean the Chrysler cases?

Q. Well, perhaps you can, in your answer, explain to me, did you start working on the Chrysler cases or the Celanese first?

A. I think Celanese first, to answer your question. Without looking back at my Celanese files and so forth, I would think it would probably be late '86, perhaps early '87.

Q. When did you start on the Chrysler cases?

A. Sometime in '87, and I would think it would have been either late spring or summer.

Q. Do you have any understanding as to how the Murray & Murray firm came to you originally to work on the Celanese cases?

A. I don't know, I really don't know whether somebody referred them to us or what, because we don't actively go out and advertise for that sort of thing. Most of them are referrals, and I don't recall who may have referred to us.

Q. In connection with your deposition here today, did you talk with anybody besides the attorneys from the law firm here about the deposition?

A. I'm not sure I understand the question.

Q. Well, I'm not permitted to go into your discussions with your attorney. I guess what I'm asking for is in preparing for the deposition, did you talk with anybody, to begin with, in your firm about the deposition?

A. Other than my administrative assistant, no, not really.

Q. You didn't consult with -- is Mr. Stewart still involved in your firm?

A. Well, Dr. Stewart -- Dr. Stewart's a physician.

Q. I'm sorry.

A. Yes.

Q. Did you talk with Dr. Stewart about the deposition?

A. Have we talked about -- no.

Q. Have you talked with Dr. Stewart about the Chrysler cases at all?

A. I may have, at some point, had a discussion here or there with him, that's very possible.

Q. Do you know what that discussion may have been about?

A. Not specifically.

Q. Generally?

A. Well, I know periodically we tend to review what we're doing and if we're involved in legal cases, discuss them only to get the point of view of the other professional staff. How in depth that discussion might have gotten, I can't recall. It certainly wasn't a recent discussion.

Q. To your -- I'm sorry.

A. Above and beyond that, I can't give you any information.

Q. Do you recall what Dr. Stewart communicated to you during this deposition?

A. I don't even recall how in depth the discussion was, whether he gave me any input at all. Again, we haven't been asked to specifically address the medical aspects in this case.

Q. That would be his area of expertise, though, would be the medical aspects; is that right?

A. That's correct.

Q. Do you recall whether he communicated to you anything about the medical aspects?

A. Not really. Again, we weren't asked to get involved on an in-depth basis from a medical standpoint. I gather there are others who have provided that sort of expertise.

Q. I understand that, Mr. Todd, but I thought with your discussions, sometimes even though you're not asked to, he may volunteer things, and I guess that is what I'm asking.

A. Well, it's possible he may have, but I don't recall what they may have been, so I can't say one way or the other.

Q. Other than the people in the firm, did you discuss this case with anyone else besides Mr. Delli Bovi's office in preparation for this deposition?

A. No, not really, huh-uh. I don't have any confidants professionally or otherwise that we discuss it with.

Q. Did you review any documents in preparation for the deposition?

A. Well, originally, I reviewed all of these documents you see before the hearing. I didn't review them all yesterday, obviously. It would have been a long Sunday.

MR. DELLI BOVI: Bob, just so we're clear on one of your prior questions, you asked Mr. Todd today whether or not he had discussed the deposition today with

anyone. Just so we're clear, he has had discussions during his tour of the plant with people in the plant, and those discussions did not relate to this deposition.

I just wanted to make sure that nothing got lost between your question and his answer.

MR. BUNDA: Okay, I understand. Thank you.

MR. DELLI BOVI: Sure.

BY MR. BUNDA:

Q. In light of Mr. Delli Bovi's comment, then, let me expand the question beyond just in preparation for the deposition. In conducting your -- or meeting the charge that came from Mr. Delli Bovi's office in connection with these Chrysler cases, other than the people in his office, who have you talked to?

A. Specifically about this case?

Q. Yes, sir, or in preparation for this case.

A. Except for perhaps in a cursory fashion, really nobody. I occasionally discuss aspects of a case with some of our staff, only because they may possibly have

some experience or insight which would be helpful. I can't recall specific discussions, if I've had them along the way, as I've reviewed certain documents, but I have people on staff who have much more experience in specific segments in the industry than I do, or in some cases, a specific polymer chemist and so forth who can provide me with insight, but in terms of any discussion, say, within the course of the last two weeks with them, no.

Q. Extending it beyond the last two weeks, when you were asked to consult on this case, did you have such discussions with anyone in your organization?

A. I probably have at one point or another. How in depth they got, I don't recall.

Q. Do you remember who these discussions were with?

A. Not specifically, because, again, they tend to be more of a spontaneous sort of thing, as you go through documents and somebody walks in, quite often we would discuss them, call it an informal bull session as it were.

Q. In the course of those discussions, did you obtain information which you believe has helped you in your understanding of this case?

A. Maybe insight or a little -- maybe a little fundamental knowledge here and there.

Q. Well, can you explain that for me a little bit? What was the insight or fundamental knowledge that you received?

A. Well, I'm not a polymer chemist, and I have an I.H. who works for us who was a former polymer chemist, and I occasionally would have a discussion with him. He's no longer one of our employees, but I can access to him, and when we get into polymer chemistry, I will ask him a question here or a question there, and his experience will go all the way back in the 1950's. He occasionally will provide useful information above and beyond what you can glean from depositions and articles.

Q. And what is his name?

A. His name is Richard Cassar.

Q. You said he is not an employee of yours?

A. No, he used to be. He is an industrial hygienist, but he is no longer. He's a self-employed consultant.

Q. Spell the last name, please?

A. C-a-s-s-a-r.

Q. a-r?

A. a-r.

Q. He's an independent industrial hygienist now?

A. That is correct.

Q. And where did he get his knowledge of polymerization chemistry?

A. Well, he basically was a research chemist for Sun Oil Company for approximately 20 years or perhaps a little longer,and one of his major areas of interest was in polymers. Sun, at one point in time, owned several patents, as well as having production facilities for both monomers and polymers, not specifically PVC, whether they gotten involved in mixed polymers with PVC, but they, he manufacture ethylene and similar monomers.

Q. Of the polymers he was working with at Sun Oil, you mentioned ethylene. That's a monomer.

A. Well, he's worked with almost all the monomers.

Q. How about vinyl chloride?

A. He's worked with vinyl chloride. He's worked with ethylene, styrene, betaine. I don't know if he's worked with acrylonitrile or not. I would be a little surprised if he hadn't at one point, and I gather he has also worked with some of the fluorocarbon materials, those with teflon in and other products.

Q. And this was in research with Sun Oil?

A. Yeah. He is basically a research chemist who devoted a lot of his time to polymerization-type products.

Q. This was in connection with what, now, with Sun Oil providing monomers, or with Sun Oil going into the polymerization business or what?

A. Sun Oil, at one time -- well, still does produce ethylene monomers. I'm not sure whether they produce presently at this point in time, but they may very well--but at one point in time, were interested in the polymer business, and, as a matter of fact, were co-owners of a polymer plant. Now, that plant was later sold, I think, in the early to mid '70's.

Q. What kind of --

A. I think Standard of Indiana bought it out, Amoco bought it, to my recollection, if I'm correct.

Q. What kind of a polymer plant was it?

A. I'm trying to remember. I can't recall.

Q. It wasn't --

A. I have a feeling it was a mixed polymer plant, but I can't recall the details, because it's too far back.

Q. Did it involve polyvinyl chloride?

A. I'm not sure whether PVC was part of that

process. They had also had some other processes they were working on with FPC Corporation, which I think they patented, but at least Sun never commercialized them, but whether somebody else commercialized them, I don't know.

Q. This was during the time that you were working as an industrial hygienist for Sun Oil?

A. Prior to and during, as well as sometime after I left Sun Oil.

Q. Did you have an opportunity to visit the polymerization plant?

A. No, that was a jointly-owned plant, and I guess industrial hygiene expertise was provided by the main owner. I think Sun Oil had something less than 50 percent of that plant.

Q. Do you remember who the other owner was?

A. I think it was FPC, but I wouldn't swear on that.

Q. Other than the people in your organization, have you talked with -- well, let me break this down a little bit for your help. You've talked to people at the Chrysler plant; is that right?

A. That is correct.

Q. Who have you talked to there, and I realize

it's difficult for your same -- perhaps you can describe them by job description.

A. Well, we're talking -- was that the basic plant management this morning?

MR. DELLI BOVI: Just answer his question.

A. I have a very poor memory for names. I'd almost have to go back and reconstruct that for you.

Q. How many people have you talked to out at the plant?

A. In total, half a dozen, plus or minus one or two.

Q. You came out and visited the plant. When was that, a couple of months ago?

A. I think it was last fall.

Q. And what was the purpose of that visit?

A. Again, I wanted a familiarization of the basic areas, which, at that time, I understood the two individuals worked at.

Q. Do you remember how many people you talked to at that plant at that visit?

A. Three, maybe four.

Q. Did you meet with a gentleman by the name of

Chet Ferguson, then?

A. Yes, as a matter of fact, that's the same person we met with this morning. I'm not sure of his title.

Q. Did you meet with a gentleman who was the plant chemist at that time?

A. This isn't Slautter I assume you're referring to?

Q. No -- well, I think Hans Slautter was, yes.

A. I don't recall Slautter, but I believe from his depo that he's German in origin, but I don't recall anybody with that distinct accent, but I don't think that's the case.

Q. Do you recall from job descriptions who any of the other people were?

A. No. I gather some of them were directly involved in the process, and probably middle management, supervisory people.

Q. Did you talk to any of the production workers?

A. I guess you'd say at a supervisory level. I have watched a number of employees, but I didn't specifically ask questions of individual employees on how long does this take or how long does that take and so forth.

Q. Have you ever talked to any production workers

out at the Chrysler plant?

A. Directly? You mean outside of that visit?

Q. Yes.

A. No, I've had no conversations with anybody directly out there at this point in time.

Q. Do you have any plans to?

A. It's conceivable of what I add to the store of information that you might need in preparation for a trial. It depends upon whether there's individuals who go back far enough to the point in time who would -- who have enough basic information that would add to what we already have.

Q. Well, in your response, you said it was "conceivable." I guess my question is do you have plans now to ask to talk to anyone, or would that information be something that you would need before you could testify?

A. It would be helpful if, again, somebody there -- there's still somebody there who has first-hand knowledge above and beyond what's reflected in the deposition. Remember, there's complete lack of any hard data pre-1974 in terms of exposure to essentially anything.

Q. All right. I want you to understand my question, though, Mr. Todd. This is my opportunity to sit down and

talk to you, and if you gather information, then, after this, I'd like to know what that is or when that's going to happen, so I guess I'm not asking what would and wouldn't be helpful, but I'm asking you, as you sit here today, is there information that you're going to be asking for that would contribute to your knowledge about the case?

A. It would be useful to get what you're inferring. Whether there are people at the plant who date back to that era, who have sufficient knowledge to add to what we have now, I don't know, but I won't rule out the possibility of doing it.

Q. You haven't, at this time today asked to see or talk to people from the plant?

A. That's correct, I have not, up to this point in time.

Q. And you don't have any current understanding right now that that's going to be supplied to you unless -- if you need it in the future?

A. That's basically correct, if it would be somebody that would add to our store of knowledge, then, again, I may ask for it.

Now, it may be an exercise in futility, because they may come back and find out there's nobody who has any

real familiarity on a worker level dating back to 1974, in which case, the excursion you're planning isn't possible, because they're just not there.

Q. After reviewing the documents, you don't have any present intent to ask for someone, for example, from the Ink Room or some other area of the plant?

A. No, I wouldn't say that's the case at all. There's a lot of missing information, and you've asked me to depict risk not only 10 years ago, but essentially 20, and at least in the first 8 or so years, there's absolutely no hard data, and, therefore, you've got to put the puzzle together as best you can, so the more information you've got, the better off you'll be.

Q. What is the missing information that you're talking about?

A. Well, at least the data I've seen, there's no records indicating exposure to monomers of any type preceding 1974.

Q. I'm sorry, any exposure what?

A. Any exposure data to vinylchloride or anything else pre-1974. Okay. The first monitoring appears to have occurred sometime in mid to late 1974, and even then somewhat sketchy in terms of details.

Q. Do you have any present idea about how you would go about getting that information or attempting to get it?

A. Well, above and beyond trying to make estimates from our current understanding, ideally what you'd like to have is somebody who not only knew the individuals in question, but actually had some direct familiarity with the tasks they did and the type of materials they handled, the quantities, and so forth and so on, as well as any subjective, for what they're worth, evaluation of dust exposures and odor levels and so forth and so on.

Q. Well, correct me if I'm wrong, but what we're concerned with here is exposure to a gas, not to dust; is that right?

A. Well, you really have PVC dust as well as vinyl chloride monomer itself as the gas.

Q. But we're in agreemment that exposure to PVC dust, as a dust, is not known to be a carcinogen. It's any vinyl chloride monomer that's contained within the dust; is that fair?

A. That's true, we agree that truly polymerized material does not appear to be carcinogen; nevertheless, the polymerized material contains unreacted monomer, and

if you inhale a dust, it is unlikely that that material is going to escape other than to the systemic system itself.

It's going to gradually degas off there inside the body, and, therefore, result in direct systemic exposure, so that is going to add to any direct airborne VC that you may get as a result of working in proximity to the PVC or whatever the process may be.

Q. This inhalation of the dust depends upon -- okay, let me change that question, then, if I can.

The inhalation of the dust is important only insofar as a content of the vinyl chloride monomer; is that correct?

A. Basically.

Q. We're not talking about levels of dust that are so high here that they will contribute to like a nuisance dust type of situation?

A. I don't know -- when you say, "nuisance dust," and that,that is used in one fashion in professional circles, and in another fashion in nonprofessional circles.

Q. But you understand what I mean by that?

A. Well, I think I know what you mean. Maybe you need to clarify.

Q. We're not talking about dust exposure here

that would contribute to a dust-type lung disease?

A. No, we're not talking about a lung disease from, in quotes, the "PVC dust," per se, although there's some indication in the literature of disease entities from PVC dust. That's more recent literature.

Q. But that is not involved with these two gentlemen; is that your understanding?

A. That's my understanding at this point.

Q. Okay.

A. All I was saying earlier was any potential vinyl chloride in that dust systemically would behave the same as though they inhaled it directly as the airborne gas.

Q. Now, let me see if I understand your charge in this case. You mentioned earlier that you are -- you have been asked to look at -- at what?

A. Basically what these individuals worked with; what sort of work practices were used; what sort of ventilation was in existence there as a function of time; and as best we can, try and depict what they were exposed to in order of magnitude.

Q. Now, you mentioned earlier that you were not asked to look at the medical aspects of the case; is that

right?

A. We weren't asked to specifically relate the specific disease to a specific material or a mixture of materials; that is to say, draw a cause-and-effect conclusion from a medical standpoint.

Q. So I would be correct in presuming that you're not intending to testify at trial as to whether the vinyl chloride caused the cancer in these two men?

A. That's a medical expert.

Q. Well, as an industrial hygiene expert, are you prepared to testify to that?

A. Well, that's a gray area. You get the question of how in depth you go. There is a point where industrial hygienists can't make a diagnosis.

Q. Well, I understand that, Mr. Todd, but you can form opinions as an industrial hygienist regarding whether certain exposures contribute to certain diseases; is that correct?

A. That is correct.

Q. Are you going to do that in this case, to your understanding?

A. Perhaps in an indirect fashion, yes, that may very well be done, because, again, we get back to the fact

of how much do you know about the material as a function of time, and how do you react accordingly in terms of trying to reduce health risks to people who may have potentially been exposed.

Q. Well, I understand that, but I've asked you to expand a little bit upon your answer "In an indirect fashion." I don't understand exactly how you can testify concerning whether there is a dust exposure and so on and so forth unless you relate it to a specific disease -- let me withdraw that question. That's too long.

Explain how, in an indirect fashion, you're going to testify on causation?

A. Okay. Let's see if I can. Maybe you better -- maybe you better repeat the question, be a little more specific, because you're almost asking for dissertation, and I don't think I'm prepared to give you an extended, lengthy -- see if you compartmentalize that question a little bit for my benefit.

Q. Certainly. One of the issues in this case and in these other cases is whether the material caused the injury to the person who is bringing the lawsuit. You understand that, correct?

A. Well, yeah, the question really becomes what

do you know about the material you worked with as a function of time as to their biological or possible biological effects; what do you know about the order of magnitude of exposure; what do you know about what was done as a function of time to minimize that possibility; and now is there possible interaction effect that comes into play.

Q. And you are prepared to testify as to that?

A. To the extent that I can, yes.

Q. Are you prepared to testify as to whether the exposure to vinyl chloride monomer or polyvinyl chloride had a cause-and-effect relationship with the cancers involved in these cases?

A. In a probable sense, yeah.

Q. In an absolute sense, I think, as any area of science, you can't give an absolute, but probable?

A. Yes.

Q. Well, I'd like to get back to that in a minute, but I'm going to try and keep this in some sort of sequence. Have you talked to anyone besides the people in your facility or your company and the people out at the plant concerning the aspects of the case that we were just talking about, what I would term the "causation issue," or with regard to any other issues of the case?

A. Well, again, I'm going to have to give you the same response that I did earlier. If I did, I don't recall it. I'm not sure that I did.

Q. And what texts, medical articles, Chrysler documents, your own files, or any other documents have you reviewed in your preparation for this case?

A. Well, there's a pile of discovery documents here which have come out of both Chrysler and PVC manufacturers, plus a few scientific articles. There's some information on some of the processing areas and ventilation aspects, as well as volumes of materials purchased from various supplier sources over the time period roughly of eight, ten years, twelve years, and it is voluminous.

Q. Let's go through those in a second. Have you done any review of the industrial hygiene literature concerning vinyl chloride or polyvinyl chloride?

A. Oh, I have some of it right in the office, and general solicitations from Patty's and TLV documentations and so forth. Obviously, we have access to all the computerized aspects, certain cancer lines and toxic lines and so forth on our own computer system.

I haven't gotten to those, again, primarily

because I wasn't asked to look at the pure medical aspects in terms of cause and effect. My understanding is that's someone else's area of responsibility.

Q. All right, so you have not looked at Patty's to determine the --

A. I said -- I didn't say I hadn't looked at Patty. I said I hadn't looked at the computer. That was what was ambiguous about your question, you said, "You have looked at the Patty." I have looked at some of the Patty and TLV information.

Q. What else have you looked at?

A. In terms of pure toxicology?

Q. Yes, sir.

A. I really haven't gone beyond that, and, of course, some studies require incorporated into -- I should say summaries of the Maltoni and the IBT evaluations. Now, they're summaries, but the actual, in depth raw data I haven't gone back to.

Q. What is the IBT information?

A. Industrial biotest, that is the information of 1973, approximately.

Q. Where did you get the industrial biotest, the Maltoni and the Viola or any of the medical articles that

you have seen?

A. I think they were supplied by Kirk.

Q. By the attorneys for --

A. At least the summaries of those.

Q. By the attornies for the Plaintiff?

A. I believe so, yeah, either that, or they were in some of the depositions of Defendants' witnesses.

Q. You have not gone out and done a review of the medical or industrial hygiene literature on the issue of causation; is that right?

A. No, that's correct, at this point in time I have not.

Q. Do you have any plans to do that?

A. I don't know. Again, it depends upon how the attorney wants to coordinate his case. You know, I don't know all his experts and where their conversations were going and how he's going to impact it.

Q. Your understanding of your charge at this time is that you would -- you have not been asked to date to testify as to the medical causation issue?

A. That is correct.

Q. By the way, do you know Dr. R. Michael Kelley?

A. I have heard the name, but I can't place the

name with an organization.

Q. Have you ever met him before, to your knowledge?

A. I don't recall the name. Again, I have a very poor memory for names, so I wouldn't swear I never met him, but it does ring a bell.

Q. Do you recall when you looked at Patty's what was indicated with regard to the medical causation of cancer and vinyl chloride?

A. Well, there's a clear cut, of course, relationship with angiosarcoma, and I think that's pretty conclusive, and, of course, some of the obvious acute or less -- or I should say more subtle effects beyond angiosarcoma.

I'd actually have to go back and read in detail -- I don't -- I know they discuss some of the animal toxins they gave in regard to other type cancers. I don't recall them going into a whole of of depth in terms of epidemiology studies to confirm or not confirm those.

Q. Have you seen any of the IARC publications on vinyl chloride?

A. No. I have access to them, but I haven't seen the latest ones. I assume they probably classify it as a noncarcinogen, but I haven't seen the details right up on

the --

Q. You have seen the threshold limit value documentation on vinyl chloride; is that right?

A. That is correct. I don't think that's changed since, I don't know, '75 or '76 or somewhere in that general time period.

Q. Have you seen the medical records of either of these gentlemen?

A. I have, but it's been quite a while, and, again, I wouldn't have gone into any great big detail as a physician who was addressing the medical details. A little bit is beyond my area of expertise, but more importantly, I wasn't asked to look at the records. I've seen them, but I didn't go into great details because I wasn't asked to look at them as a medical expert.

Q. You understand that Mr. Dendinger died of colon cancer?

A. That I believe from recollection, I believe he died from a colon cancer.

Q. Do you understand that Mr. Wallace died from a mucoepidermoid carcinoma that they believe the primary was in a parotid gland?

A. That's my recollection.

Q. From your review of Patty's or your review of the other things that you have seen, have you seen any information that would lead you to believe that vinyl chloride has been associated with either of these two types of cancers or locations of cancer?

A. From recollection, above and beyond the animal studies, I don't believe Patty goes into anything other than the basic angiosarcoma phenomenon in man.

Now, again, recognizing Patty isn't updated each year either and without looking back on my Patty, which is the most recent decision, I'm not sure even that it was actually within that --

Q. You referred to Patty's in the past as being the bible of the industrial hygiene profession; is that right?

A. It's probably one of the best summary-type documents for looking up information on all materials for which we have a reasonable amount of scientific information where these are used in industrial settings.

Q. And that's where an industrial hygienist first goes to when you first get information about possible exposure?

A. It's a good summary source. It's a good

starting point.

Q. And that's updated from time to time, isn't it?

A. From time to time. I wouldn't swear on the frequency because it's getting to be -- it went from two to, what, six volumes, seven volumes now, and you always have the problem in writing a multi-authored book of that type of trying to get your authors to update their sections, or if they're too busy, get somebody alternatively to do it. Subsequently, I doubt that the updating is going to be all that frequent above and beyond the simple corrections or maybe additions, or when brand new information comes along in a specific area or with a specific chemical.

Q. Along that line, there is an update, from time to time, of information regarding various questions?

A. That's basically true. That's what ACGIH does, and TLV does that.

Q. They do that every year?

A. They do it in theory every year. They don't necessarily do an indepth updating of every material every year, at least on paper they do, but in reality, that's not always possible, and sometimes it's not necessary,as well.

Q. Well, that's what my next question is, if something arises which gives them reason to believe that

it needs to be reviewed and updated, then they examine that particular material; is that correct?

A. Yeah. If something appears in the scientific literature, or they receive specific comments from various and sundry sources published or otherwise, then they will continue to review it.

If there is nothing that either appears in the scientific literature or otherwise, I imagine -- I imagine the review tends to be cursory.

Q. Because there's nothing to indicate that it needs to be reviewed at that point in time?

A. Basically.

Q. How many TLV's does the ACGIH come up with?

A. I would presume, without having counted them, somewhere between 5 and 600. That's an approximation on that on my part.

Q. And this is a volunteer organization?

A. It's a professional organization. I don't know that you call a professional organization volunteer. None of us could contribute to the --

Q. Let me change my question, then. The members of the TLV committee are not paid any money to sit on that committee.

A. As far as I know, they do it for the glory. I believe in many cases, their employers, state, county, federal, academia and so forth help pay some of their costs for travel and so forth, but they weren't paid a fee, as it were, by the hour, week, month, or otherwise.

Q. And those members of that committee are the ones doing the review of the TLV's, is that it?

A. They were basically reviewing the TLV's on a periodic basis.

Q. Well, my point is that it's difficult to get a professional organization with volunteers sitting on a committee to sit down and review some 600 chemicals, that you have to look at the ones that are indicating the need to be changed, and you leave the others until some information comes along indicating that it needs to be updated.

A. I agree. What you're saying is that, in fact, the TLV documentation isn't necessarily all the potential available information at one point in time, but it's the best we can do with a volunteer - type organization, so I agree with it.

Q. The ACGIH stands for the American Conference of Government and Industrial Hygienists.

A. That's correct.

Q. In order to be a member of that, you have to be a government industrial hygienist or be in academia.

A. Yeah, you have to work for an agency or be in academia. An example would be someone in the automobile industry who was a consultant to them, and maybe members of the industry, but they're not members of the actual committee. I believe -- I'm not positive, but I believe if you leave academia or government, your membership in the ACGIH, at least in the past, has either disappeared, or you've taken a secondary role.

Q. To be a member in that situation, to be a full, active member, you can't be employed by private industry?

A. At least in the active review process, you can't, because of conflict of interest.

Q. So these are government industrial hygienists that are setting these standards?

A. Governmental or academia.

Q. You're not a member, are you?

A. No, again, I'm not. I don't think you could be a private consultant, simply because you'd probably, at one point in time, have a conflict.

Now, I know a few private consultants who do

consulting work for ACGIH, but they are not members.

Q. In your practice, you use the threshold limit values, don't you?

A. I quite often use the TLV values.

Q. I don't know whether you know this or not, but let me ask the question: As a matter of fact, when OSHA first started out, the purpose of OSHA was to get their own governmental standards; is that right?

A. From a legal standpoint, you're correct. Actually, when OSHA first went into existence in December of 1970, even though the statutory requirements required adopting consensus standards, there was a general trend saying, "Well, let's just publish the ACGIH TLV's, and we will take them."

However, there was a court case on that, sort of a subtle reminder to OSHA as to what their limitations were in terms of accepting consensual guidelines versus consensus standards, and so, subsequently, OSHA was forced to adopt, basically, 1968 or 1969 TLV lists, plus some additional -- some additional ones from other sources.

Q. Well, I think you said "forced" to do that.

A. They were forced to do that legally.

Q. As a matter of fact, they were looking to do

that anyway, weren't they? You were referring to ACGIH standards when they first began, because there was all these chemicals out there.

A. Well, yes, that is what happened, and they had to cast in concrete, I think it was, 1969 or 1970, the TLV list, and in some cases, that has varied dramatically over the almost 20-year time period that we're talking about.

Q. But they picked up the ACGIH standards when they first began.

A. Got it only in part. They actually accepted some of the other recommendations of the other consensus groups. For example, on benzene they didn't use the ACGIH limits. They used -- I'm trying to remember the name of the organization and I can't any more, but they used a more restrictive number. They had the option of picking up any consensus then, and they sort of amalgamated those.

Q. Do you have any idea what percentage of these standards were ACGIH standards when you first began?

A. If I were going to guess without looking back on it, I would say probably 85 percent of them were ACGIH.

MR. DELLI BOVI: Could we take a break for about five minutes?

(Whereupon, a brief recess was taken.)

BY MR. BUNDA:

Q. Mr. Todd, you said you looked at Patty's; is that right?

A. At one point in time, yes.

Q. In regard to these cases; is that right?

A. Probably in regard to these or Celanese, I'm not sure which.

Q. Well, I've got a 1982 volume of Patty's, which, in Volume 2C, Page 4304, discusses the carcinogenicity of vinyl chloride. Would you look at that paragraph for a second, sir?

Are you finished, sir?

A. Well, I was until I got distracted there.

Q. Take your time.

A. Okay.

Q. That makes reference to an IARC conclusion or study, doesn't it, sir?

A. That is correct.

Q. Now, Mr. Todd, I'm a little bit confused, because I asked you a question one time about whether or not you would be, in your mind, possibly testifying concerning the cause-and-effect relationship or association between vinyl

chloride and cancers in these gentlemen, and I believe you indicated that you may possibly do that, and then in another point in your testimony, I believe that you didn't understand that that was your charge.

A. Well, my understanding is there is a medical expert involved in the case, and that is basically their role or his role, as the case may be.

Q. And your role is to act as an industrial hygienist; is that right?

A. Industrial hygienist in a broad sense of the word, that is correct.

Q. Patty's, as you've already indicated, is an industrial hygiene manual; is that right?

A. It's an industrial hygiene textbook. I don't know if I'd use the word "manual."

Q. I'll accept that characterization. In this paragraph that I've shown you, doesn't this industrial hygiene textbook indicate that at least digestive system cancers, the data in the IARC publication indicates that the information is insufficient to evaluate the cancer-causing potential of polyvinyl chloride with relation to those cancers?

A. That's what it says in these chapters, that

is true in the current IARC. Also, I'm not sure who that author is. That individual is unknown to me. I don't know what her background and how she interpreted what she had.

Q. You haven't gone to the IARC article to look at that; is that correct?

A. No. It would be a very easy thing to do. I haven't because I wasn't asked to do that as part of my charge, at least initially. Whether that changes or not, it's not my decision.

Q. But you mentioned that you did look at Patty's when you began this work.

A. I did look at Patty's, and I believe you'll find mine is the same edition as that.

Q. And you saw that information in Patty's when you began working on this case; is that right?

A. I don't know if it was when I began or when I was working on some of the Celanese cases that we referred to earlier.

Q. But in any event, we're looking at the same volume; is that right?

A. I think you'll find it's the same volume, same edition. Whether mine came out in 1982 or not, I don't know, but I doubt that it's been updated since then.

MR. DELLI BOVI: Could we stipulate for the record that the section of Patty's that Mr. Todd was shown was the section on polyvinyl chloride and not the section on vinyl chloride?

MR. BUNDA: Well, I don't know, Kirk, if I can stipulate to that.

MR. MEYER: If you give it a volume and a page number --

MR. DELLI BOVI: Well, let's do that. Can we stipulate to the volume and page number that Mr. Todd was referred to?

MR. BUNDA: I think I've indicated that on the record.

THE WITNESS: I think you already did.

MR. DELLI BOVI: The only reason I brought it up is because I looked in the index, and there's a section on vinyl chloride carcinogenicity that's in a volume different than that one.

(Whereupon, a discussion was held off the record.)

BY MR. BUNDA:

Q. Mr. Todd, getting back to one of the comments that you made earlier that the dust exposure to polyvinyl chloride dust would have some effect on the amount of vinyl chloride monomer that someone would or might be subject to, and to that extent, the polyvinyl chloride exposure would have importance to you, do you remember that testimony?

A. Yes. I said in essence that the dust would add to what was available in the vapor form for direct inhalation.

Q. That would depend upon -- when you say "vapor," you're talking about vinyl chloride monomer; is that right?

A. I'm talking about vinyl chloride monomer in the vapor state, which may volatize off the PVC either in the bags or elsewhere.

Q. Well, you anticipate my next question. Simply knowing the existence of polyvinyl chloride dust will not tell you how much vinyl chloride monomer the person would be subject to.

A. Absolutely correct.

Q. You'd have to know how much vinyl chloride monomer was left in the dust; is that right?

A. Well, that would certainly be helpful. That

would certainly be helpful, surely. If you knew what the dust exposure was and you knew what the residual monomer was, you could then add that component to anything that was a result of direct vapor exposure.

Q. If you don't how much monomer is in the dust, you don't know how much exposure there was to the vinyl chloride monomer; is that right?

A. Yeah, in a simplistic sense, that's correct.

Q. I don't want to be simplistic. Explain to me what you mean.

A. Well, your question really suggests do I know it quantitatively, and if you again go back to the time frame that we're talking about, we know all the PVC's contain residual monomer. Even today a good many of the PVC products, PVC formulations, contain measurable levels of the monomer.

Pre-1974, of course, they were astronomically higher. What you don't know is whether they contain 647 ppm or 1,210 or 2,001 or 135.

What you can say is if they contain the given quantity and they were inhaled as a dust, and that dust either entered the GI tract because it was large dust particles--and that's ultimately where they usually end up--

or it entered the lungs because it was very small particles, that that vinyl chloride which was in there because of either digestive tract activity or lung activity -- activity in the lungs, ultimately would result in off-gassing, and, therefore, direct systemic absorption of the material, adding to any vinyl chloride which is inhaled as the vapor itself.

Do you follow what I'm saying there?

Q I understand what you're saying. You've also indicated that vinyl chloride monomer is given off poly-vinyl chloride particles over time; is that right?

A Assuming it's there in a concentration, it's going to off-gas. How rapidly it off-gasses depends upon several factors, all of which were discussed in these articles and elsewhere.

Q It depends on the temperature --

A It depends the temperature, porosity.

Q Size of the particles?

A A whole number of factors.

Q Size of the particles?

A Size of the particles, among others.

Q It depends on -- in the mechanism that you're describing, it depends on the amount of exposure to

polyvinyl choride dust; is that right?

A. I'm sorry, I didn't understand the question.

Q. Well, you're describing a system where somebody breathes in the dust or swallows the dust and is exposed to vinyl chloride monomer.

A. Yes.

Q. And my question was addressed to the fact that he had to, in fact, be exposed to that dust; is that right?

A. Absolutely correct. It would have to be in something like bag transfer or in the operation where you can expect to find a measurable level of dust, either intermittently or continuously, depending on what the operation was like and how good the collection-ventilation system was and so forth and so on.

Q. You would also have to know, for example, the ventilation system in the plant?

A. At least on a qualitative fashion, that's correct, you'd have to have a basic understanding of what was in the plant as basic engineering controls as a function of time.

Q. And you'd have to know the size of the plant.

A. Well, size of the plant in general is useful, but it's not the most useful piece of information, because

you could have a tremendously large plant and only 10 percent of it involved in PVC, and if it was compartmentalized for 10 percent, then the other 90 percent is extraneous in terms of your evaluation, so overall size is intersting but not necessarily directly pertinent.

Q. You'd have to know the layout of the plant.

A. You'd have to know the layout of the plant; you'd have to know how much material that's used, to any extent you can, at least qualitatively estimate how much residual monomer is in there, and under what circumstances would off-gas; under what circumstances you could get dust exposure and so forth and so on as a function of how they handle it and how they try to control those airborne contaminants when they are handled.

Q. Can we go through the documents that you've brought with you?

A. Yes, I don't see any reason why we can't.

Q. What are the --

A. Mountain of documents? Well, they're a mixture of Plaintiff's exhibits, depositions, a sprinkling of scientific articles, answers to Interrogatories. I don't know how else I can depict them, some test data here and there.

Q. Well, let's look at this first file that you have here.

A. I think there's a more recent one on top there. I haven't had a chance to look at that one, by the way. That one literally didn't even arrive yet at my office. I picked that up here this morning. I haven't had a chance to look at that.

Q. You're referring to a cover letter from Murray & Murray dated April 22, 1988, transmitting a BFG Technical Document consisting of 18 pages; is that correct?

A. That's the one -- not the whole pile, just that article.

Q. What about the other things that are in this pile? Do you know what they are?

A. Well, without going through the pile myself, I couldn't -- I couldn't recite them. I think most of them are exhibits of various types from the firm. The labels could probably identify it far better than I could from here.

Q. I'm sorry, what was that last part?

A. I said the labels could probably identify them a lot better than I can do. I don't read upside down.

Q. Why don't you look at them right side up and explain to me what they are.

A. Somehow or another, this seems to lack an official exhibit number, but it says Exhibit 4, B.F. Goodrich Company Standard Test Procedure; G.C. procedure for -- I'm abbreviating them. We are notorious for abbreviating.

Q. I've noticed that you guys studiously avoid saying the full word, and I like to hear it, because I have a problem saying it, and I want you to say it.

A. It's a B.F. Goodrich Standard Test Procedure 937DC, and it appears to be for residual -- it's a G.C. procedure for residual vinyl chloride.

Q. Mr. Todd, you've got, as you've characterized, a mountain of stuff here. What I would like you to do is go through this first pile and indicate for me, as perhaps a time saving measure, those documents that you consider to be significant. If you consider them all significant, then we're going to have to take a different tactic.

A. Well, this is interesting because it -- again, it tells me how they will be measuring residuals. The second one is ambient vinyl chloride monitoring. Again, it's a -- I presume it's a Goodrich document since it's

in the same pile, and it's dated April of '75.

This is one of their warehouse facilities in March and April of '75 in which they show concentrations in ppm as well as, apparently, air concentrations.

Q. Does that have any significance to you, in your opinion?

A. Yes, it's useful data in that this tells you roughly a year, a few months later what air concentrations are like in the warehouse. Done by an organization who should have a pretty good capability to monitor them qualitatively, it's useful.

Q. The first document that you mentioned concerned the testing method that BFG used for --

A. Yeah, it's their method at that point in time for measuring residual monomer.

Q. Do you have any problems with the method that's set forth? Do you dispute the method that they used, again, the context of the time?

A. I would think probably of the companies who were in the business at that time, they would probably have been in the forefront of method development; therefore, I probably would give their methodology a lot more credit than some of the companies who were floundering in developing it

at the last minute, and I have no reason to believe in looking at their data and methodology that it's contrary to what was commonly used at that time, and, to some extent, is still used with specific modifications.

The next exhibit is some monitoring of the ambient level of vinyl chloride in April of '75 in a specific Goodrich plant, in this particular case, Avon Lake, Ohio. Again, it's useful background information, tells you what they were looking at in terms of airborne levels in a company which probably is more sophisticated than most here, plus after the temporary emergency standard when the permanent standard, of course, had already gone into effect.

Q. Does that have any relevance to you in determining what the exposure levels were at Chrysler?

A. Well, it would in this sense: Based on a description of events at Chrysler and their relative sophistication compared to Goodrich, you would expect that certainly their level at Chrysler, again, if they were both related to PVC, per se, would be no less, so it would represent a base line.

Q. Hold on. Let me understand that now.

A. Assuming they were both related to PVC, you would expect Goodrich to be more sophisticated in terms of

their control, based only on what we know about the Chrysler plant in general.

Q. You understand that Avon Lake was a PVC manufacturing facility?

A. I assume it was a PVC manufacturing facility, but I also assume there was parts of that facility where people were only exposed to PVC, not to vinyl chloride directly.

Q. And you're saying that you're equating the exposure levels in a PVC manufacturing facility--

A. No, not to parts of that manufacturing facility where they're working with PVC, with VC.

Q. You're equating parts of that facility to the exposures at a PVC fabricating facility.

A. When I say "equating," I'm using it as a base line.

Q. What do you mean by "base line?"

A. Well, if you had a warehousing facility at B.F. Goodrich, you certainly had far more time for alerting them as to the problem, you would expect them to be much more sophisticated in their control at some point in time after the incident for--than December of 1973, than you would the other uses, and by that, I mean the warehouse --

warehousing and similar type operations which would be more analogous to the Chrysler situation as they receive the material and just do straight processing.

Now, it has fitted into that equation without any heating procedure or processing factor. Obviously, they're not doing that at the facility, and that's why I said it would serve as a base line.

Q. I still don't understand what you mean by "base line."

A. It would tell you exposure at Chrysler shouldn't be any less than that minimally. They would be reflected in what you see at the warehouse and similar facilities in these type plants at that point in time. This is a year -- well, essentially 15 months or more after the incident.

Q. You're saying -- let me get you straight now. You're saying that the exposures at the Chrysler fabricating facility should be at least what they are in the Goodrich warehouse or perhaps higher?

A. That's right. I wouldn't expect what I know on the basis of Chrysler at that point in time for them to have installed nearly as good controls to -- they're not only working with PVC, but they're dissolving it and heating

it and so forth, and, therefore, you're going to enhance liberation of the vinyl chloride above and beyond the pure simple degassing as a function of time and ambient temperature.

Q. You will agree with me that PVC, over time, absent any fabricating or working of the material, nevertheless, as you characterize it, off-gasses, gives off vinyl chloride monomer; is that correct?

A. That's correct.

Q. Just sitting in the warehouse.

A. Assuming it's got a measurable level of vinyl chloride. If it didn't, you couldn't measure it, not meaning it's not there, but it's below your ability analytically to project it.

Q. Presume that it's in bags sitting in a Goodrich warehouse, it's giving off vinyl chloride monomer; is that correct?

A. That's correct.

Q. Over time, the level of vinyl chloride monomer goes down as it sits there; is that right?

A. That's correct, depending on a number of factors, but that's, in general, correct.

Q. Temperature?

A. Air return rate, porosity in the resin and a number of other factors.

Q. And the vinyl chloride monomer content goes --

A. That's correct.

Q. You have to know how long this bag was sitting in the Goodrich warehouse to know, for instance, how much vinyl chloride monomer is left at the time that it's shipped, right?

A. Well, the data isn't all that straightforward. The answer is yes and no. I suppose if you were talking about an exaggerated case where it sat around for a year, that would be a very important factor. If it sat around for a month or less, that may not be that large a factor, and, as a matter of fact, there's a little contingency which suggests that after a week -- and, as a matter of fact, analytically, in some cases they found more after a week than they did originally, which is a little bit amusing from an analytical standpoint, but barring it being a tremendously long time or very rapid degassing rate, time doesn't seem to be a big factor here simply because the material, generally speaking, was warehoused that long.

Q. What is the basis for that statement? How do you know that?

A. Well, a number of reasons for knowing it. One, I was somewhat involved in the vinyl chloride incident of early '74 to the basic starting material for vinyl chloride monomer, and, ultimately, PVC comes out of the oil industry, and with the Arab oil crunch of late '73, there was a scramble for supply of any petrochemical materials, including PVC. Consequently, it was a seller's market; consequently, warehouses did not remain full, and turnover was very rapid because of the demand versus the supply.

Now, that has varied from year to year, but by and large, most PVC manufacturers try not to build up tremendous stores simply because of the economics.

Q. Mr. Todd, I'm not sure you're addressing my question, so let me ask the question again.

A. Okay.

Q. From what I heard in your answer, what you're saying is that they didn't warehouse it, they shipped it as soon as they made it; is that what you said?

A. As soon as they had orders to fill, it went out because of the demand.

Q. I'm asking for the basis upon which you have just stated your opinion that sitting in the warehouse, the bags of PVC did not give off vinyl chloride monomer

over the span of, for example, a week, I believe?

A. No, I didn't say they didn't give it off. I said the amount they gave off wasn't that significant in terms of your potential health risk diminishing to any large magnitude.

Q. I'll accept your clarification, and I'll ask for the basis for that opinion. The first basis I believe you gave me was that you worked for the Society of Plastic Industries; is that right?

A. SPI, and one of the specific manufacturers of PVC, and at that point in time, as quickly as they could make it, it went out of their warehouse as soon as it feasibly could, depending on availability and so forth.

Q. Well, you're still missing the distinction that I'm trying to make. I'm saying as it sits in the warehouse, for example, a week --

A. Uh-huh.

Q. -- how do you know that the amount of off-gassing is not significant?

A. Well, there's a number of articles in there from people who have done playing with it. If you believe their data, and I have no reason not to believe it, since they make the material, and they were the ones doing the

testing, the indications are unless temperatures were extremely high and the resin was extremely poor, a week or two doesn't make a whole lot of difference.

Q. What articles are you referring to?

A. Well, I think you'll find there is a Conoco study, and if I'm not mistaken, I think there is also some data in there from, I believe, Union Carbide, and possibly B.F. Goodrich.

Q. Okay. I'm sorry, but I've got to ask you to find those articles.

A. I was afraid you were going to do that.

Q. Well, I have to get to the bottom of this.

A. Okay, here is one. It's B.F Goodrich Technical Document, and it's called "A Physical Model"-- I wish there was a number on this thing.

Q. Well, let's mark this as an exhibit--

A. It's apparently Exhibit 8 of B.F Goodrich, I assume that.

Q. Well, let's stop for a second, Mr. Todd.

Could we have that marked as Defendant's Exhibit 1 at the top of the deposition, please?

A. Now, that's one.

Q. You have got to stop a minute. She can't mark it while you talk.

(Whereupon, Defendant's Exhibits 1 and 2 were marked.)

BY MR. BUNDA:

Q. Mr. Todd, my understanding is that the basis for your earlier opinion that the level of vinyl chloride monomer does not off-gas to a significant extent during warehousing is contained in the documents that you have before you; is that right?

A. There is a number of documents there that report assays residual material as a function of storing and other processing.

Q. Now, sir, you've given me Defendant's Exhibit No. 1 and Defendant's Exhibit No. 2, which you believe is information which supports your opinion in that regard; is that fair?

A. Those are part of it. Those are the ones we were able to dig out.

Q. Well, sir, what I am going to do is go on perhaps to another area, and perhaps ask you at the lunch break if you could go through the rest of the information and supply that that addresses this particular concern.

A. Okay, I can try on a lunch break. Again, like everybody else, I don't want to starve to death.

Q. I want to be fair to you, too. All I'm suggesting is perhaps you may need additional time, and I'm trying to give that to you.

A. Well, we'll see if we can supplement that with other documents.

Q. Sir, if I can maybe explore around the subject a little bit without getting into great depth on this particular opinion of yours, you stated that the level of the vinyl chloride monomer gas does not degrade significantly as they relate to -- how did you put it -- the biological exposures? Somehow you related that to the significant exposures, and what I'm looking to do is get some sense from you as to what type of exposures are we talking about as to while it's warehousing and while it came into the Chrysler plant.

A. Can you restate that and make that more specific? You've kind of wandered there a bit, and I know it wasn't intentional, but it was a series of questions all stuck together.

Q. Maybe I can kill that question and we'll try again.

You talked about a base line; is that right?

A. Okay. We were talking about the B.F. Goodrich

study in '75, spring of '75, as being a base line of where the industry in general was in the handling of PVC and air concentrations related to it.

Q. I believe that you referred to the vinyl chloride monomer levels from the warehouse as being a type of base line; is that right?

A. That would be a good comparitive -- a good comparitive base line for the Chrysler operation.

Q. A comparitive base line as to the exposures at Chrysler, right?

A. Yeah, they should give you an index of minimal concentrations should be expected there simply because you would anticipate that B.F. Goodrich technology would be more sophisticated in that area, in addition to which a number of the modifications which occurred in the critical areas of Chrysler actually weren't on their way until late '74 or early '75. I'm speaking of ventilation now.

Q. And when you say "a base line," what you mean by that is that the exposures were at least that at the Chrysler plant and perhaps higher?

A. That's correct.

Q. When we are talking in the area of 1973 and '74, what kind of exposures are we talking about, how many

parts per million?

A. Are you talking about air concentration?

Q. Yes, sir.

A. Well, if you believe the numbers which are quoted by Wheeler and a number of other authors as to the residual vinyl chloride levels in the pre-early '74 era where they quote concentrations ranging from 500 to 2,000 parts per million of residual monomer in the material manufactured, and they don't seem to tell you whether that's as it's delivered or whether it's as it's manufactured, although, again, you get the impression that it doesn't sit around very long, anyway, so maybe it's an academic point.

If you again go back to,one, some experience I've had in that particular area: two, the B.F. Goodrich model system of projecting exposures, and this is in general sort of what you get from off-gassing as a function of what the residual monomer -- pardon me, levels are, somewhere in this pile of information--again, I'm sure we can dig it out--they have developed a mathmatical model based on their field experience.

I think this goes back to the mid '70's era, '75 or that time frame, as I recall, perhaps a little later,

where they project the amount of monomer residual as a function of what you would expect to see airborne, and if I understand their model correctly, they're saying with reasonable statistical certainty you can project that 20 ppm residual monomer, 20, 25, on that order of magnitude, should, in most instances, give you 1 ppm or thereabouts of actual airborne material--or maybe I should say less than 1 ppm with statistical confidence most of the time, and, again, there is a scattering type of effect.

If that's true, and let's just assume it's 20 for simplicity, then 500 ppm residual monomer would give you a 20 ppm exposure, or a thousand would give you 40 or 2,000 would give you 80, okay. Unfortunately, neither Goodrich nor anybody else pre 1974 was doing any monitoring so that they could say with certainty when the levels were this high, these are actual air concentrations that we encounter. Their model is based on field data and mathmatical calculations, the best data available.

Now, interestingly enough, in early '74 in the warehouse facility that we went into, 25 to 50 was typically kind of what we ran into. Now, these are PVC manufacturing plants. Now, admittedly, the material went in and came out as quickly as it could, and admittedly, they're typical

high ceiling with limited ventilation, but a lot of natural ventilation because the open doors and trucks going in and out and so on, so there's seemingly general agreement there.

Q. General agreement about what?

A. In terms in the order of magnitude of exposure that you can expect, at least in early '74 and periods immediately preceding. What it was like in the '60's and the '50's, don't know.

Q. Well, we're not concerned with --

A. Again, it certainly wasn't any better.

Q. Well, we're not concerned with the '50's here --

A. Well, we're concerned with the late '60's. Whether this was much worse in the late '60's or not, you don't know. At least from Chrysler's standpoint, it would appear as though what they had installed in the early '70's in terms of dilution and related ventilation was basically what they should have had in the late '60's; therefore, you would expect similar type exposures, all other considerations being identical.

Q. I didn't understand that last phrase or that last part. Can you run that by me again?

A. Maybe she can better than I.

Q. No, I can read it when I get the transcript.

A. What I said was, as I understand the Chrysler plant from an engineering and process standpoint, their purchase of that from, I believe, air -- call it '68, from the information I received leads me to believe that relatively little, if any, engineering modifications occurred until early '74. If that's true, then what one could depict for early '74, could probably apply that to '68 without multiplying it by any factors.

Q. The levels of exposures encountered in '74 can be extrapolated as being consistent?

A. Yeah, I think that's valid. I don't think they were any worse in '68. I don't think they are any better, but I don't see indications in the Chrysler plant of -- they bought it in '68, and, you know, the ventilation consisted of a guy with a little pair of bellows at one of the windows. It would appear that the dilution and other ventilation was in the plant when they purchased it, and just didn't get upgraded until '74 when the vinyl chloride situation broke loose, at which time they promptly began to upgrade and go to more elaborate local exhaust as well as producing greater amounts of dilution air feeding into the system, so it wasn't extremely --

Q. Let me understand your testimony correctly.

You were saying that Chrysler changed ventilation in the plant because of the vinyl chloride situation?

A. Well, that's what would appear if you believe their responses, yes, they upgraded their ventilation system in response to vinyl chloride, and again, later, I think in '76, in response to problems with solvent exposures, but, yes, there is at least two or maybe three upgradings, one in terms of supply air and two in terms of exhaust.

Q. All right. Can you get that information out for me, then? I want to see what you're referring to.

A. These would be responses to Chrysler Interrogatories. I'll just have to dig.

(Whereupon, a discussion was held off the record.)

A. This is a description of the ventilation equipment in the ink mixing and related areas, I guess. This is basically in response to the Interrogatories in which they described ventilation installed, in this particular case, the wall exhaust fans that go back to some-time in mid '60's, and they were installed by Airco out in the Ink Room; a centrifugal roof mount exhaust fan was installed in 1970; a low-level, floor-type exhaust and

dilution ventilation in 1970. Again, here's in another room, a system which goes back to the Airco days, a dilution ventilation. These are all mid to late '60's, all Airco, individual fan units. No specifications provided.

Then -- oops, I got beyond myself. Suddenly in '76 -- I don't know whether these are subsequently.

Q. If I can interrupt you there for just a second, Mr. Todd, I'm asking you for the information that you're relying on in your opinion that the ventilation was changed in 1974 because of vinyl chloride.

A. Okay.

Q. Where does it say that in there?

A. Nothing had occurred, apparently, from '68 to '70, and then '70 they added a little dilution ventilation. In June of '74, they added a new air supply -- make up air, okay. Don't have the specifications on it, but they at least described who made it and so forth in this, including their steam coils for heating and so forth, and there's another new air make up unit.

Hold on a second. There's a third make up air unit. Hold on a second. Yeah, this, I'm sorry, is not make up. This is an exhaust, again, June of '74. Here's another exhaust. Here is a third exhaust fan put in in

June of '74.

Here is a fourth one. This is, again, tempered air make up from June of '74; another tempered air make up, June of '74. Here is one there's no date, it's again air make up; and then it was in '76, which were in response to that solvent thing. They're not in sequence, but there's a number of air make up and exhausts that were put in in June of '74.

Based on the time frame, you would expect that they are in response to the VC monomer problems simply because your time required for ordering equipment is minimally a few months, and more realistically several, and that would fit into the time frame. There's no other indication of any specific problem there that they were addressing --

Q. And there is no --

A. -- other than that.

Q. Okay. Are you finished?

A. Yes.

Q. I don't mean to interrupt you. That's why I wanted to ask.

A. That's all right.

Q. There is no specification in the documents

that you've seen that those air changes, those ventilation changes in 1974 were because of vinyl chloride; is that correct?

A. Not specifically in response to the Interrogatory. They talk about improving the -- both the exhaust and the air make up to the specific equipment and area, but they don't say this was done for a specific material.

Q. Your information that the time period during which this change was done gives reason to believe that it was done because of vinyl chloride; is that fair?

A. That, plus my discussions with the people at the Chrysler plant would suggest that's a correct assumption. Okay. They had no other reason, if I can believe these statements in a straightforward fashion, for upgrading the ventilation in that area.

Q. What did the people tell you at the plant on this point?

A. That the systems were modified to make them much more effective in collecting air contaminants with specific concern oriented to possible vinyl chloride because of that standard, that proposed standard at that point in time of somewhere between 125 ppm -- or maybe I should say

no detectible and 25 ppm.

Q. Who told you that?

A. I don't know whether I can tell you who specifically told me in the discussions I had with them or not,whether it was some of their supervisory people or Mr. Ferguson. I know Ferguson mentioned upgrading that ventilation specifically in the mid '70's.

Q. Did he say why?

A. I don't recall whether it was him or somebody else who indicated the upgrading was done in response to concern for vinyl chloride exposures because of the fact that they were informed there was potential for VC exposure.

Q. You don't remember who told you that out at Chrysler; is that right?

A. Specifically at this point, no, I don't.

Q. Was it more than one person?

A. It might have been. Again, I've spoken to four or five, maybe six people out there.

Q. As you sit here today, do you have a recollection as to whether it was more than one person?

A. Specifically, no, I don't.

Q. Do you recall what he looked like?

A. As I said, it may have been Ferguson. It may

have been some of the others. Again, when you're out there with a group of individuals and you're asking questions as you go along, you often don't pay attention to who is giving you a specific response.

Q. When is it, do you recall, that they changed the ventilation for the solvent exposures, or as a result of the --

A. Did I give you a listing -- that listing, or is that still here?

Q. Here?

A. I think it's in '76, but I'm not sure when in '76 it indicates it.

Where is that response list?

MR. DELLI BOVI: Here.

THE WITNESS: Oh, is it here? I'm sorry, where is the response to the Interrogatories.

MR. DELLI BOVI: Right there.

THE WITNESS: No, that's Conoco.

(Whereupon, a discussion was held off the record.)

A. No, it was 1976. The question is when. Here

it is, March 1976, they put in a local exhaust system for their batch mixers for solvent fumes. There's two systems in March of '76-- three systems in March of '76. Apparently they also put a system in in March of 1976. This is for dust and fumes from the blender during loading and so forth. Those are the only four systems for 1976 assuming they're out of order. They only have that one system I referred to earlier with no specific date on it, so there's at least four systems in '76, apparently early '76.

If my memory serves me correctly, I believe they were cited a month or two prior to that by OSHA for overexposure to solvents.

MR. MEYER: Those are Chrysler's Interrogatory responses?

THE WITNESS: Those are Chrysler responses.

BY MR. BUNDA:

Q. You've seen the State of Ohio information and the Chrysler information regarding exposure levels for vinyl chloride which were done in the beginning of 1974; is that right?

A. I saw the Chrysler data. I don't recall seeing any from the State of Ohio. I'm not going to say that's

incorrect, but as I recall, the State of Ohio was into the plant several times, and I thought most of that work they did was predating 1974 and wasn't related at all to vinyl chloride, and I'm saying that from recollection. I know Chrysler did monitoring sometime in the '74-on time frame, but not before that.

Q. Well, thrusting aside the issue of who did that monitoring, you've seen those results; is that right?

A. I have seen the data, yeah. There's a little data here and a little data there.

Q. Do you accept that data as being valid?

A. I would accept the samples that were taken as being valid. Whether they represent a full spectrum of all the potential exposures is not a question.

I haven't seen anything from the Ink Room, for example, indicating what sort of exposures occurred in there. Why that's not included, I don't know, but I would assume Chrysler was sophisticated enough to do it correctly, and that the people who did the analysis did it correctly, and, therefore, those numbers that they generated are valid.

Whether they represent all the potential exposures at this point in time is another matter.

Q. Regarding that other matter, there were some

exposures taken in the Ink Room, do you recall that?

A. For vinyl chloride?

Q. Yes.

A. Yes, I believe that is correct, not necessarily the areas where you'd expect the greatest potential exposures, but I agree you're correct that there was some taken somewhere in the Ink Room, and I've forgotten the time frame without looking at the data.

Q. And there were exposures taken of Mr. Wallace, do you recall that?

A. I believe that's correct, there was of Wallace, and I'm saying that again from recollection without having seen the data for quite some time.

Q. And those exposures in the Ink Room and Mr. Wallace were both below the .5 parts per million; is that correct?

A. I believe that is correct, and again, I'd have to look at the hard data.

Q. Would you agree with me that again the actual exposure levels,you would not need to do this extrapolation that you were talking about from the B. F. Goodrich exposure?

A. Well, that isn't necessarily true. It depends on what he was doing on the given day he was monitored and

whether that reflects what he did over his entire course of history. It also is somewhat dependent upon what sort of stream they were feeding to the Ink Room on that particular day, i.e., and, of course, more importantly, where was he in relationship to where the potential maximum exposures were on this particular day; you know, was he in a task mode where he went in and out very intermittently, where as another day he might have spent an entire day, either because of his job classification or because of specific job problems which required him to be there, and now does this data tell you about the best case, the worst case, or somewhere in between.

Q. What can you tell me about that?

A. Not a whole lot. It says here the number, and I monitored the guy.

Q. Do you have any way of supplying that information, the information that you're talking about?

A. Unless you could go back to their files and find out particularly what his job classification was on that particular day or days, how much time he actually spent in the area of concern, then you might be able to use it.

Now, whether Chrysler would be willing or