

1 CONSOLIDATED
2 CAUSE NO. A-135,876
3 KEITH F. GIBLIN, ET AL * IN THE DISTRICT COURT OF
VS. * JEFFERSON COUNTY, TEXAS
4 A.C.& S., INC., ET AL * 58TH JUDICIAL DISTRICT
5 CAUSE NO. A-140,498
6 JOYCE A. BORNE, ET AL * IN THE DISTRICT COURT OF
VS. * JEFFERSON COUNTY, TEXAS
7 ALLIED SIGNAL, INC., ET AL * 58TH JUDICIAL DISTRICT
8 CAUSE NO. E-141,216
9 JOSEPH E. BARNARD, ET UX * IN THE DISTRICT COURT OF
VS. * JEFFERSON COUNTY, TEXAS
10 ALLIED-SIGNAL, INC., ET AL * 58TH JUDICIAL DISTRICT
11 CAUSE NO. B-141,242
12 ROOSEVELT SCOTT * IN THE DISTRICT COURT OF
VS. * JEFFERSON COUNTY, TEXAS
13 AMERICAN OPTICAL CORPORATION, *
ET AL * 60TH JUDICIAL DISTRICT
14 CONSOLIDATED
15 CAUSE NO. A-134,614
16 FRENCH HICKS, ET AL * IN THE DISTRICT COURT OF
VS. * JEFFERSON COUNTY, TEXAS
17 BETHLEHEM STEEL CORP., ET AL * 58TH JUDICIAL DISTRICT
18 CAUSE NO. B-126,986
19 RUSSELL ALLEN, ET AL * IN THE DISTRICT COURT OF
VS. * JEFFERSON COUNTY, TEXAS
20 AMERICAN PETROFINA, INC., ET AL * 60TH JUDICIAL DISTRICT
21 CONSOLIDATED
22 CAUSE NO. A-144,426
23 GLADYS FORRESTIER, ET AL * IN THE DISTRICT COURT OF
VS. * JEFFERSON COUNTY, TEXAS
24 AC&S, INC., ET AL * 58TH JUDICIAL DISTRICT
25

VIDEOTAPED DEPOSITION OF JACK E. PETERSON, P.E., Ph.D.

VOLUME II

Taken on the 27th day of September, 1996, beginning at
9:32 a.m. at the US Grant Hotel; San Diego, California,
before Laura Dee Bates, a Certified Shorthand Reporter and
Notary Public in and for the State of Texas, Pursuant to the
attached Notice.

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1 THE REPORTER: Pursuant to the Rules?

2 MR. BEASON: Can we have the agreement that one

3 objection is good for all?

4 MR. BLANKS: We can indeed have that agreement.

5 MR. BEASON: Thank you, Joe.

6 MR. BLANKS: Any other stipulations we need?

7 JACK E. PETERSON, P.E., Ph.D.,

8 was called as a witness by the Plaintiff and, after having

9 been duly sworn, testified as follows:

10 EXAMINATION

11 BY MR. BLANKS:

12 Q Good morning, Dr. Peterson.

13 A Good morning, Mr. Blanks.

14 Q It's a pleasure to see you again, sir.

15 A The pleasure is mine, as well.

16 Q I know we covered a lot of things when we began this
17 deposition back on March the 26th of 1993, and you would
18 have thought we could have finished then. I'm going to try
19 not to repeat all those things but I guess of necessity
20 we'll stumble back into some of them and with apologies but
21 we'll just kind of get on through it as promptly as we can.

22 You by now must have seen a copy of that transcript
23 from March of 1993?

24 A I have.

25 Q Have you had a chance to just read through it and see

1 what we talked about, refresh your memory?

2 A Yes.

3 Q If I were to ask you those same questions that I asked
4 back then, would you give, essentially, the same answers?

5 A Essentially, with one exception.

6 Q I knew it.

7 A Well, the exception is that I have seen an awful lot
8 more documents and stuff between now and then than I saw
9 then.

10 Q All right.

11 A So, other than that, my answers would be the same.

12 Q I mean, do you adopt this testimony from the March
13 26th, 1993, deposition beginning as your testimony today?

14 A Yes.

15 Q Very good, sir.

16 MR. JONES: Joe, for clarification, would that
17 include any errata sheets he might have supplied to that
18 deposition? I don't know whether he did or didn't.

19 A I don't know whether I did or didn't, either. I just
20 don't remember.

21 Q (By Mr. Blanks) The truth is, I don't either.

22 A The copy that I saw recently had some errors in it.
23 Whether those errors were ever corrected on a master, I
24 don't have any idea.

25 Q Okay.

1 MR. ALMQUIST: I think that it may have been the
2 case, because the deposition was not concluded, that we
3 haven't had him go through for the errata sheet at that
4 point.

5 MR. BLANKS: That -- that could well be. So, I
6 guess that remains to be done.

7 Q (By Mr. Blanks) We had your CV attached as an exhibit
8 to that deposition and we don't need to go back through that
9 but I have had a chance at least to go through it myself and
10 we'll have a few questions about that along the way. And I
11 I'm suggesting at this point that to the extent that we are
12 taking any new deposition or beginning any new deposition
13 today or that is in cases other than those that you were
14 noticed in or appeared in back on March 26th of 1993 that I
15 want to attach your CV, which was our Exhibit No. 280207
16 capital PET capital JAC capital E as an exhibit to any other

17 transcript, including the one that Mrs. Bates is going to
18 prepare.

19 And looking at the document that has been so labeled,
20 would you identify that for us, sir?

21 A Yes. That is my CV dated November 9, 1992.

22 Q No doubt you have been busy since then, but is there
23 anything that you would want to add to that by way of
24 publications or anything else worthy to note?

25 A Yeah. There have been three more publications; and my

1 activities, professional activities and the organizations
2 have changed since then.

3 MR. ALMQUIST: And, Joe, if you want to just
4 attach this, here is an updated copy as of September 10th.

5 MR. BLANKS: Oh, well, splendid. Okay. Well,
6 then, we'll make this an exhibit to the deposition with the
7 same number followed by a 1 after the E, your middle
8 initial.

9 (Marked Exhibit No. 280207PetJacE1 and is attached
10 hereto.)

11 Q (By Mr. Blanks) So, this will list the new
12 publications?

13 A Yes.

14 Q Anything interesting here?

15 A Well, all my publications are interesting.

16 Q I walked right into that one. We would be talking
17 about the ones that are numbered 53 through 55 are the new
18 ones?

19 A No. There is another one or two new ones that got

20 pushed back because these publications are listed
21 chronologically; and I found a couple of others where I had
22 been listed as an author on NIOSH publications, as I recall,
23 and stuck them in. So, they pushed everything down. The
24 only new one, really, is -- well, let's see. 52 was --
25 yeah. Well, anything dated from 1993, the last two here in

1 '94 and '95, are new.

2 Q Very good. Okay. And then, you say another one from
3 the past has been inserted in here somewhere, perhaps?

4 A Yes. Somewhere. I don't even know where.

5 Q Have you ever encountered instances of industrial
6 hygienists using ghost writers to write articles or to
7 coauthor articles with them?

8 A No.

9 Q I've been reading about this in the newspaper lately
10 about some drug companies. I just thought I would ask.

11 A No. I have never seen it. What has happened, what
12 does happen is that there will be a senior author and
13 several junior authors on a publication; and when I was
14 working at the medical college of Wisconsin, my boss, Dick
15 Stewart, wrote several publications where he listed people
16 in the lab almost at random and I got stuck in there as an
17 author because I had contributed to the work but I had no
18 contribution to the publication at all. And that's one of
19 those that I found and stuck back in there somewhere.

20 Q Okay. Well, I remember William Bradley told us once he
21 listed some, I want to say it was, like a maintenance man at
22 the building he was working at as an author on a publication

23 they did; but I hope I am not misquoting him now.

24 Have you been active in litigation work since we met in
25 1993?

1

1 A Yes.

2 Q Roughly, how many times have you gone and given
3 testimony since then?

4 A Roughly, two or three times a month.

5 Q And would this have been mostly for Owens-Corning
6 Fiberglass?

7 A Mostly, yes, but there have been others, of course.

8 Q What other kind of areas have you been testifying in?

9 A Oh, my. Probably next to the asbestos arena for
10 Owens-Corning and Rapid American and other companies here
11 and there, I've been testifying for the welding rod
12 manufacturing defendants mainly in cases where the complaint
13 is manganism.

14 I've also testified for a couple of plaintiffs in
15 asphyxiation cases.

16 What else have I done? No. I don't remember.

17 Q All right, sir. We talked at some length last time
18 about, generally, the nature of the testimony that you give
19 when Owens-Corning Fiberglass engages you. Has the content
20 of your testimony for OCF changed in any significant way
21 from what you told me about before?

22 A I don't believe so.

23 Q Okay.

24 A Virtually every time I testify, I say about the same
25 thing; but some attorneys want to emphasize some areas of my

1 testimony more than others. So, it does vary from case to
2 case; but I talk about industrial hygiene.

3 Q Okay. I'm thinking that you have been listed as an
4 expert in at least one of these cases that you are here in
5 today that's still an active case against OCF. Is -- what's
6 going to be the essence of the opinion you give, if you are
7 asked; or have you even been asked to give one in
8 connection, let's say, with the Hicks case?

9 A I know nothing about the Hicks case.

10 Q Okay. Do you know whether you are going to be used as
11 an expert or called to a trial or not?

12 A No, I do not know.

13 Q All right. But if the past performance is any
14 indication, your testimony will be along the lines of about
15 the same specific areas as its been in the past for OCF?

16 A So far as I'm concerned, it will be, yes.

17 Q All right, sir. Have you been teaching any courses
18 since we visited before?

19 A No. No. I have not done any teaching at all.

20 Q Was there a time during your teaching years that you
21 taught industrial hygiene courses?

22 A Oh, yes.

23 Q Was that the topic?

24 A I taught, basically, industrial hygiene and air
25 pollution courses. In addition, toward the end of my

1 teaching career, when I was teaching at the University of
2 Wisconsin Parkside campus, I taught toxicology;
3 pathophysiology; a course called "The Body in Question,"
4 which was designed to try and interest students in science,
5 industrial hygiene, and air pollution laboratories. I think
6 that's about it.

7 Q Were your industrial hygiene courses just general,
8 survey-type courses; or did they deal with specific areas?

9 A Yes.

10 Q Yes and yes. Okay. I mean, so you --

11 A Yeah. Generally, a survey -- if you read my book,
12 that's what I use as a text for my industrial hygiene
13 course; and that book arose from an outline that I would
14 pass out to students for my industrial hygiene course.

15 Q You probably made the students buy the book, too?

16 A No. I didn't make them do anything. The book was
17 available if they wanted to buy it.

18 Q Oh, okay. Well, did you teach any specially --
19 specialized industrial hygiene courses --

20 A Oh.

21 Q -- focusing on anything like, maybe, ventilation or,
22 you know, some narrow niche?

23 A No.

24 Q Okay. We didn't get a chance to talk much about the
25 folks that you had worked with along the way. I mean, you

1

1 mentioned some gentlemen from Dow, as I recall. You, no
2 doubt, met a lot of people going to the AIHA annual meetings

3 and section meetings and so forth, would I be right?
4 A You would be right.
5 Q And I think you said you started in the AIHA around
6 '56?
7 A Yes. The -- one of the requirements for membership is
8 that one work as an industrial hygienist for three years,
9 and I had started in industrial hygiene in '53. So that I
10 joined AIHA in '56, as soon as I was eligible.
11 Q Before actually joining, had you attended any AIHA
12 meetings?
13 A Only local section meetings.
14 Q Was there a local section?
15 A There was a Michigan section that met in the Detroit
16 area that those of us in the industrial hygiene group
17 attended now and then. We didn't attend all their meetings.
18 Q Was Mr. Patty a member there?
19 A I don't think I ever met Frank Patty. I don't recall
20 meeting him, if I did.
21 Q Did you ever meet William Bradley?
22 A Oh, yes.
23 Q What -- where did you run into him? At the AIHA
24 activities?
25 A Yeah. At one of the national meetings. I have seen

1

1 him since, of course.
2 Q Do you remember, I bet you do, the first three or four
3 annual meetings you went to, where they were?
4 A I remember the first one in '56 was in Philadelphia. I
5 don't remember the next couple because I didn't go every

6 year. I just went periodically. There were several in our
7 group, and all of us couldn't go to any one meeting.
8 Q You mean, they just wouldn't pay for you to go, huh?
9 A That's correct.
10 Q You did get to go to the one in Philadelphia in '56,
11 you recollect?
12 A Yes.
13 Q And then, did you later set up a local section in the
14 Midland area?
15 A We did.
16 Q You were instrumental in that?
17 A I was one of those who was.
18 Q Roughly, when was that, sir?
19 A Oh, my. Let's see. It would have been the late '50s
20 or early '60s, but I can't pinpoint it anymore than that.
21 Q It probably doesn't matter anymore than that. Did you
22 ever meet Phil Drinker in your professional activities?
23 A No.
24 Q How about Tony Lanza, the physician from Metropolitan?
25 A No. I know who he is, but I've never met him.

1

1 Q Did you become acquainted with Jim Hammond from Exxon
2 and Standard?
3 A I have known Jim for many years. Where I met him, I
4 don't recall.
5 Q Did you ever go to any of the, oh, Industrial Health
6 Conferences that were put on down in the Houston area by the
7 Houston Chamber of Commerce and the Gulf Coast section?
8 A No.

9 Q Okay. And you told me you recall having no involvement
10 with the API at any time?

11 A That's correct.

12 Q Do you know if Dow had any membership or participation
13 in API activities?

14 A No, I don't know.

15 Q Okay. You had talked about going to free -- I mean, to
16 Texas to Dow plants and that you had been down there a
17 couple of times to Freeport. Am I right?

18 A You are right.

19 Q Do you remember now what the purpose of your visits
20 were?

21 A One was to help solve a customer's problem in extruding
22 polyethylene, but I don't recall what I was doing at the Dow
23 plant for Dow.

24 Q Did -- would -- would you recall enough to say that you
25 didn't go down there specifically to do a plant survey or

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1 monitoring?

2 A I can tell you that I'm sure that I did a walk through
3 the plant. I don't recall taking any air samples or
4 measuring noise or anything on that order. Although, I may
5 have done so. I just simply do not recall.

6 Q Can you place these visits in time?

7 A No.

8 Q It's a good thing we moved over.

9 A It is getting noisy.

10 Q I think you told me that the Texas Dow plant did not
11 have an in-plant industrial hygienist when you -- on the

12 times you went down there?

13 A That is correct. They had a physician, but they didn't
14 have an industrial hygienist.

15 Q Do you recall the name of the physician?

16 A Jack Killian, K-i-l-l-i-a-n, I believe.

17 Q Do you know if that gentleman would still be living?

18 A I don't know.

19 Q And when you went to Freeport, were you traveling
20 alone; or were you accompanied by someone else from the
21 biochemical research department?

22 A I think I was the only one from the biochemical
23 research lab who went when I went. I flew back once on a
24 company plane with a number of Dow people, but none of them
25 was from the Dow chem lab.

1

1 Q Along the way in your professional activities, did you
2 ever run into Wilhelm Hueper?

3 A I know of him, but I've never met him.

4 Q How about Dr. Smith or Smithe from the Pittsburgh area,
5 Mellon Institute?

6 A Yes. I met Henry and knew him as an acquaintance that
7 I ran into at the meetings.

8 Q I think you have told me you don't remember ever going
9 to an Industrial Hygiene Foundation meeting.

10 A I don't know whether I told you or not, but I never
11 did.

12 Q Well, tell me again. But you do remember receiving the
13 "Industrial Hygiene Digest" at Dow?

14 A Dow received it. I didn't. It was in the biochemical

15 research laboratory library.

16 Q Well, let's -- let's talk about the library just a
17 little bit. Dow had more than one library there at the
18 Midland facility, didn't it?

19 A There was a central library to which everyone had
20 access; and then, each small group had its own library, so
21 far as I'm aware. The biochem lab most certainly had its
22 own library, which was quite small.

23 Q Quite small but quite extensive at the same time,
24 wasn't it?

25 A Well, extensive in that it had a couple of the

1

1 abstracting services volumes there, chemical abstracts or
2 biological abstracts. I've forgotten which.

3 Q Yes, sir.

4 A It had the "Index Medicus" and then a whole slough of
5 magazines and books and so forth.

6 Q And a very good collection of the journals that would
7 be of interest to an occupational physician and an
8 industrial hygienist and a toxicologist, correct?

9 A No, not in the library necessarily. The only journal I
10 recall in the library was the journal of the American
11 Medical Association. Those of us who were interested in,
12 for instance, industrial hygiene usually got that with our
13 membership in AIHA. We got the journal or the quarterly, it
14 started out being. And others subscribed to the AMA
15 "Archives of Environmental Health" or whatever it was
16 called at that time. In fact, that may have been in the Dow
17 biochem lab there.

18 Q And the "Journal of Industrial Hygiene and Toxicology"
19 was there, as well, wasn't it?

20 A Well, that sort of became another journal; and I don't
21 recall that we had any of the old issues there from the
22 "Journal of Industrial Hygiene and Toxicology." That
23 became the AMA "Archives of Environmental Health" or
24 whatever, I think.

25 Q Oh, okay. It started out being published at Harvard

1

1 under Dr. Drinker's guidance, right?

2 A Your memory is better than mine. I don't recall where
3 it started.

4 Q Okay. At any rate, in terms of technical reference
5 material and resources, you weren't lacking at the Dow plant
6 in those, were you?

7 A No.

8 Q If you needed it, you could either find it there
9 in-house or you had professionals who could find it
10 somewhere and get it for you?

11 A Yes. We, also, of course, had access to the central
12 Dow library where we could either get professional help, if
13 we needed it; or we could simply browse, if we wished.

14 Q Was that something that you would do from time to time?

15 A Oh, I think I was over there two or three times in the
16 13 years I was at Dow.

17 Q You only browsed two or three times, you say?

18 A I only ran across problems where I needed to get into
19 nonindustrial hygiene, nontoxicology literature a couple of
20 times that were over there.

21 Q Oh, you were only at the central library a couple of
22 times, you say?
23 A That's right.
24 Q Otherwise, the resources in the biomedical library were
25 adequate?

2

1 A Yes.
2 Q And I suppose if you needed an article that had been
3 published in a foreign language journal, those would have
4 been available to you for the asking?
5 A They would have been, yes. We had translation
6 facilities at Dow.
7 Q Indeed, the old "Industrial Hygiene Digest" even
8 abstracted foreign language journal articles, didn't it?
9 A Probably. I don't right offhand remember any of such,
10 but I don't know why they wouldn't. So, I suspect they did.
11 Q Okay. And the same would have been true in the
12 "Journal of Industrial Hygiene and Toxicology," correct?
13 A I don't understand what you mean by "the same."
14 Q That one could find in the "Journal of Industrial
15 Hygiene and Toxicology" abstracts of articles from
16 professional journals in Germany or France or Scandinavia?
17 A I don't remember.
18 Q Were these journals of the type we have been discussing
19 among the resources that you used in the early '50s and even
20 later to continue educating yourself and broadening your
21 training --
22 A Of course.
23 Q -- in industrial hygiene?

24 A Of course.

25 Q All right. Would I be right in thinking that you would

2

1 routinely review the journals as they came in both your AIHA
2 quarterly and perhaps one or more of these others that you
3 have mentioned?

4 A Yes. Not necessarily as they came in. I was pretty
5 busy, as we all were; but as time became available, a few
6 hours here and there, --

7 Q Yes, sir.

8 A -- I would review the journals, yes.

9 Q Okay. Did you -- did you ever get acquainted with
10 Kerry McCord?

11 A I met Kerry when I went back to school --

12 Q All right.

13 A -- at Ann Arbor in '65. He may have appeared at one of
14 the meetings of the local section, as well. I can still
15 remember what he looks like. I never had any real
16 conversation with him. I was part of a group that went past
17 his facilities.

18 Q What -- what was he doing when you met him in the mid
19 '60s?

20 A He was a professor emeritus, as I recall, and mainly
21 writing.

22 Q And he had been active in the industrial health field
23 in the Detroit area for many years, had he not?

24 A Decades, yes.

25 Q Okay. Do you recall what company he had worked with

1 along the way?

2 A No. No. I have no recollection of that at all.

3 Q Now, Mr. Patty was affiliated for many years with
4 General Motors Corporation, was he not?

5 A Yes. He was the head honcho industrial hygienist at GM
6 for many years.

7 Q Did Bill Bradley ever tell you how he and Frank Patty
8 had started out together?

9 A No. I never sat down to reminisce with Bill.

10 Q I'll tell you at the break. Did you ever come across a
11 Dr. William Fulton from the Pennsylvania Department of
12 Health?

13 A No.

14 Q Dow didn't have any plants in Pennsylvania, did it?

15 A Not that I'm aware of.

16 Q In your training, did you ever get a chance to go to
17 Harvard and take any short courses up there?

18 A No.

19 Q Were any of the gentlemen at Dow who you knew in the
20 industrial hygiene department trained at the Harvard Public
21 Health School?

22 A No, not that I'm aware of.

23 Q Am I right in thinking that most of these men had
24 engineering backgrounds like yourself?

25 A Yes. Well, while I was there, almost everybody had an

1 engineering background, except for Mr. Hoyle, who did not,
2 and Larry Silverstein had a background in radiation biology
3 or something on that order but most of the other people who
4 came through the lab or who subsequently got hired were
5 engineers.

6 Q Okay. Where did Mr. Silverstein go after Dow? Do you
7 know?

8 A To Dow subsidiaries of one kind or another. He went --
9 he eventually wound up at Dow Corning and retired from Dow
10 Corning, but he worked for another Dow something or another
11 in the meantime.

12 Q Do you know if he is still living?

13 A The last I knew, he was, yes.

14 Q We asked about Phil Drinker, and I wonder in that
15 connection if you ever meet Ted Hatch?

16 A Yes. I did meet Ted Hatch.

17 Q Just kind of in passing or --

18 A No. This was in probably '63 or '64 when I was
19 seriously considering going back to school. So, I found Ted
20 Hatch at one of the meetings and talked with him about going
21 to Pittsburgh. I also found Russell Silverman; and I talked
22 to him, as well. I eventually, of course, went with Warren
23 Cooke at the University of Michigan.

24 Q So, you were in Mr. Cooke's program?

25 A Yes.

1 Q Okay. And can you tell us anything about Warren
2 Cooke's background?

3 A Warren worked for an insurance company of some kind or

4 another for many years. He was one of those people who
5 evaluated the exposures of radium dial painters; but whether
6 he did that for the insurance company or for the Public
7 Health Service, I don't remember. But Warren was rather
8 proud of the fact that everybody thought that these gals
9 were getting their major exposure because they pointed the
10 brushes with their lips they used to paint the radium dials;
11 and he and the crew that he was working with showed that it
12 was inhalation of radon that overexposed them, not the oral
13 ingestion.

14 Q Really?

15 A Yes.

16 Q Did you use Drinker's and Hatch's textbook or technical
17 book in your work at Dow?

18 A We had it available. Whether I actually used it or
19 not, I don't recall. I recall reading it, but I don't
20 remember that I had other access to it subsequent to that.

21 Q Okay. Is it -- was it from that book, at least in
22 part, that you learned principles of air monitoring and
23 sampling and such as that?

24 A No. I was taught how to do air monitoring and sampling
25 by Mr. Hoyle and Mr. Schneider; and I occasionally, of

2

1 course, would check up on a new method or something on this
2 order. But most of what I learned about how to do this kind
3 of thing I learned from Hoyle and Schneider.

4 Q I noticed on your -- on your resume that most of the
5 articles you wrote in the years you worked at Dow and
6 sometime after that focused on vapors and gases; is that

7 fair?

8 A Yes, it is fair.

9 Q And I inferred from that that most of the work you did
10 at Dow that involved sampling and monitoring was in that
11 same area?

12 A That is correct.

13 Q In the early '50s, could you tell me what kind of
14 devices you used at Dow for sampling for vapors and gases?

15 A One of the techniques that I did quite a bit of
16 research on was the use of silica gel as an adsorbent for
17 vapors, and all of us used that technique quite a bit.

18 We also used a combustion technique that we had fitted
19 out into a -- well, it wasn't a portable. It was a mobile
20 sampler. It was something you can take out and sit in the
21 middle of someplace or another and run it. It simply took
22 air through a heated quartz tube to break down the organic
23 chemical so that we could adsorb the chlorine or bromine or
24 whatever halogen was attached to it, and most of the organic
25 chemicals that we had at Dow had a halogen attached. So,

2

1 this was a good, rough-and-ready technique we used.

2 When they came out, we began to use detector tubes.

3 Mainly, the Drager tube was the first one that we had; and,
4 in fact, we had a small program of evaluating detector tubes
5 because we wouldn't use anything until we had proved to
6 ourselves that it worked.

7 We used sampling in saran bags for various vapors and
8 then put the air from the bag into either an infrared
9 spectrometer or another gadget or we took it to the lab and

10 burned it in our own furnaces to determine the halogen in
11 it. Those are the main methods we used.

12 Q Did you have the means to sample for benzene in the
13 air?

14 A Sure. Benzene will adsorb onto silica gel. And then,
15 when the charcoal tubes came out with the battery-powered
16 pumps in the late '50s and early '60s, we began to use
17 those, as well.

18 Q Would benzene have been a material that you would have
19 had present in the Dow plants in the '50s and '60s?

20 A Yes.

21 Q In connection with what kind of processes?

22 A It wasn't something I had anything at all to do with.
23 So, I'm afraid that my memory is hazy. Probably, it was a
24 reactive with a chemical to form chlorobenzene or
25 dichlorobenzene or something on this order; and that was

2

1 further used in something else. But we didn't have very
2 many processes that began with benzene as a raw material,
3 but we had benzene in all the laboratories and so forth.

4 Q You probably had some acquaintance with benzene from
5 your laboratory experiences as a student, correct?

6 A Yes. How did you know?

7 Q That is what I've heard.

8 A No, not at as a student. When I was a teaching fellow
9 at the University of Michigan in the 1952 or '53 era, I
10 worked for a gentleman by the name of Dr. Townsend who
11 taught a laboratory for mechanical engineers to teach them
12 how to do some of the testing things that mechanical

13 engineers did, such as dynability testing and so forth. We
14 were forever using oils in that lab, and his favorite
15 solvent was the constant boiling mixture of benzene and
16 carbon tetrachloride. That was the first time I ran across
17 benzene in the laboratory with any use other than sitting in
18 a bottle.

19 Q Did you learn while you were at school that this was a
20 material that needed to be handled carefully and had health
21 effects?

22 A No.

23 Q Did you learn that at Dow?

24 A Oh, yes.

25 Q I think you have told me before that you really didn't

2

1 get much training at university undergraduate or on your
2 masters level about the health hazards or toxicity of the
3 materials that even a chemical engineer might be working
4 with. Am I right?

5 A You are correct. I got no training in that area
6 whatsoever.

7 Q So, what you learned, you learned at Dow beginning in
8 1953?

9 A Three, yes.

10 Q And how did you go about being taught those things or
11 learning those things about what materials were hazards in
12 the workplace or could be?

13 A First of all, my very first job other than doing the
14 work with silica gel and the various hydrocarbons or health
15 and your hydrocarbons that we used was to read Patty. So, I

16 read Patty's first volume, only volume, of "Industrial
17 Hygiene and Toxicology" from cover to cover and discussed
18 various portions of it with Mr. Hoyle and Mr. Schneider.

19 And then, I went out into the field with these two
20 gentlemen and learned how to do things. It was the
21 apprenticeship route more than anything else.

22 Q All right. Probably the only one that works.

23 A Sometimes it is the only one that works, yes.

24 Q Do you recall, Dr. Peterson, if in the early '50s when
25 you were the apprentice of Mr. Hoyle if he had something

2

1 like an inventory of stressors for the different units in
2 the plant?

3 A He didn't at the time I went to work for him.

4 Q I'm gathering that maybe there came a point when there
5 was. Did you work on that?

6 A Yes, I did. That was one of my first big jobs was to
7 go to every production plant in the Midland area that Dow
8 had and to inventory the materials that were brought into
9 the plant for processing, the by-products of the processing,
10 and the products that they were producing as well as to draw
11 a flow diagram of each process. I did that over a period of
12 about two years and eventually got to every process,
13 including pilot plants and semi-plants in the Midland
14 division area.

15 Q So, this project of yours resulted, then, in a -- some
16 sort of an inventory that was current for each unit in the
17 Midland plant?

18 A Yes.

19 Q Was a similar effort made for other Dow plants in the
20 country?

21 A I don't think so.

22 Q And then, could you tell me how the industrial hygiene
23 department and perhaps the medical department, as well, made
24 use of this inventory of stressors?

25 A Most of the jobs that we got to do out in the plant

3

1 were initiated either through the safety department, which
2 had safety engineers going throughout the plant all the
3 time; and they would see things that we didn't see.

4 Sometimes we got calls from plant superintendents.

5 Sometimes we got a call from somebody at the medical
6 department that they had come across a potential problem.

7 We would, then, use the flow diagram and the inventory
8 of materials to see what we might have to encounter or to
9 look for or to look at when we went out to visit the plant.

10 Q Maybe it would be worthwhile if you could take me
11 through the projects that you remember doing and I know you
12 won't know all of them but the ones that stick in your mind
13 in a chronological order.

14 A Okay.

15 Q And then, we won't -- well, we can approach it in a
16 more organized fashion and move on that way.

17 A All right. Throughout the whole period I was there, I
18 either on my own or along with one of the other fellows in
19 the group would go out and handle problems. We would grease
20 the squeaking wheel, so to speak. So, that started from
21 Day 1 and went on. So that is a continuing thing underlying

22 everything else.

23 The first real project I had was the analytical one
24 that we've talked about already.

25 The next real project I had was this inventory and flow

3

1 diagram project that we have talked about. In doing that
2 project, I became acquainted with every building that Dow
3 had; and at that time, there were a few hundred buildings in
4 the plant. And I saw problems, too, that -- or problem
5 areas or areas where problems might exist and initiated
6 surveys and so forth either by myself or by one of the other
7 fellows.

8 When I was working in the laboratory area, I became
9 aware that many of the laboratory hoods appeared to me to be
10 very inefficient. So that started a project of making a lot
11 of measurements of flow into laboratory hoods and that in
12 turn culminating in a paper that I wrote discussing a method
13 that I devised to evaluate laboratory hoods.

14 Soon after I was in the industrial hygiene group, which
15 we called environmental health engineering, incidentally, I
16 was initiated into the slide talk that the group had
17 developed that was used -- well, developed, really, to
18 introduce the industrial hygiene group to people in a plant
19 that we intended to do a survey in. It became a very
20 popular slide talk; and we quite often were requested to
21 give it by members of the safety department for a safety
22 meeting, even though we weren't intending to visit that
23 plant for any particular purpose.

24 The culmination of the slide talk was to ask people in

25 the audience if they had any questions about the materials

3

1 that they were handling. We used our inventory and flow
2 diagram information to answer those questions, help us
3 answer those questions.

4 That's a preface to the fact that about in the middle
5 of the time that I was there, which would be along about
6 '59, '60, or '61, I was asked by Mr. Hoyle to redo the
7 slides. They were getting old and out of date. So, I got a
8 photographer, a Dow photographer, and we went around and
9 took a bunch of pictures and I culled those pictures and
10 renewed our slide talk.

11 Because I had worked with the laboratories in my
12 laboratory hood investigations, I became well acquainted
13 with everybody in the labs doing research work that might
14 lead to a production process and that began the process that
15 I finally wound up doing and that was helping processes grow
16 from the laboratory bench to a pilot plant to full
17 production and that was the last project I had in the
18 industrial hygiene group.

19 Q And what was it that lead you to leave industry and
20 return to the university?

21 A My wife's nagging. When we married, I had made the
22 remark several times that I had gone back to school after my
23 bachelor's degree with the intention of going on and getting
24 a doctorate. I married my wife instead; and after we had
25 been in Midland for a few years, about six years, in fact,

1 she began to push to leave Midland and go back to school.

2 Seven years later, I acceded to her desires.

3 Q Okay. Well, I can't quibble with that, certainly not
4 now.

5 A No, not now. I -- I wouldn't go back. She did
6 everything just right.

7 Q All right. At Dow, was there any use of your insurers
8 to do surveys or to work with your industrial hygiene
9 department in accident or exposure prevention?

10 A Not with industrial hygiene, no.

11 Q Do you -- are you aware of any cooperation with
12 insurers in the medical department?

13 A No. I know nothing about the insurers at all and
14 whatever they may have done.

15 Q Okay. What were your AIHA committee memberships that
16 you regard as most significant?

17 A Well, they are on my CV; and they are easy to look at
18 there. But the first committee that I got involved with was
19 the Hygienic Guides Committee. I was on that committee
20 from, what, '63 to '73 or something. I don't remember the
21 years now. I'd look at my CV to find out what the years
22 were. And I eventually wound up as chairman of the
23 committee.

24 When I first joined it, the committee was run by
25 Charles Carpenter, who worked for Henry Smith, whom you have

1 mentioned; and Carp did a very good job of running the

2 committee. But after I had been on it for six or seven
3 years, he decided he wanted to do something else with his
4 spare time and asked me to take over the committee for him.
5 I did and decided to change things a little bit, and
6 the change that I tried to institute ruined the committee.
7 We never wrote another "Hygienic Guide" while I was there,
8 unfortunately. I was trying to find a way of getting the
9 people who volunteered to write these things, which is a
10 horrendous task, to get some recompense for what they did;
11 and that was too big a change for AIHA and the members of
12 the committee to accept. And, therefore, they sat on their
13 hands; and I finally decided the only way to get things
14 going was for me to leave and to get somebody else in there,
15 which is what I did.
16 Q Could you tell us, in summary, what a "Hygienic Guide"
17 was?
18 A I have brought some with me, if you would like to see
19 them; but, in summary, they are a small treatise on the
20 industrial hygiene aspects of chemicals. They have physical
21 property information. They have information, in brief,
22 about the toxicological properties of the materials, the
23 hazards of the materials, how to avoid those hazards, how to
24 do the air sampling and so forth that is necessary.
25 Q How far back in time does this project go with the

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1 AIHA?

2 A The early '50s.

3 Q Did you yourself work on authoring any of these?

4 A Oh, yes.

5 Q And what would -- what would have been the sources of
6 information that you used in preparing the "Hygienic Guide"?

7 A Okay. What happened was that I was looking for some
8 information about trichloroethylene and I looked at the
9 "Hygienic Guide" and I was very dissatisfied with its
10 format, more than anything else, and decided to rewrite the
11 trichloroethylene hygienic guide. I did that and submitted
12 my rewriting of that guide to the Hygienic Guides Committee
13 and was promptly appointed a member of the Hygienic Guides
14 Committee.

15 Q That will teach you a lesson.

16 A Yeah, that did. I quit volunteering so much at that
17 point in the game. But at any rate, from then on, we used
18 my format for "Hygienic Guides"; and it is a much better one
19 than had been used previously.

20 Q You said modestly.

21 A I said modestly, of course.

22 Q Okay. But I was asking, I think, what -- and it's kind
23 of a general question.

24 A Where did I get the information?

25 Q Yeah. Where would you turn to to pull this together

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1 and make a concise guide that would be actually useful to
2 somebody that wasn't a real professional with your knowledge
3 and experience?

4 A Well, the guides are written for industrial
5 hygienists. They aren't written for other people.

6 Q All right. Okay.

7 A They are written for -- they are memory joggers, if you

8 will, for industrial hygienists more than anything else. So
9 that they are written for people such as I.

10 But where did I get the information? From the
11 literature. One doesn't write a "Hygienic Guide" without
12 doing a very complete literature search. And then, I
13 occasionally, when I was writing such guides, would use
14 information that we developed at Dow. But, mostly, we
15 didn't use that unless it had been published. People like
16 AIHA and other organizations don't like information that
17 isn't published. So, we would usually wait until the stuff
18 appeared in print before we used it.

19 Q Okay. When you did your inventory at, I assume,
20 Mr. Hoyle's direction back in the -- in '53, '54, when you
21 started that, did he also have you looking for other
22 stressors in the plant besides things that came in as
23 feedstock and went out as product or fell off as
24 by-products?

25 A No. That was my job to do just as I said. But as I

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1 indicated, I was in all the plants; and I would come back
2 and say, "Gee, it seems to me that it's awfully noisy in
3 this plant. I think we ought to evaluate the noise."

4 And because of that, I got also interested in heat
5 stress, which is actually another project that I had that we
6 haven't talked about; and that's what I wound up doing for
7 my Ph.D thesis.

8 So, that kind of thing I would bring back to Mr. Hoyle
9 and to others in the group. We had weekly meetings, as I
10 recall; and we would discuss these things at those meetings

11 and what to do about them.
12 Q How old, roughly, was the industrial hygiene program at
13 Dow when you got there in 1953?
14 A I believe that Mr. Hoyle started the program in 1948.
15 I could be wrong a year or two on that.
16 Q Sure. Did you ever encounter while you were at Dow
17 between '53 and '65 an inventory of nonprocess materials?
18 A No.
19 Q And you understand what I'm --
20 A I know what you are getting at. No.
21 Q -- talking about? No. Okay.
22 A There wasn't any such inventory, so far as I'm aware
23 of. I certainly didn't compile it, and I wasn't aware of
24 anybody who did.
25 Q Okay. If -- if you had been charged with that task,

3

1 would it have been practical and reasonable to maybe just
2 take the TLV list of that time and just look to see which of
3 the described items were present in the plant?
4 A It -- we could have done that. However, at Midland, at
5 any one time, we were handling between 450 and 650
6 chemicals, most of which had TLV's. So that wouldn't have
7 been very helpful.
8 Q When you say you were handling chemicals, I mean, those
9 are the ones that you looked at in your inventory, correct?
10 A Yes. That's correct.
11 Q The ones that were used in the manufacturing process?
12 A Yeah, or in the laboratories.
13 Q Yeah. Okay. And were there TLV's for those

14 400-and-some-odd chemicals?

15 A No, not by a long shot; but most of the materials on
16 the TLV list were ones that we handled in the plant one way
17 or the other.

18 Q Okay.

19 A Not all but most.

20 Q Okay. And as for those materials, let's say, chemicals
21 that weren't on the TLV list in 1953, '54, '55, did it fall
22 on you fellows in the industrial hygiene and the toxicology
23 departments to come up with some standards for exposures and
24 limits?

25 A Certainly.

3

1 Q How -- how did you go about doing that in that period?

2 A Basically, the toxicology lab was in charge of this;
3 and it was done by means of animal experiments, either acute
4 or subacute or chronic inhalation toxicology.

5 Q So, at least by 1953, the Dow toxicology laboratory had
6 the capability to do animal inhalation studies?

7 A Oh, yes. That was another project that I did that I
8 didn't mention. Along about 1955 or something on this
9 order, Dow hired a gentleman to run its vapor inhalation
10 chambers, a fellow by the name of Ted Torkelson. And after
11 he had been there for a year or so, Ted and I traded jobs
12 for six months or a year and I ran the animal inhalation
13 chambers and Ted was the industrial hygienist for that
14 period of time.

15 Q Did Ted stay with the company for years?

16 A Yeah. He -- he retired a few years ago and is a

17 consultant somewhere in Michigan now.

18 Q And would this experience you just described around '55
19 have been your introduction to toxicology?

20 A Well, I had been introduced to toxicology by reading
21 Patty's book. So, that was the real introduction. This was
22 my introduction to hands-on toxicology, if you will.

23 Q Okay. That's the question I should have asked,
24 obviously. And you worked in the inhalation lab at this
25 time?

4

1 A Yes.

2 Q Did you do skin painting there, too?

3 A Not in the inhalation lab. Skin painting was done,
4 sure, from the very start, so far as I know, because one of
5 the things that the toxicology lab was charged with doing
6 was to determine whether this stuff, whatever it might be,
7 was going to be a potential hazard to people and what that
8 hazard would be, whether it would be from getting it on your
9 hide or in your eyes or inhaling it or whatever.

10 Q Did the information that Dow developed in its
11 toxicology lab make its way to the TLV committees of the
12 ACGIH in any way?

13 A Yes, sir.

14 Q How did that happen?

15 A Basically, through publication. The Dow lab,
16 toxicology lab, was a very well-known and very
17 well-respected lab; and they wrote papers and published the
18 results of their papers, whether it was from chronic
19 inhalation toxicology or shorter term work or something more

20 esoteric, such as the metabolism of these materials and so
21 forth. There were papers on all of these subjects that were
22 published by the toxicology lab.

23 Q Were any of the Dow toxicologists actually ex officio
24 members of some of these ACGIH committees?

25 A Not at that time. Later, Ted Torkelson became a

4

1 consultant to the TLV committee without voting rights but as
2 a -- just as a consultant. He is the only one that I'm
3 aware of whoever did this. That was well after I left Dow.

4 Q Well, all right. I was thinking that maybe VK had done
5 some of that, too, that you are aware of?

6 A I really can't talk to VK. I didn't -- I wasn't that
7 close to VK. He was in toxicology, really; and I was in
8 industrial hygiene. Even though Mr. Hoyle reported to VK
9 for a while, I didn't.

10 Q Yes, sir. Can you give me a little more specifics on
11 your work in the laboratory, what kind of projects you
12 worked on in the animal inhalation lab during that year that
13 you did it around '55?

14 A It may only have been six months.

15 Q Okay.

16 A The -- I had two projects, really. One was to make
17 sure that the animals were properly and correctly exposed.
18 The other one was to try and straighten out the fellow who
19 was actually doing the work who was many, many years my
20 senior. He was about ready to retire and he tended to set
21 things up and then leave and that wasn't what he was hired
22 to do.

23 Ted had been unable to straighten him out; and so, I
24 was asked to do so. And that's the hardest job I have ever
25 done in my life. I am not cut out to be a supervisor and I

4

1 learned that very easily and well but I did the job and --
2 even though I may have gotten ulcers from doing so, that's
3 what I did.

4 Q Lord, it may have been harder on that man than you.

5 A It may well have been.

6 Q Maybe that's why they put you over there.

7 A That was one of the reasons for putting me over there,
8 yes.

9 Q Okay. But in terms of the science that you were doing,
10 I mean, were there any particular materials you remember?

11 A I remember isopropyl chloride is one of the materials
12 that we ran while I was there. I think vinylidene
13 chloride. We may have even have run vinyl chloride, but I'm
14 not sure. This has been too long ago.

15 Q Did you ever encounter Don Irish, or was he gone by the
16 time you were there?

17 A Oh, no. I knew Don Irish very well.

18 Q And remind me. What was his position there?

19 A He ran the Dow chemical research lab. He was the
20 director of the lab. He had two assistant directors and
21 then several group leaders, if you will, who reported
22 through one of the assistant directors, Edgar Adams, to
23 Irish. But then, Irish poked his nose in everywhere; and
24 all of us got to know him very well. A great talent.

25 Q And was he a toxicologist by training or a physician?

1 A He was a biochemist by training. He had been hired by
2 the founder of the company and was -- told us many times
3 that he was hired and went to work and said to his boss,
4 "What do you want me to do?" The guy says, "Biochemistry,
5 whatever that is. And do whatever you think needs to be
6 done."

7 So, he eventually established the toxicology lab and
8 shortly thereafter hired Mr. Hoyle to do industrial
9 hygiene. He hired Hoyle from the safety department.

10 Q Would you say that during the years you were there, '53
11 to '65, that the Dow biochemical laboratory was on a par
12 with the best in the country?

13 A Either on a par or better than. It was well recognized
14 as being one of the premiere establishments in the world for
15 what it was doing.

16 Q Okay. You have told me when we visited previously that
17 you never really had anything to do with asbestos in the Dow
18 plants?

19 A Well, I did -- I think I told you that I did one, one
20 survey.

21 Q Excuse me. I misstated. That's right.

22 A Other than that, that's the only one that I had
23 anything to do with asbestos in.

24 Q Okay. Let me start over so we have got just one
25 question and answer, then.

1 I think you told me before that you had had one
2 occasion at Dow to survey for asbestos, and that was in
3 connection with a project that was formulating vinyl
4 asbestos floor tile resins and samples, correct?

5 A Yes.

6 Q Okay. And in your inventory project of the plant, you
7 did not become aware that thermal insulation in the Dow
8 plants in 1953 contained asbestos?

9 A I did not.

10 Q And I believe you told me that even by the time you
11 left in 1965, you were not aware that thermal insulation in
12 the Dow plants contained asbestos?

13 A That is correct.

14 Q Okay. Which is not to say that the Dow plant in
15 Midland did not have asbestos-containing insulation during
16 those years, is it?

17 A Today, I'm sure it did; but at that time, I didn't know
18 it.

19 Q Okay. Now, if you had been using the TLV's, the
20 threshold limit value table or the maximum allowable
21 concentration table or whatever it's called in 1953, to
22 inventory, to help you inventory the plant, would you have
23 found asbestos as one of the materials listed on the table?

24 A I can't speak for Jack Peterson in 1953, but I doubt
25 it.

4

1 Q Well, I --

2 A I didn't have anything to do with the people who were

3 handling asbestos-containing materials.

4 Q Well, I appreciate that; and I'm really not trying to
5 argue that point with you. I was just asking that if the
6 1953 TLV tables list asbestos?

7 A Yes.

8 Q All right.

9 A Absolutely.

10 Q And they also listed silica in 1953?

11 A Yes. They started out listing both materials in 1946
12 and have done so ever since.

13 Q All right, sir. And would benzene also be on the table
14 back as far as 1946?

15 A Yes.

16 Q Would you or did you recognize benzene as a material
17 that was suspected of causing leukemia in the '50s when you
18 started industrial hygiene?

19 A No. We were aware that benzene could cause aplastic
20 anemia, but that was the most severe disease that we were
21 aware of benzene being associated with.

22 Q And that would have been in the early '50s?

23 A Throughout the time I was at Dow, from the early '50s
24 through the mid '60s.

25 Q By the time you left Dow in the mid '60s, had you

4

1 become aware that benzene was suspected of causing other
2 malignancies or leukemias?

3 A I certainly eventually learned that; but when I learned
4 it, I don't recall.

5 Q Did you have anything to do along the way with the CMA

6 or the MCA?

7 A No, not directly. Our representative to that group was

8 Edgar Adams, who was one of the assistant directors of the

9 lab, and Edgar occasionally would talk to those of us in the

10 industrial hygiene group about things that the group was

11 doing or that group was doing but I didn't have any direct

12 input or -- to it or from it.

13 Q Okay. Never made it to a meeting?

14 A Never.

15 Q Do you recall ever seeing any printed material coming

16 out of the CMA that would deal with industrial hygiene or

17 occupational health?

18 A Sure. They had some data sheets, and we had a

19 collection of those data sheets that MCA -- I think it was

20 MCA at that time, --

21 Q It started.

22 A -- Manufacturing Chemists Association.

23 Q Yes, sir.

24 A Yeah, we had them. I had a set in my desk, in fact.

25 Q Would you tell me what you called those?

4

1 A No. I don't recall. Probably the MCA sheets. I don't

2 know.

3 Q Were they like the "Hygienic Guides" or like a

4 toxicological review or like an MSD or what?

5 A Well, they were more like "Hygienic Guides" than like

6 anything else. So far as material safety data sheets are

7 concerned, that's one of the projects all of us had

8 beginning about 1960 or so. We devised our own internal

9 data sheet and then helped fill the darn things out for
10 literally thousands of chemicals. So, that's another thing
11 that I got involved in doing. I was pretty busy. We all
12 were.

13 Q Oh, I don't doubt it. You said that was early '60s?

14 A I believe so. Harold published a paper about what we
15 were doing in the AIHA quarterly or journal about a year or
16 so after we started doing it. So that can be pinpointed
17 rather closely.

18 Q Can you say that these MCA data sheets were available
19 around the time you started with Dow in '53?

20 A I don't remember. I just don't recall.

21 Q Do you recall them as being lengthy or brief? I don't
22 think I have ever seen one, and that's why I am asking.

23 A Yeah. I can understand. It varied depending upon the
24 amount of information available, I should imagine.

25 Q Yeah.

4

1 A But they were generally, as I recall, about four pages,
2 something on that order. That's a vague recollection
3 because it's been a long time since I have looked at one of
4 them.

5 Q Okay. Mr. Adams, would he be deceased by now?

6 A I believe so. It was Dr. Adams.

7 Q Dr. Adams?

8 A Yeah. I'm not sure about that, incidentally; but he
9 was quite a lot older than I, as was Irish and Dunn, the
10 other assistant director. They were all quite a lot older
11 than I was.

12 Q Was Dunn also a doctor?
13 A Yes.
14 Q What was his first name?
15 A Edgar, I believe. Edwin or Edgar. Ed Dunn. Edgar
16 Adams and Ed Dunn.
17 Q Okay. Is there anything -- any other material you can
18 recall that came from or came through the CMA or the MCA
19 besides these data sheets?
20 A No. Incidentally, I hope that I've got that pinpointed
21 and I'm not talking about the things produced by the ASA
22 instead and I could have gotten those two confused. Please
23 don't hold me to that.
24 Q All right, sir.
25 MR. ALMQUIST: Why don't we take a short break

4

1 now.
2 MR. BLANKS: Well, why don't we take a short break
3 now.
4 THE WITNESS: I think that's a good idea.
5 MR. BLANKS: One hour and 8 minutes later.
6 (After the break, the proceedings continued as
7 follows:)
8 Q (By Mr. Blanks) Picking up probably not where we left
9 off, Dr. Peterson, when you do work for Owens-Corning
10 Fiberglass or its attorneys in connection with litigation,
11 what do you charge them?
12 A Oh, I charge everybody the same thing, \$300 an hour,
13 except when I travel on nonbusiness hours, for which I
14 charge \$150 an hour.

15 Q It's a good thing I didn't have any coffee in my
16 mouth.

17 A One charges what the traffic will bear.

18 Q In the -- in the litigation work you have done in
19 recent years, I'm wondering what kind of projects you have
20 worked on, excluding the Owens-Corning Fiberglass expert
21 testimony, if you could summarize that for me.

22 A I already have. I've talked about working for the
23 welding rod defendant companies and so forth. This is what
24 I have done. I have mentioned I have been employed by
25 attorneys representing plaintiffs a few times; but it's,

5

1 basically, everything in industrial hygiene. Let's see.
2 I've done nonionizing radiation, vibration, noise, various
3 gases, various vapors, various dusts, the whole -- almost
4 the whole area of industrial hygiene.

5 Q Other than some earlier testimony for Owens Illinois
6 and the more frequent testimony for Owens-Corning, have you
7 testified in other -- have you testified in other
8 asbestos-related cases?

9 A Yes. I've testified in a Rapid American case or two.
10 I have testified for an attorney representing Unibestos in a
11 Seattle case; and, yes, there have been others. I've gotten
12 involved in some of the marine litigation but never to the
13 point of testimony.

14 Q "Marine litigation" meaning what? Asbestos disease
15 claims for seamen?

16 A Yes. That kind of thing.

17 Q Have you testified for defendants other than asbestos

18 manufacturers in regard to asbestos claims?

19 A Most certainly. We have the previous edition of this,
20 which is premises liability cases. I got involved in a
21 premises liability case or two in the San Francisco area,
22 never to point of testimony, however. It was investigation
23 and reading and so forth.

24 Q Any other premise-type asbestos cases?

25 A None that comes to mind. Although, there could well

5

1 have been. These are fairly recent that I am talking about.

2 Q Okay. In the past, you can't recall any?

3 A No.

4 Q And, of course, in this case or these cases we are here
5 on today, I mean, you are here, really, as a -- well, what I
6 call a precipitant expert. I mean, you are not a retained
7 expert here for me or at this point for anybody else, that
8 you know of?

9 A That's correct.

10 Q And you are here today really not to give opinions so
11 much as to give us your historical recollection on various
12 things that I am asking you about?

13 A That's my understanding.

14 Q Okay. Have you worked on any silicosis cases?

15 A Yes, but not to the point of testimony.

16 Q Were these for sandblasters? No. Let me -- let me
17 re-put that.

18 Did these silicosis cases involve claims by
19 sandblasters?

20 A No.

21 Q What type of occupational exposure was involved in the
22 cases you worked on?

23 A People handling sand; that is, loading trucks with it
24 and delivering it and so forth, as I recall.

25 Q Have you worked on any foundry cases?

5

1 A At one point in my career, I was hired by Conrail
2 people to work on cases that they had. They were mainly
3 workers' comp cases but there were others and they dealt
4 with various things that one encounters in foundries and
5 machine shops. They dealt with silicosis and coal workers
6 and pneumoconiosis, as well as hearing loss. That was way
7 back in the early '80s, as I recall.

8 Q Back to the case or cases involving people handling
9 sand, were you hired by the defendants in those cases --

10 A Yes.

11 Q -- to ascertain whether or not you thought the
12 claimants had had sufficient exposure to silica from the
13 sand?

14 A It never got that far. I was contacted, asked if I
15 knew anything about silica and silicosis; and I said,
16 "Sure. I'm an industrial hygienist."

17 And they said, "Fine. We'll name you as our expert in
18 this case."

19 And I got a two-minute description of what the case
20 was, and that was the extent of it. It never went any
21 further than that.

22 Q Am I right in thinking that silicosis would have been
23 an occupation disease you learned of very early at -- during

24 your time at Dow?

25 A Oh, yes.

5

1 Q This -- this was an occupational disease that was
2 pretty well known by the time you began your work. Am I
3 right?

4 A Yes.

5 Q Would I be right in saying that silicosis was
6 recognized as a serious occupational disease even back into
7 the -- as far back as the '30s or possibly the '20s in
8 certain trades?

9 A Absolutely.

10 Q Okay. Did -- did you have any occasion to encounter
11 silica hazards at Dow in connection with sandblasting?

12 A I recall doing some air sampling inside a sandblaster's
13 hood and so forth; but whether that was at Dow or shortly
14 after I became a consultant, I just don't remember. It
15 could have been either.

16 Q Would you have any other recollections of Dow and
17 sandblasting? And I don't know whether there was any done
18 there or not, but maybe you will recall.

19 A I'm not sure any was done there either. I'm glad you
20 went that far with your questioning. I -- I just don't have
21 any recollection of where it would have been done, if in
22 fact it was done, because I've done a fair amount of silica
23 evaluations as a consultant; and it kind of all runs
24 together. It's all way back in the past now, and I just
25 don't have any separate recollection of silica at Dow.

1 Q Okay. Would I be correct in stating that you
2 certainly, after a couple of years at Dow and a couple of
3 years of training by Mr. Hoyle and self-instruction, that
4 you would have known how to prevent and to limit exposures
5 to silica dust in connection with sandblasting while you
6 were at Dow in 1955?

7 A Yes. This is true.

8 Q And, likewise, are you confident that Mr. Hoyle had the
9 knowledge to deal with any potential silica exposures in
10 connection with sandblasting, had they arisen?

11 A He did.

12 Q Based on your experience and all the training and
13 reading you have done, is it -- is it true that or would you
14 say that it was known how to prevent harmful exposures to
15 silica dust during sandblasting even back in the '40s?

16 A Very probably.

17 Q Did the protective gear that is especially needed for
18 sandblasters, such as the air-fed hoods, exist in the -- in
19 the decades before or, let's say, in the 1940's?

20 A I'm sure they did, yes.

21 Q Okay.

22 A That kind of gear has been around for a long time.
23 When it was first developed, I couldn't tell you. I don't
24 know.

25 Q Okay. How long, approximately, would you say the air

1 line respirator has been around?

2 A It was certainly well-known when I got into industrial
3 hygiene; but how much earlier than that, I really don't
4 know.

5 Q You wouldn't be surprised to see it illustrated in
6 textbooks in the '40s or even late '30s, would you?

7 A No, not at all. It's a natural thing to do. So that,
8 gee, you can go back to writings of the ancient Greeks and
9 the early people in industrial hygiene and occupational
10 medicine in England and France and so forth and Germany; and
11 one of the big problems was silica. They recognized this,
12 and they had ways of handling it.

13 They didn't, in general, recognize that people died
14 from the combination of silicosis and tuberculosis; but
15 other than that, silicosis has been known as a problem for
16 occupations for centuries, probably.

17 MR. BEASON: Objection. Nonresponsive.

18 Q (By Mr. Blanks) I wonder what, based on your education
19 and experience, you would say to this question, Doctor: How
20 long has silicosis been recognized as an occupational health
21 hazard in certain trades?

22 A For centuries.

23 Q When you did your sampling inside the hood, wherever it
24 was, was this an air-fed hood?

25 A Oh, yes, definitely.

5

1 Q Do you recall anything more about this activity than
2 that you did it?

3 A No. I really don't. It's -- I have sampled outside of

4 cabinets that people use with gloves that stick into them.
5 I've sampled once, that I recall, where I went to all the
6 trouble of getting the sampler inside an air-fed hood - and
7 that is a very difficult thing to do - to get a good
8 breathing-zone sample inside one of those things. But I
9 think I only did it once, and I don't remember where or just
10 when.

11 Q Do you -- can you get a good result doing that?

12 A Sure.

13 Q I mean, one you have confidence in with all that air
14 moving around in there in the hood?

15 A Yeah, you can, because all you need to do is use the
16 conventional cyclone sampler where you aren't even handling
17 liquids. You don't have to use an impinger or something on
18 this order. And if you can get this thing attached to a
19 guy's collar and then run the tube that's sucking air
20 through it out from under the drapery of the hood that he
21 fastens around his waist, you are all right; but it takes an
22 especially long tube to do this. And if you wind up with a
23 short tube, you can't do it.

24 Q Have you ever given testimony in front of any
25 government entity in connection with your work or your

5

1 profession or professional opinion?

2 A Yes.

3 Q What would the occasion for that have been?

4 A There were two occasions. The first one was a hearing
5 held by the Occupational Safety and Health Administration
6 concerning a regulation of a chemical that's known by an

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7 acronym MOCA, M-O-C-A. The chemical is
8 methylene-ortho-chloro-amylene. I was asked to testify
9 about the proposed regulation by an attorney representing a
10 Polyurethane Manufacturers Association.
11 A few years later, OSHA came up with what they called
12 the generic carcinogen standard; and the Polyurethane
13 Manufacturers Association people asked me to testify about
14 that, as well.
15 Q The generic --
16 A Generic carcinogen standard. Trying to write one
17 standard for any and all possible carcinogens. I testified
18 that is absolutely impossible. It cannot be done.
19 Q What came of that proposal?
20 A It vanished.
21 Q All right. Did you ever have anything to do with the
22 National Safety Council?
23 A I wrote chapters in the book that was produced by the
24 National Safety Council entitled "Fundamentals of Industrial
25 Hygiene." When the book was in the process of being finally

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1 edited, I took my name off two of the chapters and left it
2 on one.
3 Q Why did you do that?
4 A Because the editing was not to my liking.
5 Q When was this published?
6 A Early '80s, perhaps. I don't remember. I didn't work
7 directly for the National Safety Council. The editor of the
8 book was a friend of mine named Julian Olishifski. Your
9 guess is as good as mine how to spell it. And he was a

10 member of the Chicago section of the American Industrial
11 Hygiene Association and asked me to write some chapters:
12 One on heat stress and one on evaluation of exposures and so
13 forth.

14 Q Which were the two chapters you deauthored?

15 A I deauthored the one on heat stress and -- which is the
16 one I wrote from scratch and got put on as an author in the
17 evaluation chapter, which I had very little to do with
18 except that the actual author of it, Dr. Hermann, had
19 cribbed stuff from my book to write the chapter. So, he put
20 me on as an author of it.

21 There was another chapter, too; and I don't even
22 remember what it was that I took my name off.

23 Q Okay. Can you think of any other dealings with NSC?

24 A No.

25 Q You never went to any of their meetings?

5

1 A Once I attended a meeting in Chicago. I -- but that's
2 the full extent of it. I didn't join the group; and I
3 didn't join any of its parts, either.

4 Q Roughly, what -- what time frame would you have gone to
5 that annual meeting?

6 A Oh, probably in the late '70s.

7 Q And am I right in recalling that the NSC publications
8 would have been available in the Dow library, one or more of
9 the libraries?

10 A Oh, certainly. Probably at the safety department. I
11 don't think we had any of them in the industrial hygiene
12 group.

13 Q Okay. Do you -- can you think of anybody else that you
14 worked with at Dow who would have been a member of the
15 National Safety Council?

16 A No. Just the safety people that we had. Probably all
17 were members, so far as I know. I never asked them.

18 Q Did you ever attend any American Public Health
19 Association functions?

20 A No.

21 Q You never belonged to that, either?

22 A Never belonged to it.

23 Q Did you ever get any of their publications?

24 A Well, I've -- no. I never subscribed or purchased any
25 of their publications, no.

6

1 Q Okay.

2 A I have run across papers --

3 Q Sure.

4 A -- published in the APH Journal, but that's the extent
5 of it.

6 Q That's the name of their periodical, the "American
7 Public Health Journal," as you remember it?

8 A "APHA Journal," probably. I don't remember. I don't
9 put much stock in the stuff they publish. So, I don't
10 ordinarily collect that kind of stuff.

11 Q Well, why do you say that?

12 A The papers that I have read in -- that appear in that
13 journal appear to me to be, generally, more political than
14 scientific. So, I just ignore them.

15 Q Do I recall correctly that somewhere along the way you

16 became involved with the ACGIH?

17 A I joined the ACGIH in the mid '80s when I was teaching
18 at the University of Wisconsin Parkside campus. Then, I
19 remained a member for two or three years, until all of a
20 sudden it was realized by ACGIH that I was no longer
21 teaching full-time; and I was demembered.

22 Q Dismembered?

23 A Dismembered. A couple of years later, they established
24 the category of affiliate member; and then, I joined, mainly
25 because then I would get the TLV booklet automatically and

6

1 so forth.

2 Q Okay. And were you ever on the TLV committee of the
3 ACGIH?

4 A No.

5 Q So, if I asked you how that committee worked over the
6 years, you really wouldn't have any direct personal
7 knowledge of that, would you?

8 A No. Just it would all be hearsay and stuff that I have
9 read and talked about. I know Herb -- Herb Stockinger quite
10 well, for instance.

11 Q Yes, sir.

12 A And I have talked to him about what goes on at the TLV
13 committee meetings, how they operate and so forth; and he
14 has written about this and I have read the stuff that he has
15 written.

16 Q How far back does Mr. Stockinger go?

17 A Dr. Stockinger goes way back. He is older than I. He
18 ran the toxicology group for the US Public Health Service;

19 and then, when NIOSH took over that kind of activity, he ran
20 that group for them, as well. He was chairman of the TLV
21 committee for a few years, a member for many more.

22 Q Is he still around?

23 A So far as I know.

24 Q Where in the world would we find him? Do you have any
25 idea?

6

1 A I would look in Cincinnati. I think that's where he
2 made his home. Either that or look for places that sell an
3 awful lot of the red hot sauce. What a crime. He put it on
4 everything.

5 Q Okay.

6 A NIOSH people may know where Herb is, if he is around.

7 Q Did you meet him early on in your Dow years, or did
8 this come much later?

9 A Oh, it was early on.

10 Q That you would have encounter him, what, at AIHA
11 activities?

12 A Yes. That's correct.

13 Q And I guess you wouldn't know whether anybody at Dow
14 ever had any direct input into a particular TLV or not at
15 any time, would you?

16 A No.

17 Q I wonder if you ever encountered the Texas Chemical
18 Council?

19 A No.

20 Q How about the National Petroleum Refiners Association?

21 A No.

22 Q How about the Permian Basin Landman's Association?
23 A What? No. I have never even heard of them.
24 Q It's not. I made it up.
25 A Oh, okay.

6

1 Q Let me, as we are moving very rapidly through the
2 material here, ask you about any contacts you remember with
3 the State Health Department in Michigan while you were at
4 Dow.
5 A Yes.
6 Q And I'm assuming there was one?
7 A There was one. All the time I was an industrial
8 hygienist at Dow, there was.
9 Q Now, Michigan was actually -- would have been one of
10 the first states to develop an industrial hygiene department
11 in the State Health Department, wasn't it?
12 A That's correct.
13 Q And I guess because of the automotive industry and the
14 other industries that were tied to it? I mean, like --
15 A Well, Michigan is an industrial state. So that's the
16 reason for the development of industrial hygiene there.
17 Q Can you tell me a little bit about the State Health
18 Department and how it related to whatever you all were doing
19 at Dow?
20 A The representative of the industrial hygiene group who
21 had Dow as part of his territory was a gentleman by the name
22 of Russell Scovill. Russell would show up at the biochem
23 lab about every six months and would -- we would all get
24 together and talk. He was there, mainly, to find out what

25 was new in industrial hygiene from us. He never took a

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1 plant tour, never went out of the biochem lab, so far as I'm
2 aware.

3 Q Okay.

4 A He eventually wound up on the TLV committee,
5 incidentally.

6 Q I gather that it would not have been the practice in
7 the '50s or up to the mid '60s, while you were at Dow, for
8 the Michigan State Health Department to come in and make an
9 inspection of the Dow plant?

10 A We always offered that to Russ, if he wanted to do so;
11 but he was using us as a resource. He wasn't about to come
12 by and second-guess us for what we were doing.

13 Q Well, I wasn't suggesting anything sinister or
14 otherwise; but do you know whether or not the State Health
15 Department even had the power or the authority during those
16 years to enter a plant and make an inspection without the
17 consent of the plant owner?

18 A I don't know that for sure, but I doubt if they did.

19 Q Yeah. I mean, in your experience, that probably would
20 have been the case, then, with many, if not most, of the
21 states during the pre-OSHA period, correct?

22 A Yes. That's, in fact, one of the reasons for the
23 development of OSHA.

24 Q I am -- I gather, correct me if I am wrong, that this
25 was one of the legal facts that handicapped the US Public

1 Health Service from perhaps doing more extensive work in
2 investigating occupational health hazards in the decades
3 before OSHA?

4 A Well, that could well be. However, I never talked to
5 anybody who was in the Public Health Service at that time
6 that looked upon it as a handicap because mostly when they
7 wanted to go in someplace, they'd just simply go and ask to
8 go in; and they were usually invited in, in my circles,
9 anyway.

10 Q Oh, okay. Okay. Did you do any work at Dow that you
11 know became part of an epidemiology study?

12 A Epidemiology studies were done at Dow. Whether any of
13 the work that I did became part of them, I'm not positive.
14 I certainly had no input into the writing of such reports.
15 But I did a lot of sampling hither, thither, and yon and, in
16 fact, developed, along with a guy from the physical research
17 laboratory, a device that enabled us to sample automatically
18 from several different places in a plant and I believe that
19 that kind of data were incorporated in a paper, an
20 epidemiological paper, but I had nothing to do with it.
21 That's as close as I came to the sort of thing you are
22 talking about.

23 Q Okay. Do you know if Dow ever did a or had done an
24 epidemiology study about the health of its plant workers or
25 retirees?

1 A They have done -- they have done several.

2 Q How far back in time do you place these epistudies?

3 A Well, there are two portions to that. One is when the
4 people work there. That is when the exposures existed and
5 when they were analyzed, so far as looking at other
6 employees and so forth.

7 We did a study of hearing loss in people, which is sort
8 of an epidemiological study; and I had a little hand in
9 that, incidentally.

10 I know that the Dow medical department did a study of
11 people who had been exposed to arsenical insecticides
12 manufactured at Dow and, in fact, were instrumental in
13 showing that arsenic was a carcinogen.

14 I know they have done epidemiological studies of people
15 exposed to benzene and a few other compounds, but I had
16 nothing to do with these. I just know it's been done. They
17 have been published. When, I couldn't tell you.

18 Q Okay. Okay. Would you say that in that 12-year period
19 you were at Dow that you had sufficient staff to do the
20 necessary industrial hygiene work?

21 A Never. There was always far more work than we could
22 handle, and we kept looking for other people to join our
23 group. The group expanded to the point where it is several
24 tens of people now.

25 Q Were there any other large companies that were in your

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1 vicinity, chemical companies or petroleum companies with
2 whom you had dealings while a Dow employee?

3 A Well, there weren't any chemical or petroleum companies
4 nearby physically. At the annual meetings of AIHA, I met

5 people from DuPont and Carbide and Westinghouse and Shell
6 and Exxon and so forth; but we didn't have any direct work
7 with these people.

8 Q Did you ever have occasion to visit the plants of any
9 of these gentlemen that you met from other petro or chemical
10 companies?

11 A I have visited several petrochemical company plants,
12 but it's been not in conjunction with my acquaintanceship
13 with industrial hygienists who work there. It's all been
14 litigation, really.

15 Q As an expert for the company whose plant you were
16 visiting?

17 A Not necessarily. Not necessarily. I visited a couple
18 of plants at the behest of Owens-Corning Fiberglass
19 attorneys, for instance.

20 Q Okay. Do you remember any folks from DuPont that you
21 became acquainted with at your annual meetings and
22 professional activities?

23 A Yes. I knew John Zapp before we died and Dorothy Hood
24 was his right-hand person and Dorothy was on a group of us
25 or in a group of us who went to China together and I got to

6

1 know Dorothy fairly well on that trip.

2 Q Anybody else?

3 A Those are the only ones at DuPont that I recall.

4 Q Okay.

5 A They had a different organization. They didn't do
6 things centrally. Their people were scattered all over the
7 place, and we very seldom saw them anywhere.

8 Q Did you ever go to the Haskell Lab in Delaware?
9 A No. I know of the Haskell Lab and I have been in
10 Bloomington but I haven't been to the Haskell Lab.
11 Q Okay. Who do you remember meeting from Exxon?
12 A The person I knew best is Dick Brief. I got to know
13 him well because he and I were both doing ventilation work,
14 laboratory hood work and so forth and publishing papers.
15 Gee, who else do I know at Exxon?
16 Q Well, you've mentioned Jim Hammond?
17 A I know Jim Hammond. He was in Texas. Dick is in New
18 Jersey.
19 Q How about Van -- excuse me.
20 A Huh?
21 Q How about Van Hendricks?
22 A I don't think I ever met Van Hendricks. I met people
23 who worked for Dick Brief in New Jersey. I was there on a
24 project as a consultant doing a walk-through of various
25 places and met several of the people there. I don't

6

1 remember their names right offhand.
2 Q Okay. How about Shell people?
3 A The person I knew best at Shell, the first one I knew
4 was Norm White. Norm was their toxicologist and I kibitzed
5 a poker game at the first AIHA meeting I went to in 1956
6 when Harold Hoyle and V.K. Rowe and Norm White and perhaps a
7 couple of other fellows were playing poker and I was not
8 enough of a poker player to join with them and, besides, I
9 knew better than to stick my head in a nest of alligators.
10 They were good. So, I've -- I've known Norm ever since

11 then, until he died. I got -- I haven't met him since.

12 Howard Kuznitz was the more or less replacement for
13 Norm. He was hired from NIOSH by Shell, and Howard has
14 become one of my best friends.

15 Q Is he still down in the Texas area?

16 A Yeah. He is in Houston.

17 Q Maybe we'll get to visit with him soon.

18 A Good.

19 Q I'll give him your regards.

20 A Please do.

21 Q Has Norm White died?

22 A I think so, yes. He was quite a bit older than I, but
23 I don't know. I know he retired from Shell and I think he
24 was sick at the time but I just don't know.

25 Q Huh. Okay. Let's see. Did you ever make the

7

1 acquaintance of Dr. Skeepers along the way?

2 A No. I never met him. I have crossed swords with him a
3 couple of times but it's been by correspondence and in
4 litigation but I never met the gentleman.

5 Q How about Bill Hazard?

6 A Oh, yes. I knew Bill Hazard quite well.

7 Q And this was from your professional work?

8 A Yes. I met him at one of the AIHA meetings. I was
9 introduced to him by probably Harold Hoyle or V.K. or one of
10 the other people from Dow and followed his career from then
11 on.

12 Q What was Mr. Hazard's reputation in your professional
13 field?

- 14 A Oh, great. Very good. Good man.
- 15 Q You say you crossed swords with Dr. Skeepers. What --
- 16 what were the topics of your disagreement?
- 17 A One was a lawsuit in New Jersey, I believe, where a
- 18 gentleman had died of a lung cancer. Dr. Skeepers on the
- 19 basis, apparently, of one of the medical reports called it
- 20 mesothelioma. The toxicologist -- not the toxicologist, the
- 21 pathologist, on the other hand, said it was adenoma
- 22 carcinoma; and I wrote a report saying so. And then, he
- 23 changed his report because of what I wrote and, in fact,
- 24 changed his report a third time before the trial.
- 25 Q Okay. Do you regard yourself as a toxicologist?

7

- 1 A Sure.
- 2 Q Just so I'll have a clear picture, what do you do to
- 3 become trained as a toxicologist other than this -- after
- 4 that six months or a year stint in the Dow lab?
- 5 A The toxicology that I have done has all been in
- 6 conjunction with either animals or people breathing things
- 7 and analyzing the results. When I worked at the Medical
- 8 College of Wisconsin after leaving Dow and getting my Ph.D,
- 9 all the work I did there was as a human inhalation
- 10 toxicologist.
- 11 Q You mean, you were using humans to do your experiments?
- 12 A Yeah.
- 13 Q These were just, what, for irritants?
- 14 A No. We did a lot of work with carbon monoxide. Most
- 15 of the work that we did to the humans involved were with
- 16 staff. I was one of those that was exposed, but mostly my

17 job was to expose others. Again, on the staff, until we
18 needed more volunteers; and we got -- we hired people to act
19 as volunteers for exposures. And then, we got a contract
20 with NIOSH through Herb Stockinger to do the human
21 inhalation toxicology on a group of 12 solvents; and we
22 spent about three years working on that project and never
23 did complete it, incidentally, and lost our contract.

24 Q It's a good thing. Well, when you are doing that, what
25 do you do? Do you expose people to known concentrations;

7

1 and then, you do blood sampling and urinalysis and such as
2 that?

3 A And such and such and such, yeah.

4 Q Okay.

5 A Basically, we were looking for behavioral changes,
6 trying to see if we could determine results of exposure
7 without invasive techniques. We did breath analysis. We
8 did blood analysis, urinalysis, and then, all sorts of tests
9 of the people. They were always exposed at or below the
10 threshold limit value.

11 Q You didn't lose anybody, did you?

12 A No, not by a long shot.

13 Q Okay. You haven't done any follow-up on them now to
14 see what's happened since your experiment, have you?

15 A I'm -- I'm one of the people who was exposed, sir.

16 Q Well, it kind of speaks for itself then.

17 A It sure does. All of my deficits result from that.

18 Q Let's jump back a second to the folks you knew from
19 other companies. I think I heard you say Carbide was a

20 company whose scientists or hygienists you encountered. Do
21 you remember specifically any folks from Carbide?
22 A No, I don't.
23 Q Well, certainly, they are more memorable than that?
24 A None come to mind at the moment.
25 Q How about -- how about Newt Ketcham? Do you remember

7

1 him?
2 A No. I don't think I met Newt. Oh, wait a minute. Who
3 was it from Carbide that I knew? Newt? No. It wasn't a
4 Newt.
5 Q There was a Newell Bolton?
6 A Newell Bolton. I knew a Newell Bolton, yes. He was
7 from Carbide. Oh, gee, there were a couple of other guys
8 whose names escape me.
9 Q Bob Peele?
10 A No. Never met Peele.
11 Q Ketcham was trained at Harvard under Drinker about the
12 time you started at Dow, if I remember right. It don't ring
13 a bell?
14 A No. It doesn't ring a bell at all.
15 Q Okay.
16 A Newell Bolton, that's it. Newell Bolton not Newt.
17 Newell Bolton, yeah.
18 Q Well, it was Newt Ketcham --
19 A Yeah.
20 Q -- and Newell Bolton?
21 A And Newell Bolton, yes.
22 Q All right.

23 A I didn't know Ketcham. I know Newell quite well.
24 Q I think he went on up to the top headquarters.
25 A Pretty much.

7

1 Q Now Hilton Head?
2 A Yes. He is at Hilton Head, as I recall.
3 Q Okay. Along the way in your education and training,
4 did you acquire any foreign languages?
5 A Yes.
6 Q Which ones?
7 A I, at one time, could read French and German with some
8 facility.
9 Q There was a sneeze there. You said you could read
10 French and German?
11 A Yes.
12 Q This was the requirement; and I propose the acquired
13 ability to deal in a foreign language was not unusual in a
14 technical education in the years you went to school, was it?
15 A No. It was not at all unusual. I actually started
16 with German and Spanish in high school, as I recall.
17 Spanish in high school. German in college. And then, when
18 I was working on my Ph.D, I took a couple of four hour
19 courses in reading scientific German; and, along with my
20 best friend at college, we taught each other how to read
21 French.
22 Q That's impressive. While you were at Dow, could you
23 point to any individuals who were responsible for kind of
24 staying current on the literature in the industrial hygiene
25 field?

1 A All of us in the industrial hygiene group had that
2 responsibility.

3 Q Okay. And was it the case that all of you in the
4 industrial hygiene group lived up to that responsibility?

5 A We did our best. Those of us who had specific areas of
6 expertise, for instance, Mr. Schneider, Ed Schneider, was
7 our noise expert; and he read far more noise literature than
8 I did. But I tried to keep up, as he did, and we had
9 meetings and in these meetings we discussed what was going
10 on.

11 Q So, one benefit of the meetings was exchanging
12 information that you might have had a particular interest in
13 that somebody else's specialty wouldn't cover?

14 A Yes. Well, for instance, I was doing this work on
15 laboratory hood ventilation and I kept the group abreast of
16 not only what I was doing but what Mr. Brief and others were
17 doing in that area.

18 Q Okay. And so, there was a bit of, what shall we say,
19 cross-pollination occurring between you guys as topics of
20 interest were read about?

21 A Oh, yes, always. We had another input to that in that
22 monthly the heads of industrial hygiene, safety, and medical
23 would meet; and we would get input through Mr. Hoyle from
24 that meeting. And, occasionally, we would be invited to the
25 meeting to talk to the group there about what we were doing

1 or what we knew was happening or whatever.

2 Q Okay. So, not only was this something that you
3 gentlemen in the Dow, what, biochemical?

4 A Well, it would be the industrial hygiene group of the
5 biochemical lab. We didn't meet with the toxicologists or
6 with the organic chemists or the wood preservative people or
7 whatever. We just met within our own group there.

8 Q Okay. Well, within your own groups not only -- within
9 your own group, not only did you industrial hygienists as a
10 matter of just professional interest share new knowledge but
11 it was -- it was actually built into the job that you would
12 do so because there were routine or periodic meetings for
13 that purpose?

14 A Yes.

15 Q Is that right?

16 A That is correct.

17 Q And I gather where you said there were monthly meetings
18 between the department heads of industrial hygiene, safety,
19 and medicine for the sharing of information that this, too,
20 was institutionalized at the level above you?

21 A It was.

22 Q So that it really wasn't something that was left to
23 chance at Dow, I believe?

24 A No chance at all. It was a monthly thing that
25 everybody -- they did every month without fail. They had

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1 lunch over at the medical department and had a meeting.

2 Q Did -- did the medical department report to industrial

3 hygiene at Dow while you were there instances of suspected
4 occupational disease in the workers in the plants?

5 A Absolutely. The one sampling I did for asbestos
6 evaluating exposure there was at the behest of the medical
7 department.

8 Q And then, I am remembering that the doctor had had some
9 reason to be concerned about the particular man or men
10 involved in that work?

11 A No. The gentleman was ill, and the physician wanted to
12 rule out occupational exposure and couldn't do that without
13 a knowledge of what those exposures were and so asked me to
14 -- well, asked the industrial hygiene group; and I was the
15 one picked to go over and do the work.

16 Q I believe you said that your best memory of that was
17 that you did that monitoring in the vinyl asbestos floor
18 tile project area in 1958. Is that --

19 A That's what I said, yes. Since that time, I have
20 forgotten the date; and it was recalled to me when I read
21 the transcript of the previous portion of this deposition.

22 Q Is that still a good date?

23 A Yes. I think so.

24 Q Okay. Was that a survey that a written report would
25 have been made on?

7

1 A Yes.

2 Q And would that report have your name on it?

3 A Yes.

4 Q Were you provided or shown a copy of that report?

5 A Duncan Stewart showed me a copy of that prior to our

6 previous meeting and then retrieved it from my hands, and I
7 haven't seen it since.
8 Q Oh. I wonder if Mr. Almquist would have a copy of it
9 at this time because --
10 MR. ALMQUIST: We're coming up on our lunch break,
11 and I'll check and see.
12 Q (By Mr. Blanks) I confess. I have not -- I don't
13 think I've seen it. Well, now, Dr. Peterson, do you -- do
14 you appreciate that there has been sampling or monitoring --
15 what do we call it? Do we call it sampling or shall we call
16 it monitoring?
17 A Air sampling is a much more limited thing than
18 monitoring. Monitoring is following an exposure over an
19 extended period of time, generally, using air sampling
20 techniques. So, --
21 Q Okay. So, here we would be talking about sampling?
22 A Yes.
23 Q All right.
24 A This was sampling one or two days, no more than that.
25 Q Do you appreciate that there had been sampling done in

7

1 this work area at Dow earlier than your 1958 effort?
2 A Yes. I believe Mr. Schneider was the one who went over
3 and did the work.
4 Q This would have been maybe on the third floor of
5 Building 433?
6 A Yes, sir. Absolutely. Plastics technical service.
7 Q Okay. Who was Mr. Johann? Do you remember that name?
8 A Stan Johann was an engineer that we hired who worked

9 with our group for a short period of time and then left.
10 Q Did you have the benefit of his report from 1955 when
11 you went in 1958 to sample again that area?
12 A I don't have any independent memory of that. So, I
13 can't answer your question. I don't know.
14 Q Was the --
15 A I would say probably, but I don't know.
16 Q Was the routine or the procedure at Dow for you to go
17 and look at reports of prior sampling efforts before you
18 would go out and do a new one?
19 A Generally, yes.
20 Q Was it the case that these reports of sampling were
21 kept in the files in your department there at Dow?
22 A They were.
23 Q How were they organized?
24 A That's a good question.
25 Q Thank you.

8

1 A You are welcome.
2 Q I've been trying all morning to get a good question
3 out.
4 A I knew you would get there sometime.
5 MR. JONES: He had more confidence in you than we
6 did.
7 MR. BLANKS: Somebody is supposed to object now.
8 A We had two ways of getting to reports. One was by
9 building, if I remember correctly. And then, we had another
10 outside index that was a very peculiar kind of filing system
11 that had a tabbed card for this kind of work that we did;

12 and we could trace something down that way. But beyond
13 knowing that there were these two things, I can't give you
14 any further details. I just don't remember.

15 MR. FLATTEN: I think that is Art's stomach.

16 MR. BLANKS: Lord have mercy. Did you pay extra
17 to get this?

18 MR. ALMQUIST: I had nothing to do with the
19 arrangements, Mr. Blanks. That was strictly your doing.

20 Q (By Mr. Blanks) In 1950 -- gee. In 1955, as best you
21 remember it, what would have been the sampling device that
22 should have been used at Dow to sample for asbestos in the
23 air in Building 433?

24 A It depends. What I used was a membrane filter method;
25 and I did this deliberately, knowing that the midget

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1 impinger was the method of choice. I had taken too many
2 samples with the midget impinger and spoiled them. It's a
3 very difficult procedure to use. So, I used the membrane
4 filter; and I realized that the membrane filter is a far
5 more efficient method of picking up particles and fibers
6 than was the midget impinger. And, therefore, it was a
7 conservative method. I used that, had it analyzed at the
8 analytical lab, and reported what my results were.

9 Q But you jumped right around my question. What --

10 A What method should I have used?

11 Q No. No. No. In 1955, --

12 A Uh-huh.

13 Q -- when Mr. Johann made a survey of Building 433, what
14 device would have been available to use?

15 A Available? Midget impinger, electrostatic
16 precipitator, cascade impactor, AISI tape sampler, filter
17 paper sampler. I don't know whether the membranes --
18 membrane filters were developed by then or not. It was
19 about that period of time that the mixed cellulose ester
20 membrane filter appeared on the market. So that would have
21 been another thing he could have used. There were others,
22 too. We had, oh, perhaps a dozen different ways of sampling
23 the air for particulate material.
24 Q But to get a sample that you could compare against the
25 TLV, what would you have had to use?

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1 A The best way of doing that would have been to use the
2 midget impinger because that is the method that Dreessen and
3 his bunch used to gather the data that eventually became the
4 TLV.
5 Q I'm out of tape.
6 A Oh.
7 Q You may have run --
8 A You will just have to rely on your memory then.
9 Q -- 30 seconds or 11 seconds.
10 MR. ALMQUIST: This will probably a good lunch
11 break.
12 MR. BLANKS: Do we get to stop for lunch?
13 MR. ALMQUIST: Yeah, we do.
14 MR. BLANKS: Okay.
15 THE WITNESS: Absolutely.
16 MR. BLANKS: Are you taking us to lunch? I'm
17 taking you to lunch?

18 (After the lunch break, the proceedings continued

19 as follows:)

20 Q (By Mr. Blanks) Okay. Dr. Peterson, we've returned
21 from lunch; and I think we were talking about using the
22 midget impinger to sample for compliance with the TLV
23 standards because the midget impinger was the method used to
24 do the sampling that the TLV standards were based upon.

25 A That's correct.

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1 Q Okay. And that's the way Mr. Hoyle taught you or you
2 read it or both when you started early with Dow, right?

3 A Sure. That's right.

4 Q And am I right in remembering that while at Dow you did
5 not use a midget impinger, ever, to sample for asbestos in
6 air?

7 A That's correct.

8 Q And you did use a membrane filter to sample for
9 asbestos in air in 1958, you said?

10 A Yes.

11 Q Now, are you really pretty sure about that date and
12 that method?

13 A I'm sure about the method. The date is being quoted by
14 me today after reading the previous transcript of this. I
15 don't have an independent recollection of the year. I'm
16 sorry.

17 Q I was just -- I'm not arguing with you but just
18 thinking that that might be a few years early for the
19 membrane filter method. I don't know.

20 A I don't think so. No.

21 Q You don't think so?

22 A Millipore Filter had come out with their filter
23 sometime in the late '50s and I don't recall exactly when
24 but we were right on that technology and using it as soon as
25 the technology was available.

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1 Q And you also mentioned using a Bausch and Lomb dust
2 counter somewhere along the way as one of the devices that
3 would have been in the arsenal back in the early '50s.

4 A We had at least one, maybe more, B&L dust counters,
5 yes.

6 Q And that device gave you, like, kind of a quick and
7 dirty sampling tool. Would that be fair?

8 A It's certainly quick. So far as being dirty is
9 concerned, it is more conservative than the impinger because
10 the illumination used to examine the particles is dark field
11 rather than light field; and with dark-field illumination,
12 one can see a lot more particles than one can see with
13 light-field illumination.

14 Q But the B&L dust counter was not really the right
15 device to use if you were going to be sampling against the
16 TLV standard, correct?

17 A That's correct. It wasn't; but it was the one used,
18 for instance, by Fleischer and Drinker and Hugh in 1946 and
19 they knew that as well. But it's handy. It's quick, and
20 you -- it does not require a transfer of liquids in the
21 field. It's a nifty device. I used it several times at Dow
22 but never for asbestos.

23 Q When was it, as best you understand, that Dow began to

24 collect information on incidents of occupational disease in
25 its own work force?

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1 A I can't answer the question. I don't know.

2 Q Was this being done when you came to the company in the
3 early '50s, as you recall?

4 A So far as I'm aware, it was.

5 Q Do you know, Dr. Peterson, if any of your colleagues at
6 Dow attended the -- that late 1964 symposium in New York
7 that was held at Mount Sinai on asbestos?

8 A I don't know.

9 Q You never heard?

10 A So far as I'm aware, none of our crew went there.
11 However, a toxicologist could have gone. I wouldn't have
12 been aware of it.

13 Q All right.

14 A But none of the industrial hygiene crew attended.

15 Q In any event, you would have had the proceedings
16 available in publications whenever they appeared in print
17 from the Mount Sinai and Dr. Selikoff symposium, right?

18 A Yes.

19 Q Mr. Almquist has handed me a document that looks like
20 it was Exhibit No. 3 in Mr. Hoyle's deposition from three or
21 four years ago. It's dated January 22nd, '58, and
22 apparently by a J.E. Peterson. Let me hand that over and
23 see if you recognize that as the report that you talked
24 about earlier on the asbestos sampling at Dow?

25 A It is.

1 MR. BLANKS: With your consent, Mr. Almquist, I'm
2 going to make a copy of this and attach this to the
3 deposition as Exhibit 580122 capital DOWC.

4 MR. ALMQUIST: You have my permission. You do
5 have a copy of it already, I'm sure, in the exhibits to
6 Mr. Hoyle's deposition.

7 MR. BLANKS: Somewhere. Somewhere, but I didn't
8 bring all of Mr. Hoyle with me, unfortunately. So, we'll
9 make a copy and provide that to the reporter.

10 MR. ALMQUIST: Sure. You've identified what that
11 is?

12 THE WITNESS: Yeah. Yeah.

13 MR. ALMQUIST: I don't want my copy to get away
14 from me.

15 MR. BLANKS: No. I -- I understand. That's why I
16 keep pulling it away from you.

17 (Marked Exhibit No. 580122 DOWC and is attached
18 hereto.)

19 Q (By Mr. Blanks) Just out of curiosity, is there a
20 place in the report where we would likely read about the
21 methodology you used?

22 A Sure. There -- there must be. That's the way -- I
23 always did it that way.

24 Q Okay. You'll recognize the format better than I. So,
25 perhaps you could look.

1 A Oh, for goodness sake. I used the B&L dust counting
2 microscope - how do you like that? - and electrostatic
3 precipitator.

4 Q Well, I really wasn't trying to lay a trap here for you
5 because I --

6 A Well, that's fine.

7 Q I don't remember having seen this thing before.
8 Although, I'm sure I did somewhere.

9 A Apparently, I used the B&L dust counter and an
10 electrostatic precipitator in the analysis. I thought it
11 was a membrane filter.

12 Q Well, I understand. So, it's possible, then, the
13 membrane filters came out a little after this 1958?

14 A It certainly is possible. Now, you also asked if I had
15 seen Stan Johann's report; and I mention it in this report
16 that I had seen it.

17 Q Oh, okay. Now, I had the impression, perhaps wrong,
18 that this Bausch and Lomb dust counter device had a
19 magnifier built into it. Am I wrong about that it?

20 A It is a magnifier. The B&L dust counter consists of,
21 actually, about three different pieces, all in one
22 apparatus. It only weighed about two or three pounds.
23 There was a tube that was about three-quarters of an inch in
24 diameter and about six inches long that one would put some
25 wet blotting paper in.

1 And then, using a squeeze bulb, one would suck air into
2 that tube and let it sit there for a few seconds until the
3 air became saturated with water vapor. And then, you pulled

4 a plunger, either halfway out, it was marked, or all the way
5 to determine the amount of air that was being sampled.

6 The air that was being sampled went through a slot.
7 And when it got through the slot, it expanded; and the
8 expansion cooled the air. And because everything was cool,
9 the water vapor condensed on all of the particles there.
10 Just beneath that slot was a microscope slide that could be
11 rotated to contain, I think, about 32 samples, if I remember
12 correctly.

13 That was the sampling that was done. So, you could
14 squeeze the squeeze bulb, get a sample in there. The
15 squeeze bulb flushed this tube. It didn't do anything else,
16 just flushed the tube with air, and you'd squeeze it a few
17 times, take a sample, and you were ready to take another
18 sample a minute later, if you wanted to do it that way.

19 Later, one would use the built-in microscope, which was
20 a dark-field microscope with dark-field illumination built
21 in so that the particles appeared in a line because they
22 were beneath this slot in the apparatus and were separated
23 and appeared like stars in a dark sky. And that's the
24 so-called dark-field illumination. So that you could see
25 many more and much smaller particles than you could with the

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1 light-field illumination used on midget impinger samples.

2 Q And was this about a -- okay. That is the most clear
3 picture I have heard of that device. Thank you.

4 A Good. You are entirely welcome.

5 Q Did -- what, was there some sort of a sticky medium on
6 the slides to catch these particles to hold them there like

7 a Vaseline?

8 A Some people used that, used Vaseline. We never did.

9 The thing is, the particles were wet; and they stuck to the

10 slide because they were wet when they hit. And then, the

11 water would evaporate and leave the particle.

12 Q Would the -- was the magnification, what, on the order

13 of about 100 power?

14 A I don't recall the magnification.

15 Q Okay. Do you remember using at Dow the textbook

16 "Industrial Hygiene" edited by Lanza and Goldberg, per

17 chance, from about 1939?

18 A I don't believe so. I don't think I have seen that.

19 Q How about a text called "Industrial Toxicology"? Does

20 that ring a bell?

21 A Fairhall, yes.

22 Q That's one you all would have had there?

23 A Yes.

24 Q I think you said that earlier.

25 A Yes. We did have Fairhall's text. In fact, we had two

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1 or three copies of it, at least.

2 Q And Drinker and Hatch's "Industrial Dust" from '36?

3 A When that -- yes. When that came out, we -- we had a

4 copy. I'm -- I'm sure that I read it from cover to cover,

5 but I don't recall anything about it.

6 Q Okay. I'm thinking that the first edition was 1936.

7 A That could be. That was not the edition that I read.

8 It was a later edition.

9 Q How about the text "Silicosis and Asbestosis" by Lanza

10 from right before the war?

11 A I don't think so.

12 Q You don't remember seeing that one?

13 A No, I don't.

14 Q In any event, you don't have any of these in your
15 personal library now, do you?

16 A I do not.

17 Q Do you recall any time when it was the practice at Dow
18 to use contractors to do the dustier work in the plants,
19 sir?

20 A We had contractors in the plant, but they weren't hired
21 to do the dustier work. They were hired to do work that
22 just didn't fit into the work schedule of the crews that we
23 had around.

24 For instance, I recall one circumstance where a carbon
25 tetrachloride producing plant was torn down. We didn't have

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1 people that did that kind of work. So, a contractor came in
2 and did it.

3 So, there were -- there were lots of things that
4 contractors did, but it wasn't simply because the work was
5 dusty. It was because that was what contractors did.

6 Q Do you recollect that Dow had insulators among its
7 employees or that Dow had employees who did insulation work?

8 A I have no such recollection. It could be. It could
9 not be. I just don't know.

10 Q All right. Do you understand that Dow was one of the
11 first US companies that actually had its own toxicology
12 laboratory and tox department?

13 A Yes. This is true.
14 Q Can you tell us what the other early ones would have
15 been?
16 A DuPont certainly established the Haskell Lab around the
17 same time that Dow did. I know that others followed. I
18 know that Monsanto didn't. I think Carbide had a group
19 doing some work, but I wasn't very familiar with their
20 toxicology group and when it started and so forth.
21 Q I think that the testimony we've had from others was
22 that Carbide was relying on an outside lab in the Pittsburgh
23 area for special projects maybe run by a Dr. Henry Smith?
24 A In fact, that's right. The Mellon Institute Lab,
25 that's correct.

9

1 Q Back to contractors a second. Did the Dow industrial
2 hygiene program that you worked in, '53 to '65, concern
3 itself with contractors in the Dow plants?
4 A Sure.
5 Q And as a practical matter, what did that amount to, in
6 general terms?
7 A I recall and I told you about this demolition of the
8 carbon tet plant that took place. I was assigned to go
9 visit the demolition site and to make sure that people were
10 not doing things in variance with the Dow policy.
11 Before going out into the site and wandering around and
12 watching people work, I talked with the contractors as a
13 group; and, basically, I wanted to warn them that they were
14 likely to encounter some hydrogen sulfide in the plant.
15 They knew far more about hydrogen sulfide than I did. So, I

16 learned more about the acute effects of hydrogen sulfide
17 from those people; and they impressed me sufficiently that I
18 didn't bother them about it. They knew what they were
19 doing.

20 Q And did I understand from the things you said that Dow
21 was also requiring the contractors to, basically, follow the
22 same safety and safety rules as the Dow employees did?

23 A Yes, that's correct.

24 Q And would I be right that the safety department at Dow
25 would have been the ones to, generally, to -- to enforce

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1 that requirement?

2 A That's correct.

3 Q Would you recollect any occasions when you had to go do
4 any sampling of work areas for contractors or not?

5 A I don't recall, specifically, any air sampling that I
6 did where contractors were working; but I did an awful lot
7 of air sampling in some that could well have been under such
8 circumstances. It was nothing special at the time. So, I
9 didn't worry about it.

10 Q You did mention one of your projects being concerned
11 with ventilation and vent hoods that you observed while you
12 were doing your plant inventory. Do you recollect that you
13 encountered any exhaust ventilation in fabricating shops
14 where thermal insulation was being handled with that?

15 A No. I don't recall any fabricating shops. Let's put
16 it that way.

17 Q Okay. It may have been there, maybe not, maybe you had
18 ventilation, maybe you didn't?

19 A Yes. I don't recall a fabrication shop there. I
20 recall other fabrication shops but not Dow.
21 Q Okay. Well, as a general proposition, based on the
22 state-of-the-art in the 19 -- early 1950's, would the use of
23 mechanical ventilation in an insulation fabricating shop be
24 a not only sensible but probably necessary engineering
25 control for dust?

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1 A Sure. Absolutely. I mean, this is mentioned in the
2 Fleischer and Drinker paper that the Navy people spent a lot
3 of time, effort, and energy trying to devise ways of
4 handling these materials safely; and I don't see any reason
5 why others couldn't have done so, too.

6 Q And, in fact, ventilation of this sort was one of the
7 controls that was used in these shipyard insulation shops,
8 right?

9 A Yes.

10 Q Am I right in thinking, Dr. Peterson, that this
11 principle of ventilation was not something newly discovered
12 in the '50s or the '40s?

13 A That's correct.

14 Q Okay. So, even if we go back to the '30s or the '20s,
15 I mean, the machines may have differed; but the principle
16 was well-known to industrial hygienists?

17 A You can go back centuries, if you wish.

18 Q All right, sir. Do you recollect that the shipyard
19 workers that Mr. Fleischer and Drinker and others reported
20 on in 1946 also had the benefit of other engineering
21 controls like wet methods and --

22 A Yes.

23 Q -- good housekeeping procedures?

24 A These are all accepted standard procedures in
25 industrial hygiene and have been since way before I got in

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1 the field.

2 Q Well, while we are here on this stop along the way,
3 then, would you tick off for me the general principles that
4 would be applicable to dust control that have been
5 well-known in your field back through the early part of this
6 century?

7 A Okay. Once upon a time, I wrote a chapter in the NIOSH
8 instruction manual about controlling hazards in the
9 occupational environment. You will find that in my CV.
10 But, basically, one controls hazards from materials that one
11 can inhale by -- oh, I'm not even going to try and count
12 them all offhand.

13 One either isolates the process or one isolates the
14 workman or one changes the materials or the process that is
15 being used or one uses wet methods to suppress dust. The
16 isolation process can be very complex or very simple. You
17 can isolate with time, distance, or mechanical barriers
18 around the workmen or around the process.

19 This -- this stuff is not new. It's been used in some
20 form or another since there were people working with
21 hazardous materials with greater success as time went on.
22 We know more today than we did a long time ago.

23 Q A lot of this has to do just with good housekeeping, as
24 well, in the worksite, doesn't it?

25 A Oh, yes. That's correct.

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1 Q And I suppose if we are talking about, let's say,
2 thermal insulation, for example, just the way you handle the
3 material, physically handle it in cutting it and installing
4 it and removing it can have some effect on the amount of
5 dust that might be generated?

6 A There is no question about that.

7 Q And what happens with the refuse as it is put on the
8 ground or falls to the ground and how frequently that's
9 cleaned up can bear on the amount of dust put into the
10 environment, as well, doesn't it?

11 A Certainly.

12 Q And that, too, was a principal that Fleischer and
13 Drinker espoused in the shipyard program?

14 A They did.

15 Q And am I right in remembering that there was, also, a
16 medical monitoring program that went along with this
17 shipyard insulation?

18 A Yes.

19 Q And all of these principles you have been discussing in
20 the last couple of minutes were ones that Drinker and others
21 laid out early on in the war when they proposed regulations
22 for the Navy shipyard shipbuilding programs, right?

23 A Yes.

24 Q And covered not only asbestos but silica and welding
25 fumes, for example?

1 A Just about anything that people could get into.

2 Q All right. So, looking back, we could say that the --
3 while the machines and the tools and the technology today
4 has advanced to some degree or another, the basic principles
5 of industrial hygiene really haven't changed much over your
6 lifetime, not just your work lifetime but your lifetime, as
7 well?

8 A That's right. The same philosophy has pertained all
9 the way along.

10 Q One thing we forgot to mention in this series that you
11 were setting out for us was protective equipment,
12 respirators. I guess that would be a way of isolating the
13 workmen themselves. So, that would be an example --

14 A Yes.

15 Q -- of isolating the workmen?

16 A In fact, that's the best example is the use of
17 protective gear of all kinds by the workmen, whether it's
18 boots and gloves or a respirator or whatever that one wears,
19 an apron, so forth.

20 Q And I guess that's the reason why in a lot of
21 industries and even back to the turn of the century the
22 workmen would have factory garb to wear at work to where
23 they wouldn't actually be wearing their street clothes in
24 their job with dust and chemicals?

25 A That certainly has pertained all the way along as a way

1 of protecting the workmen, yes.

2 Q And by the same token, a way of preventing that dust or
3 hazardous liquids not be carried home on the workman's
4 person to his household, as well, right?

5 A Yeah. Where that could be a problem and the problem
6 was recognized, that was a reason for using different gear,
7 clothing, and so forth at work, to not carry it home. We
8 did that a lot in the formulation of insecticides. We had
9 the people that worked in the insecticides wear
10 company-supplied clothing of all kinds so they wouldn't
11 carry the stuff home with them.

12 Q Do you have any clear recollection of the nature of the
13 Dow respirator program while you worked there?

14 A We didn't have a respirator program, per se. The
15 industrial hygiene group or the safety people usually would
16 make recommendations about respirators. The industrial
17 hygiene crew was mostly interested in making sure that if
18 people were using respirators they were using the proper
19 respirators.

20 The only group that I'm aware of that routinely used
21 respirators were those people running the chlorine cells and
22 they had the so-called sucker respirators for chlorine that
23 they wore around their necks until they smelled some
24 chlorine. And then, they put the nose clip on and stuck the
25 respirator in their mouth and went on working. This became

9

1 a very controversial thing at one point; but at any rate,
2 that's the only group that I recall that routinely used
3 respirators.

4 Q Did you ever have occasion to do any work out at the

5 Colorado facility that Dow was running for the ADC?

6 A No. I almost got there once, but the problem that I
7 was to go out on apparently got solved. And so, they didn't
8 go ahead and get my Q clearance that would have been
9 required.

10 Q I'm sure you and your colleagues must have appreciated
11 that there were problems getting a good fit of respirators
12 on your workmen back in the '50s?

13 A That would have been the case if we had very many
14 people using fitted respirators, but the sucker respirator
15 you stick in your mouth. It's a piece of tubing, and there
16 is no fit there. So that those respirators required no fit,
17 and we didn't have a problem with the fit.

18 Q But on a half-face, mechanical, filter-type respirator,
19 fit is an issue, isn't it?

20 A It certainly is.

21 Q You might remember one of the Dow hygienists out at the
22 Colorado facility -- what is it? Rushing Flats? Rocky
23 Flats?

24 A Rocky Flats.

25 Q Rocky Flats. -- actually developed a fit-testing

10

1 program for respirators probably around the time you left
2 Dow.

3 A I think it was about that time. We were aware that not
4 all respirators fit all people. I mean, any idiot can be
5 aware of that. And, therefore, even attorneys might be
6 aware of it. You never can tell.

7 At any rate, we at the safety department always had

8 respirators available that had been made by very many
9 manufacturers so that one could obtain a good fit if you
10 tried.

11 Q Okay. I mean, it was the case that no single
12 respirator would fit every person in the group?

13 A That's true.

14 Q And probably no person in the group could get a fit
15 with every single respirator in your inventory?

16 A One would expect that to be the case, as well.

17 Q Very briefly, on medical monitoring at Dow, is this an
18 area that you can help us with for that period the early
19 '50s to mid '60s?

20 A Very peripherally, yes. I was aware of medical
21 monitoring programs that I requested; but other than that, I
22 wasn't aware of the details of the medical monitoring done
23 by the medical people.

24 Q There was enough staff to do medical monitoring at Dow
25 in the early '50s, I assume?

10

1 A Yes, there was.

2 Q I think you told us before that periodic physical
3 examinations were available for any individual who requested
4 one?

5 A Yes. I think that's my recollection of Dow policy.

6 Q Do you recollect that physical examinations were
7 regularly required for any particular trade or craft?

8 A Not a trade or craft. Instead, it was as a result of
9 potential exposures, particularly as Dow got into the
10 cholinesterase-inhibiting insecticide business. Then, we

11 had periodic monitoring of plasma and red cell
12 cholinesterase levels in the people who were so potentially
13 exposed. That's one that I had something to do with. So, I
14 know about it.

15 I know that other medical monitoring was done; but
16 where and under what circumstances, I don't know.

17 Q Okay. Were you aware that at least by the time of
18 World War II that Standard Oil, now Exxon, had a medical
19 monitoring program for its workers potentially exposed to
20 asbestos?

21 A No. I was not aware of that.

22 Q Do you know if there was any regular program at Dow for
23 having chest films made of people who would be potentially
24 exposed to dust in the workplace?

25 A I'm not aware of that.

10

1 Q Was there any kind of biological monitoring program at
2 Dow, other than for the cholinesterase-exposed workers?

3 A Once Dick Stewart started working with Dow as a
4 physician in the medical department, he started using breath
5 monitoring or breath analysis as a technique for monitoring
6 exposures to various solvents. I helped Dick do some of the
7 basic research that lead to being able to do that. But
8 that's the only biological monitoring that I'm aware of,
9 unless urine analysis was used where trichloroacetic acid or
10 trichloroethanol would be expected as a result of exposures
11 to trichloroethylene or perchloroethylene or something of
12 that sort.

13 Q So, you would take a chemical analysis of a person's

14 exhalation to look for solvent exposures? Is that what I
15 understood?

16 A Yes. That's correct. Look for the concentration of
17 solvent in the exhaled air, yes.

18 Q I see. Okay. Do you know if pulmonary function
19 testing was done at the Dow plant in Midland?

20 A I don't recall.

21 Q You never had one there, anyway?

22 A No, I never did.

23 Q When we visited before, you said something to me to the
24 effect that the 5 million particle TLV for asbestos was
25 based on the wrong kind of sampling method. Do you remember

10

1 that?

2 A Sure.

3 Q Could you explain to me what you meant by that?

4 A Well, it turned out as a result of subsequent research
5 that it's the fibers of asbestos that cause injury. Whereas
6 the midget impinger sampling and counting methods, you can't
7 separate one from the other except physically. I was
8 looking at all particles, and it isn't the rounded particles
9 that cause any injury at all. It's the fibers. So, in that
10 respect, we were looking at the wrong thing so far as the
11 sampling method is concerned because the midget impinger is
12 a pretty rotten sampler for fibers; and we were looking at
13 the wrong counting method because we were looking at all
14 particles and not just fibers.

15 The subsequent research, some of which was done at
16 Saranac Lake by the people there, showed that it's fibers

17 that count in this business; and the British taught us to
18 use the membrane filter method for analyzing air and
19 counting fibers.

20 Q Are you -- was it the case, then, of when the -- what
21 became the TLV or what was originally called the maximum
22 allowable concentration for asbestos was developed that
23 these particles were counted, basically, as a surrogate for
24 the potentially harmful material in the dust?

25 A Not as a surrogate. The people who were doing this

10

1 thought that it was all the particles that caused the
2 injury. They had no appreciation for the fact that injury
3 was caused only by fibers.

4 Q Well, were they able to count fibers back in the late
5 '30s when this TLV was proposed?

6 A Sure. Read the Dreessen report, and you will find some
7 fiber counts in it. Nevertheless, subsequent research has
8 shown that the midget impinger is a pretty crummy sampling
9 method for fibers. It is much better for nonfibrous
10 particles than it is for fibers. We didn't know that then.

11 Q Okay. You are saying back then, though, when Dreessen
12 did his studies that he had the technical capability, the
13 equipment that would let him see and count fibers?

14 A Yes, but not to sample fibers. He didn't have the
15 technical equipment that would allow him to sample and then
16 count only fibers. We didn't have the membrane filter,
17 which is what is necessary to do that.

18 Q Okay. Let me make sure I understand. You say he
19 didn't have the capability to sample and count fibers?

20 A (Witness nodding head affirmatively.)
21 Q So, what was your reference to Dreessen's report about
22 fibers, then? You threw me there.
23 A Oh, there is a table - I don't remember the table
24 number. There are a lot of tables in that report - where he
25 talks about the percentage of fibers amongst the particles

10

1 that were counted in some areas. So that, sure, with a
2 light-field microscope and midget impinger sampler you can
3 see fibers, no question about it, if you are exposed to
4 asbestos.
5 You can't see very many of the fibers that actually
6 were present in the air that was sampled, however, because
7 the sampling method is inefficient for fibers. Just because
8 it's inefficient, however, doesn't mean that it didn't find
9 any. Sure, it found fibers.
10 Q Okay. And so, with the -- with the sample, you get
11 some of them -- some fibers, if you were dealing with air,
12 that had asbestos in it and you could see and count some
13 fibers with the light-field microscope but you would be
14 undercounting what was really there. Is that --
15 A That's correct.
16 Q -- what you are telling me?
17 A You wouldn't be undercounting. You would be counting
18 all the fibers you could see. So that's not undercounting.
19 That's undersampling, if you would. We are missing a lot of
20 the fibers when using the midget impinger to sample air.
21 Q But, nevertheless, the TLV that came to be developed in
22 roughly -- when was this? Tell us. '46, did you say?

23 A '38 was the Dreessen report. The first TLV was '46.

24 Q Okay. And as we saw in something we were looking at

25 after lunch, that's also been called a MAC, maximum

10

1 allowable concentration.

2 A It was called the MAC when it was first developed.

3 They didn't start using the phrase "threshold limit value"

4 until the late '50s or early '60s.

5 Q Okay. But the -- then, this standard for maximum

6 allowable concentrations that you said first was published

7 in '46 was, nevertheless, based on samples taken with a

8 midget impinger and counts made with the light-field

9 microscopy to determine the number of particles per cubic

10 foot?

11 A That's right. That's a very short summary of the

12 process. There is a lot more that goes into it, but that's

13 fine.

14 Q Okay. And the method on which the asbestos standard

15 was based didn't change until when? Sometime in the late

16 '60s?

17 A About 1974.

18 Q And the standard itself, the 5 million particles per

19 cubic foot for asbestos, when did that change?

20 A Well, it began to be changed in 1968. The change did

21 not take place fully until the '70s. I think it was '74.

22 It might have been '72. I don't remember for sure.

23 Q Well, in 1968, I think at Dow the -- your department

24 was preparing to move to a lower number, like a 2 million

25 particle standard, if I remember correctly?

1 A That's probably correct. I wasn't there.

2 Q Yes, sir. But am I right, then, that it wasn't until
3 sometime in the early 1970's that the 2 million particles
4 per cubic foot standard for asbestos took the place of the
5 5 million particle standard?

6 A The 2 million particle standard never took the place of
7 the 5 million particle standard. It was proposed in 1968
8 that the standard be changed to either 2 million particles
9 per cubic foot or 12 fibers per CC. After 1968, we only had
10 proposed standards until 1974, when the standard that was
11 adopted was 5 fibers per CC.

12 Q So, in terms of the ACGIH standard recommendation, it
13 went from being 5 million particles per cubic foot to 5
14 fibers per CC in one jump, with --

15 A Yes.

16 Q -- proposed changes in between that never took --
17 really became the standard?

18 A Yes. That's correct. That is the way it went.

19 Q Okay. And I know that they don't exactly equate to
20 each other, but what is the -- what multiple of five fibers
21 per CC is the 5 million particles per cubic foot?

22 A Well, the way one looks at that is to say, okay, maybe
23 ACGIH and OSHA and so forth knew what they were talking
24 about and that 2 million particles per cubic foot was
25 equivalence to 12 fibers per CC, maybe. Actually, earlier

1 work and subsequent work has shown that that kind of
2 equivalent would only apply to one circumstance, at best.

3 So that it's a wild, hairy ass guess, really.

4 Q Okay. But is there a --

5 A That's the way it is.

6 Q Is there a relation between the five fibers per CC to
7 -- relative to 5 million particles per cubic foot, or are
8 they just not comparable?

9 A No. You have got -- no. They aren't really
10 comparable. However, if 2 million particles per cubic foot
11 is equivalent to 12 fibers per CC, that means that we've got
12 a factor of six between the two. And so that six fibers per
13 CC -- no. I'm sorry.

14 Q Equal 1 million particles per cubic foot.

15 A Something like that.

16 Q Yeah. Okay. Now, it's -- it's often said, I think,
17 that the ACGIH reviews these standards every year and they
18 publish in perhaps not yearly but every few years their
19 TLV's but the truth is that there wasn't any serious review
20 of the asbestos standard by the ACGIH between 1946 and 1966,
21 was there?

22 A There may well have been. The fact of the matter is,
23 we didn't have any publications that they could refer to
24 that would mandate the change in anything. So that whether
25 the standard was reviewed annually, as ACGIH says it is, I

10

1 really can't say because I wasn't there.

2 Q Okay. So, there may have been. There may not have

3 been. You don't know?
4 A That's correct.
5 Q When you began to work on the ACGIH committees in --
6 after 1965 --
7 A (Witness shaking head negatively.)
8 Q You didn't?
9 A Your predicate is wrong. I never worked on an ACGIH
10 committee.
11 Q Well, you probably should have.
12 A That could be.
13 Q Okay. You never worked on an ACGIH TLV committee at
14 all?
15 A Of any kind of committee for ACGIH.
16 Q Well, then, I'll leave that alone; and we'll move on.
17 A Thank you.
18 Q Do you know of any products that Dow made that had
19 asbestos in them?
20 A No, I don't.
21 Q Did Dow make a stop leak or antifreeze product?
22 A Dow made an ethylene glycol antifreeze; but it was
23 never sold under a Dow label, as far as I am concerned.
24 They may have supplied ethylene glycol as an antifreeze
25 formulation to others. Wait a minute. There was a Dow

11

1 product that was based upon distilled or deionized water,
2 and it wasn't an added product. They would replace the
3 coolant in a vehicle's engine with this coolant based on
4 very, very pure water and pure ethylene glycol; and it
5 wouldn't corrode anything in the system. And it may have

6 had corrosion inhibitors in it, so far as I know; but I
7 don't think there was any asbestos in it.
8 Q Okay. Dow made an ethylene glycol product which you
9 think it sold to someone else for packaging and --
10 A Oh, I'm sure of that. Sure.
11 Q -- and retail?
12 A Yes. Ethylene glycol was one of Dow's big products,
13 and it sold it to all sorts of people, all sorts of other
14 chemical companies.
15 Q Yes, sir. But Dow never sold under its own label at
16 retail, so far as you know?
17 A Just that one I'm talking about. I think that was sold
18 under the Dow name, but I'm not even positive of that.
19 Q Okay. You don't know if Dow used asbestos in its
20 ethylene glycol formulation?
21 A I don't know why they would; but, no, I'm not aware of
22 how they formulated the ethylene glycol that was sold. To
23 the best of my knowledge, what Dow sold was pure ethylene
24 glycol.
25 Q Okay.

11

1 A Other people might have used it and mixed it with all
2 sorts of things.
3 Q While you were a Dow industrial hygienist, do you
4 remember seeing insulators at work in the plants?
5 A Never.
6 Q And you have already told us you don't know if or what,
7 if at all, asbestos insulation materials were used in Dow
8 plants?

9 A That's correct.

10 Q Whose they were, if they were, --

11 A That's right. I just --

12 Q -- or how they were?

13 A I know nothing about it. Even less than that. We get

14 into negative numbers.

15 Q Did you Dow industrial hygienists do work for other

16 companies while you were there, sir?

17 A In one respect and only one that I am aware of and that

18 is one of Dow's big products was Styrofoam. Styrofoam was

19 polystyrene blown with methylene chloride. So, all the

20 little bubbles -- not methylene. Methyl chloride. All the

21 little bubbles had methyl chloride, and a lot of this stuff

22 was fabricated by Dow customers by sawing it up. And when

23 you saw these little bubbles, methyl chloride was released;

24 and Dow was scared silly this was going to hurt somebody.

25 So, they had a deal with their customers that any time

11

1 Dow wanted to, Dow could come into the customer's plant and

2 monitor for methyl chloride concentrations where the

3 Styrofoam was being cut up.

4 I had nothing directly to do with that program. That

5 was Ed Schneider's program, and he ran all over the country

6 doing this periodically. But with that program, no Dow

7 customer was ever injured by methyl chloride, to the best of

8 my knowledge.

9 Q This is a form of a products stewardship program, you

10 might say, correct?

11 A Yes.

12 Q Did you Dow hygienists do any work for Dow Corning
13 along the way?

14 A Very occasionally. I think one of us would go over
15 there on an emergency basis of one kind or another. I
16 recall going over to Dow Corning once, I believe. I think
17 Larry Silverstein went over a couple of times while I was
18 there, and that was the extent of it.

19 Q Do you recall ever seeing people sandblasting in the
20 Dow plants?

21 A As I said, I may have monitored the -- or sampled the
22 silica exposures of a sandblaster at Dow; but beyond saying
23 that that may have happened, I can't answer the question any
24 better than that. I just don't know.

25 Q Okay. How many plants were you responsible for or how

11

1 many plants did you have to cover while you were a Dow
2 hygienist?

3 A Well, most of my work was done in Midland, in the
4 Midland division. Most of the work in outlying plants,
5 outlying divisions of the company was done by Mr. Hoyle. It
6 was only if Harold were unavailable or for some other reason
7 that one of us went to the other plants.

8 I actually got to Freeport, Texas, twice, I believe. I
9 got to Sarnia, Ontario, once or twice; over in Bay City once
10 or twice; to Ludington, Michigan, once; and I think that is
11 it. I don't think I did any other work elsewhere.

12 Q Okay. During your plant talks, slide talks, you called
13 them, to the workers, while you were at Dow was asbestos
14 ever discussed in those slide talks --

15 A I don't recall --
16 Q -- with the workers?
17 A -- ever doing so. I don't recall any plant where
18 asbestos was handled in Midland.
19 Q Were there meetings between industrial hygiene persons
20 and union representatives in the Dow facilities while you
21 were there?
22 A Sure.
23 Q Did you participate in any of those?
24 A No. Mr. Hoyle did that kind of work.
25 Q Do you know whether or not such meetings had records

11

1 made to show what was discussed?
2 A I don't know. Let me back up a little bit. Whenever
3 we went out to give a slide talk, we would have as many
4 people as the plant could spare for production in our slide
5 talks; and we almost always had union representatives in
6 that group. So that I met a lot of union reps but not on a
7 formal basis. I believe Harold did eventually, but that's
8 simply a belief. I don't know that from seeing it or being
9 told about it directly.
10 Q In addition to the slide talks, were there other
11 methods you used at Dow to inform your workers of
12 occupational disease hazards they might face in the plants?
13 A Not directly that I recall, no. That was the main one
14 until we developed our data sheets; and then, they became
15 available to everyone in the plant.
16 Q And you place the data sheets in what period, sir?
17 A You just found the publication. Was it '61? At any

18 rate, it was before that. It was probably '59, '60,
19 something in that neighborhood.

20 Q And data sheets being, let's say, a forerunner of the
21 material safety data sheets we speak of today?

22 A Yes, they were. In fact, I think they are better than
23 the MSDS's of today. They generally are.

24 Q Prior to 1965, when you left Dow to go back to the
25 university, are you aware of any efforts at Dow to warn or

11

1 instruct people, workers potentially exposed to asbestos
2 about the health hazards that they might face?

3 A No.

4 Q Would you say that in 1965, at the time you left Dow,
5 that you and your colleagues knew what a no effect exposure
6 level for asbestos was?

7 A We would take the no effect level as being at the TLV.
8 All of us were. And at that time, in 1965, it was 5 million
9 particles per cubic foot.

10 Q That seems to be a little bit at odds with your
11 statement to me earlier that you also recognized in the '50s
12 and '60s that it was possible to -- for a person exposed at
13 levels below the TLV to develop disease?

14 A Oh, I know that now. At that time, I didn't know it.
15 No way. Unless we look at the TLV's in a philosophical
16 fashion to realize that a threshold limit value is not an
17 absolute line between safe and dangerous, that you can be
18 exposed to above a TLV and perhaps not suffer any injury.
19 You can be exposed below it and perhaps suffer some injury.
20 But these are perhapses. And so far as a line exists, the

21 line is the TLV at any particular time, for me and for most
22 industrial hygienists.
23 Q So, you're recalling that in the '50s and '60s you
24 treated the TLV as a bright line between a safe and a
25 possibly harmful level of exposure?

11

1 A In so many words, yes.
2 Q Okay.
3 A However, all of us, certainly at Dow and most
4 industrial hygienists I know of, did their best to make sure
5 that exposures would never exceed the TLV and would be kept
6 as low below the TLV as practical.
7 Q And why would you want to keep exposures as low as
8 practical?
9 A Simply because of the very faint possibility of injury
10 and because of the idea that we didn't want people exposed
11 to things where an exposure was not a necessary part of what
12 they were doing.
13 Q And would I be right in thinking that even in the mid
14 '50s you would have recognized that there was a wide
15 variation in individual susceptibility to different
16 stressors that you might have in the workplace?
17 A I think that's been known as long as people have
18 thought about such things.
19 Q And in your teaching and studying in the health science
20 area, you certainly would have learned or known that even in
21 major epidemics not everyone falls prey to the virus or the
22 bacteria or the disease; isn't that true?
23 A That's true.

24 Q Well, was it the practice at Dow to err on the side of
25 caution when dealing with TLV's for harmful materials or

11

1 just to run right up to the line?

2 A We tried to be safe always. We tried to err on the
3 side of caution, not on the side of possibly overexposing
4 people. That was our aim always.

5 Q And did you think that was the only reasonable approach
6 to take to protecting the workers from hazards and chemical
7 hazards and --

8 A Sure. I can't think of any report that I have written
9 where I didn't say, "Okay. This exposure is safe. It's
10 okay to have. However, if you do this, you can reduce the
11 exposure." I think we all do that. We all adopt that
12 philosophy on just a part of industrial hygiene. I'm not
13 simply saying this is Dow people. I think it's every
14 industrial hygienist I know will do that.

15 Q Or ought to do that?

16 A Most of them do do it. They say if the exposure is
17 okay, if you go over the TLV, they will still point out ways
18 you can reduce the exposure. I think this is a very logical
19 part of industrial hygiene.

20 MR. BLANKS: A short stop, Art?

21 MR. ALMQUIST: Yes. You read my mind.

22 (After the break, the proceedings continued as
23 follows:)

24 Q (By Mr. Blanks) All right. We were talking about
25 keeping those exposures as low as possible when we broke

1 and --

2 A As low as practical.

3 Q As practical. With as low as possible being the goal
4 and as low as practical being the practical effect and I
5 mean --

6 A Joe, one time somebody sat down and calculated that
7 each breath we take contains 200 molecules of air that went
8 through the lungs of Cleopatra. You can never get things as
9 low as possible. All you can do is stay within the realm of
10 practicality.

11 Q All right. And that was certainly the goal of the
12 industrial hygiene program at Dow while you worked there,
13 right?

14 A It was.

15 Q Now, do you know by the time you left if there was some
16 kind of a database kept at Dow on the death certificates of
17 annuitants and employees that would give them a basis for an
18 epistudy?

19 A I would be surprised if that weren't the case, but I
20 sure don't know from my own knowledge.

21 Q Okay.

22 A Gee, the way you are paging through those things, we
23 don't have much to go.

24 Q Well, just about half the pile; and we are doing good.

25 A Okay.

1 Q I noticed on your CV you had listed some representative
2 clients, and you noted Monsanto as one of them. Could you
3 just tell me what sort of projects you have done for
4 Monsanto?

5 A Good question. Monsanto has a plant in Charleston,
6 West Virginia, and they were having some problems and
7 contacted me as a consultant to come down and help them
8 solve their problems and I did.

9 Q In the plant?

10 A In the plant.

11 Q It had nothing to do with litigation?

12 A No. That's right. Not at that time. I did some other
13 work for Monsanto that had something to do with litigation;
14 but it was preparing a book, if you will, that was to be
15 used to educate attorneys on the issues surrounding dioxin
16 exposures and their consequences.

17 Q Per chance in connection with the agent orange
18 litigation?

19 A Yes.

20 Q So, when you went to the Charleston plant, you were
21 there just as an outside industrial hygiene consultant to
22 provide expertise for a particular issue that had come up at
23 the plant?

24 A Yes.

25 Q There were folks that were available to do just that

12

1 sort of thing, that is, consult on industrial hygiene
2 questions back even in the early 1950's, were there not?

3 A Let me back up. Maybe that wasn't for Monsanto. That

4 was for FMC that I did this. What did I do for Monsanto
5 except that book? I don't remember right offhand.
6 Q Well, okay. Let me go back to the question I put to
7 you. Whether it was Monsanto or FMC or Dow or anybody else,
8 Stouffer Chemical, you came in as an outside consultant to
9 offer your expertise in solving a problem or a perceived
10 problem?
11 A Yes, I did.
12 Q To make recommendations for --
13 A Whatever.
14 Q -- controls and preventive measures, whatever might be
15 appropriate?
16 A Yes.
17 Q Now, my question, then, was: Weren't there people,
18 industrial hygienists, available to do that kind of
19 consulting work for companies even back in the 1950's?
20 A Probably. I certainly don't know anybody who was a
21 consultant in industrial hygiene in the '50s, but I would be
22 surprised if there weren't such people. I just don't know
23 who they would be.
24 Q But did you ever come to learn that, for instance, the
25 Industrial Hygiene Foundation would do surveys on request?

12

1 A For their members, --
2 Q Yes.
3 A -- yes; but not just on a general basis.
4 Q And did you ever learn that Phil Drinker and others
5 from the Harvard Public Health School were available to do
6 consulting with private industry?

7 A No.

8 Q Will you be surprised to learn that that occurred?

9 A No, not at all. I just didn't happen to know it.

10 That's all.

11 Q Okay. And this wasn't a problem at Dow because you had

12 your own industrial hygiene department, at least by the time

13 that Mr. Hoyle was hired?

14 A That's right.

15 Q Do you recall seeing any material data sheets or safety

16 data sheets before you left Dow that dealt with

17 asbestos-containing insulation materials?

18 A No.

19 Q If these had come to Dow for its use, would it have

20 come into your department?

21 A Yes.

22 Q Would you think that by 1960, for example, that at Dow

23 you would have needed to be told by an insulation supplier

24 about the potential health hazards of asbestos in its

25 insulation?

12

1 A No.

2 Q How about in 1955, when you had had a couple of years

3 experience?

4 A Same answer.

5 Q You wouldn't have needed the asbestos companies to tell

6 you that there were health hazards associated with certain

7 levels of exposure to their product?

8 A No.

9 Q Has your welding rod work or your welding fume work

10 been focused on the manganese issue exclusively?

11 A No. When we first had lawsuits regarding welding rods,
12 they were focused on asbestos that was used in the coatings
13 of some electrodes.

14 Q And what conclusions or opinions did you express about
15 any asbestos hazard connected with the welding rod coatings
16 and fumes?

17 A That there was none.

18 Q What did you base that on?

19 A Two things: One, that asbestos is completely destroyed
20 when it hits the arc and the first contentions were that
21 people were breathing asbestos that appeared in welding fume
22 and this simply cannot be.

23 The second contention was that people got exposed to
24 asbestos from the coatings when they bent the welding rods.

25 A welder will maybe bend a welding rod once or twice in his

12

1 lifetime, but it isn't likely to happen much more often than
2 that.

3 And on that basis, I said I don't believe that there is
4 any hazard whatsoever from asbestos and welding rod fumes.

5 Q Okay. Nobody ever suggested to you that it was
6 customary to take a rod and crush it to roll or crush the
7 coating so you could use the rod for a filler?

8 A Sure. That was done; but not a filler, really. A
9 spacer is what they usually used the doggone things for, and
10 that wasn't very often. I have never talked to a welder who
11 did much of that. I have talked to a lot of welders.

12 Q It must have been better welders than me, then.

13 A That could be. I wouldn't know.
14 Q Okay. Stouffer, do you know what kind of work you did
15 for them, Stouffer Chemical?
16 A It was in conjunction with the coating of plastic films
17 with paint one way or the other, whether it was paint or ink
18 or whatever that they were doing at some plant or another,
19 that I came in and did a walk-through inspection and told
20 them how they should handle this so their people wouldn't be
21 overexposed to the chromates in that.
22 Q How about your work for GMC, Ford, and Chrysler, sir?
23 What did that involve?
24 A Several things. The very first consulting I ever did
25 was for GMC in a case litigation in Colorado which involved

12

1 carbon monoxide. Did I ever do anything else for GMC? I
2 don't recall.
3 International Harvester, did you list that?
4 MR. ALMQUIST: Forgot that one.
5 A That was carbon monoxide cases, as well.
6 Q (By Mr. Blanks) How about GM -- I'm sorry, Ford and
7 Chrysler?
8 A Ford was some sort of litigation. Chrysler was not --
9 well, it was workers' comp where a guy was -- well, there
10 were two or three workers' comp cases that I got involved
11 in.
12 Q Involving exposures at work?
13 A Yeah, that's right.
14 Q Not involving asbestos, silica, benzene?
15 A No, none of those materials.

16 Q Did you ever do any brake shoe cases for the automotive
17 companies?

18 A No. I have evaluated exposures from working with brake
19 shoes, but I have never done anything for the companies.

20 Q Ever done any litigation work in the asbestos brakes
21 material area?

22 A Once upon a time, I was shipped a lot of information, a
23 lot of papers regarding brake shoes and asbestos in a case
24 or cases in Orange County. This is when I was still in
25 Wisconsin, but it never went beyond that. It never even

12

1 went to deposition. So, I don't know what happened with the
2 cases or anything else; but that's the only time I have
3 gotten involved in that at all.

4 Q You told me last time we chatted that you had had some
5 dealings with a Jon Konzen a Konzen of --

6 A Yes.

7 Q -- OCF. Could you tell me about that?

8 A Jon was at the University of Michigan working on his
9 Master of Public Health. At the same time, I was at the
10 University of Michigan working on my Ph.D. So, I met Jon at
11 that time. I, to the best of my knowledge, haven't seen him
12 since.

13 Q Was he an Owens-Corning Fiberglass employee at the time
14 he was working on his postgraduate degree?

15 A I have no idea. He was a physician, but I don't know
16 who sent him there. It could have been OCF. I just don't
17 know.

18 Q Well, I was just curious. If you haven't seen him

19 since then, how do you -- is it you associate him with OCF?
20 A Oh, I have seen his name on some papers where he is
21 identified as an OCF medical director; and it's a peculiar
22 name. It's J-o-n rather than J-o-h-n, and Konzen is a
23 peculiar name. So, it stuck in my mind. I doubt if I could
24 pick him out of a group of people; but, nevertheless, I have
25 met him, I do know him, and I respected him.

12

1 Q Do you understand he is still living?
2 A Yes.
3 Q Do you know where, more or less?
4 A I have no idea.
5 Q How about Ms. Cathy Johnson?
6 A Cathy is a gal that I worked with in producing that
7 book for the Monsanto attorneys. She, at that time, was not
8 working for OCF. She left OCF and -- or whatever. She
9 wasn't working for OCF, anyway. She was an independent
10 consultant. She may have gone to OCF since then. I am not
11 even sure of that. I don't see Cathy very often, either.
12 Q What was her area of expertise?
13 A In industrial hygienist.
14 Q And where did you last believe her to be living or
15 working?
16 A In Ohio, northern Ohio somewhere.
17 Q Do you know that -- whether or not she is a member of
18 your association?
19 A Well, I belong to three associations, in fact, several
20 associations.
21 Q Well, I mean --

22 A She is probably a member of the AIHA. Beyond that, I
23 don't know.

24 Q And your dealings with Mr. Hazard, we mentioned him a
25 little earlier today, but that was limited to contacts at

12

1 professional society meetings?

2 A Yes, that's correct.

3 Q You never had occasion to call on him for any
4 information or vice versa?

5 A Not that I recall, no.

6 Q You suggested earlier that the Fleischer-Drinker study
7 was maybe the best information available in the early '50s
8 on asbestos insulation work; is that fair?

9 A Yeah.

10 Q Can you tell us to what extent Dow tried to follow this
11 program that Fleischer and Drinker discussed in their
12 article?

13 A Dow didn't follow the program, so far as I'm aware.
14 I'm not aware of any work the industrial hygiene group at
15 Dow did with asbestos in any form and certainly not with
16 thermal insulation.

17 Q Do you -- have you learned whether OCF's insulator
18 employees to any extent followed this program that Fleischer
19 and Drinker laid out in their 1946 article?

20 A I know very little about OCF and OCF employees. So,
21 the answer is no.

22 Q You know just what they choose to tell you; is that
23 right?

24 A They don't tell me very much. Let's put it that way.

25 Q Would I be right in thinking that if we -- if we added

12

1 up all of your consulting fees since you left Dow that OCF
2 would have paid you more than all the rest of the clients
3 combined?

4 A Oh, no. No. I don't think so.

5 Q No?

6 A No. If we did that, added up all my consulting fees
7 since I left Dow, what I have billed and been paid by OCF
8 might be as high as 20 percent of those fees. It certainly
9 wouldn't be any more than that.

10 Q You have been working for OCF in litigation since,
11 what, the late '80s?

12 A No. Since about '92.

13 Q Oh, that recently?

14 A Yes.

15 Q You had done some work in the late '80s for somebody
16 else?

17 A I did some work in the early '80s for OI through one of
18 their outside attorneys. He was trying to prepare me to
19 become a state-of-the-art expert for OI. That culminated in
20 a portion of a deposition and never did anything more from
21 OI than that.

22 In the mid '80s, I did some work. I did some -- I will
23 try and talk more clearly. I did some work for this
24 consortium of asbestos manufacturers in litigation. I was
25 in two or three trials for the firm of Foley & Lardener in

1 Milwaukee, but I never was aware of what companies were in
2 that consortium. So, I can't tell you much more than that.
3 It wasn't until about '92 that I got involved with OCF at
4 all.

5 Q Okay. In your consulting for Dow since you left the
6 company, has any of that involved occupational disease
7 claims?

8 A No.

9 Q Jumping back to the time you monitored removal of
10 asbestos-containing material from a building in
11 Milwaukee, --

12 A Yes.

13 Q -- I think you said that involved ceiling tile,
14 acoustical plaster, and some pipe insulation. Do you have
15 any recollection today what -- roughly when that was done?

16 A Yes. I can tell you when. 1984. In fact, in the fall
17 of 1984.

18 Q And for whom it was done?

19 A It was done for a company that used an acronym for its
20 name. The acronym was MARS, and I believe it was Midwest
21 Asbestos Removal Service from northern Illinois somewhere.

22 Q So, this was on an abatement project of a single
23 building for the abatement contractor?

24 A Yes, that's right.

25 Q Your asbestos brake shoe monitoring projects, I gather

1 at least one of these was done for Municipal Bus Company;

2 and there was more than one time you did this, right?
3 Milwaukee and St. Louis?
4 A Gee, excellent memory or whatever.
5 Q Short term.
6 A Yes. Milwaukee and St. Louis. Milwaukee a couple of
7 times and St. Louis once.
8 Q You monitored while the workers were turning the actual
9 asbestos brake shoes or pads on a lathe?
10 A These were brake blocks in St. Louis. I didn't do any
11 of that in Milwaukee. They didn't do any trimming of the
12 brake blocks there.
13 Q In Milwaukee?
14 A In Milwaukee. They did in St. Louis.
15 Q And do you remember what kind of dust levels you
16 measured there?
17 A They weren't hazardous in comparison to the TLV.
18 That's all I recall. I don't know the numbers.
19 Q Okay.
20 A I just know they weren't above the TLV or even a major
21 fraction of the TLV.
22 Q Did you do any monitoring when the men were blowing out
23 the brake drums?
24 A I don't really remember. What struck me was this
25 turning on the lathe of the darn brake blocks, and I

13

1 remember doing that. I did some other work there, too. I
2 was concerned about lead exposures and repairing radiators
3 and so forth, and I think that the only time I sampled for
4 asbestos was in this turning process.

5 Q So, you wouldn't have taken any area samples in the
6 shop?
7 A That's correct. Not for asbestos, at any rate. I
8 might have taken area samples.
9 Q And you weren't concerned one way or the other with
10 ventilation issues in the shop?
11 A No. The -- the results of my sampling were that there
12 wasn't any hazard involved in the process, certainly for the
13 people doing it, standing right there operating the lathe.
14 So, it -- there wouldn't have been a hazard for other people
15 either.
16 Q Okay. And in these cases you were hired by -- in these
17 instances you were hired by Municipal Bus Company?
18 A No. In St. Louis, I was hired by Fred S. James and
19 Company, insurance brokers out of Chicago, to monitor one of
20 their clients.
21 In Milwaukee, I was hired directly by the Municipal
22 Transportation facility or whatever they are called.
23 Q So, I suppose you, the way you figure it, that a person
24 doing brake work full-time is not going to get sufficient
25 occupational exposure to asbestos dust to cause disease?

13

1 A That was my feeling then, on the basis of the samples
2 that I took and the TLV at the time, yes.
3 Q Well --
4 A They were working very carefully, and they didn't put
5 much dust in the air. They certainly didn't go up there
6 with an air hose and blow dust all over the place. That had
7 been outlawed in both shops, I'm sure, for some time before

8 I got there.
9 In Milwaukee, they were experimenting, incidentally,
10 with brake blocks that didn't contain asbestos; and they
11 hated the things. They didn't work.
12 Q Okay. So, your opinion that you wouldn't get hazardous
13 asbestos dust levels doing brake work was based on
14 observations of how it was being done when you did this
15 sampling?
16 A In conjunction with the sampling results, yes.
17 Q Right.
18 A Yes.
19 Q Right. And then, it isn't necessarily an opinion about
20 conditions that may have existed in the past in any facility
21 or any workshop?
22 A That's correct.
23 Q Okay. I understand you now. Let's go back to the
24 University of Michigan when you were there with Warren
25 Cooke. Did you actually take courses from Mr. Cooke?

13

1 A Yes.
2 Q Was it Dr. Cooke?
3 A No. Mr. Cooke.
4 Q Mr. Cooke?
5 A He never even got a master's degree, to the best of my
6 knowledge.
7 Q Was it the Zurich Insurance Company that they were
8 with?
9 A Yes, that's it, Zurich. Thank you. Good for you. I
10 had forgotten. That tickled my memory.

11 Q A regular storehouse of knowledge here.
12 A Oh, obviously, yeah.
13 Q And had Mr. Cooke had experience as an industrial
14 hygienist other than at the insurance company, do you know?
15 A I really don't know. I never really talked to him
16 about -- very much about his past. I told you about the
17 radiation stuff, and I knew that he had worked for Zurich as
18 an industrial hygienist. But other than that, I didn't know
19 anything about his past.
20 Q Did you take courses from Warren Cooke himself?
21 A Yes, sir.
22 Q What were the subjects that you covered or he covered?
23 A General industrial hygiene. In fact, the course that I
24 eventually taught myself was modeled very much after
25 Warren's course at that time. So, again, to find out what

13

1 it is, read my book. Memorize my book.
2 Q Did you bring your book today?
3 A No, I didn't. I was sure you must have several copies
4 of it.
5 Q Well, if I knew where to get one, I would probably get
6 one.
7 A You would get it from ACGIH. They are the publishers
8 of the 1991 edition.
9 Q And you would autograph a copy if I sent it to you?
10 A I would be delighted to autograph a copy.
11 Q When did the book first come out?
12 A 1977.
13 Q Now, that's the one I would really rather have.

14 A That, I have one copy left; and that's one where the
15 cover was put on upside down. It was -- and somebody who
16 bought it sent it to me and said, "Can you send me a
17 replacement for this?"

18 And I said, "Sure." So, I traded.

19 But that's the only one I have left. I've made the
20 mistake of lending copies to attorneys, and I -- I never get
21 them back.

22 Q Did you have any other teachers that are worth
23 remembering from Michigan? Well, I mean, anybody with a
24 reputation or the big name that Warren Cooke had?

25 A Nobody can come to close to Warren's name. I took

13

1 toxicology courses from Herb Cornish, one or two courses
2 from him. I had a course in health physics from a Donald
3 Barber. And I've forgotten the name of the guy that taught
4 the analytical chemistry or analytical industrial hygiene
5 stuff. I had all the conventional course work there.

6 Q Did the doctoral program involve any field work?

7 A No. Certainly not for me. I had more field experience
8 than the sum total of the staff and the students at the time
9 I was there.

10 Q Well, I don't doubt it. Okay. You know, we were
11 talking sometime ago; and there were -- there was at least
12 one question that you didn't answer.

13 A Uh-oh.

14 Q And I should have written it out before we resumed; but
15 you had expressed a distrust for case reports of disease and
16 a high level of confidence, I think, in epidemiology

17 studies, particularly those that were supported by
18 industrial hygiene data or work.

19 A Sure.

20 Q And I was asking you whether you -- your philosophy was
21 to wait until you had a valid epidemiology study showing a
22 causal relationship between a material and a health effect
23 before you would implement controls to protect the workers.

24 A And I didn't answer the question?

25 Q I think that you didn't because that nasty gentleman

13

1 that was with you -- I mean, that was there started
2 objecting and then Mr. Almquist got into the act and it all
3 went downhill from there.

4 A At Dow -- to answer your question, at Dow --

5 MR. ALMQUIST: Let's -- just a minute. Do you
6 have a question pending, basically?

7 Q (By Mr. Blanks) I do. What -- if you were going to
8 answer that question that you didn't get to because of all
9 the attorney distraction, what would the answer have been?

10 MR. ALMQUIST: Just for my purposes of clarity,
11 can you tell me what the question is?

12 MR. BLANKS: See, here they go. Here they go
13 again.

14 MR. ALMQUIST: I haven't said a word all day, Joe;
15 but I am not really sure what your question is. I want to
16 be clear on that.

17 Q (By Mr. Blanks) Why don't you give me the answer; and
18 then, we'll figure out the question?

19 A Okay. That's fine. We are --

20 MR. JONES: Toxicology for 100.

21 A At Dow we often were involved in controlling exposures
22 when we had no idea what the TLV might be or what the
23 results of epidemiology might be or, in fact, what the
24 results of animal experiments might be, just based on the
25 idea that you try and keep exposures as low as practical.

13

1 And sometimes it was to avoid irritation. Sometimes it was
2 to avoid an increase in plasma or a decrease in plasma
3 cholinesterase or red cell cholinesterase or things on this
4 order.

5 So that, when possible, if I am making a decision, I
6 would like to base a decision of a TLV, if you will, on the
7 basis of chronic animal inhalation toxicology, as well as at
8 least a couple of good epidemiological studies of people who
9 are exposed. But we can't always have that. So, quite
10 often, we have to deal with part of that.

11 The problem with case reports is that very seldom do we
12 have any idea what the exposures have been. It's the very
13 odd, unusual case report that has exposure information; and
14 without that, the report is essentially worthless, as far as
15 I'm concerned.

16 Q (By Mr. Blanks) Okay. That seems to be a fair answer
17 to the question.

18 A That wasn't asked. Okay.

19 Q That in the best of all possible situations, you have
20 epidemiology studies backed up with industrial hygiene
21 studies where you could form an opinion about exposure
22 levels and consequences?

23 A And we'll also toss in animal studies, as well, with
24 that.
25 Q All right.

13

1 A One of my students at one time, when I was teaching at
2 the University of Illinois, formulated a thing with regard
3 to TLV's for cholinesterase-inhibiting materials,
4 insecticides, and pointed out that most of them had no basis
5 of animal studies, human studies, or anything else. They
6 were simply done by comparison with parathion and what it
7 would do to people and some ideas about how much less toxic
8 this stuff was than parathion. That's not a good TLV, as
9 far as I'm concerned.

10 Q But it's maybe better than nothing?

11 A Sure, absolutely, it can be better than nothing,
12 particularly when a number is decided upon by a group of
13 people who really are experts in the area and are giving us
14 their best guess. Although, it may be a best guess in the
15 form of a TLV; and it isn't labeled as a best guess.
16 Nevertheless, they probably know more about it than I do;
17 and, therefore, I'll go along with what they say.

18 Q Now, this didn't stop you folks at Dow from sometimes
19 validating these TLV's on your own. Am I right?

20 A That's correct.

21 Q And you had, obviously, the capability to do that when
22 you felt the need to?

23 A We can. And, in fact, on the basis of chronic animal
24 work, we sometimes promoted a Dow TLV, you are misusing the
25 term, that was lower or more restrictive than the TLV

1 committee and then tried to persuade the TLV committee that
2 that's the way to go. This was done particularly for vinyl
3 chloride. That's one compound that comes to mind where at
4 Dow we would allow exposures that were far less than the
5 TLV. That's all. Then, the stuff turns out to be a pretty
6 good liver carcinogen. We didn't know that at the time, but
7 the animal experiments had shown that it was doing things to
8 the liver that it shouldn't be doing at lower concentrations
9 than the TLV.

10 Q And I suppose if you hadn't have been looking for this,
11 it would have been a long time before it would have come to
12 your attention?

13 A Certainly a possibility that we can't discount.

14 Q And wasn't otherwise brought to your attention by
15 outside sources until, what, some years after Dow decided to
16 take an extra level of care with the vinyl chlorides,
17 correct?

18 A That's right.

19 Q On the subject of carcinogens, cancer-causing
20 materials, if we can go back to the Dow mind-set or
21 philosophy or policy program while you were working there,
22 was there a point where the company thought it ought to tell
23 workers about potential cancer hazards; and let me try and
24 be more precise with that preface.

25 If you suspected that a certain material were a

1 carcinogen, was it the Dow policy to inform workers of that
2 fact?

3 A Not per se. There was never such a policy. On the
4 other hand, if we suspected that a material was a carcinogen
5 and we were giving a talk in an area where this stuff was
6 handled, we certainly would mention that to the workers as
7 part of our presentation of the slide talk or in answer to
8 questions about it.

9 Q Okay.

10 A But we wouldn't make a special effort to go out and
11 say, "Hey, this stuff is -- can cause cancer. Stay away
12 from it." Instead, it was our policy to try and make sure
13 that people wouldn't get hurt, period, whether it was cancer
14 or whether the stuff would reach up and bite them in the
15 eye. This was our policy.

16 Q Okay. Let's move up the causal ladder a step to talk
17 about something that you regard as a possible carcinogen as
18 opposed to merely suspected. Was it the policy to tell the
19 workers potentially exposed about possible carcinogens?

20 A Same answer.

21 Q All right. How about the material that you had come to
22 regard as a probable carcinogen?

23 A Same answer, except that we probably wouldn't be
24 handling it. There were very doggone few known human
25 carcinogens amongst the chemicals that could have been

14

1 handled at Dow and that were handled at Dow. So, I am
2 talking about my perception of what our policy would be.

3 Right offhand, the only thing I can think of that Dow's
4 chemical employees might have been handling that was a
5 carcinogen was beta naphthalene; and we didn't have any beta
6 naphthalene in the plant, as far as I know. And this stuff
7 was a potent enough bladder carcinogen that we probably
8 would have said, "We don't want to handle it here. Somebody
9 else can handle it."

10 Benzidine came to be in that category, again; but we
11 didn't have any processes that used benzidine. So, it's a
12 kind of a moot question. I don't think it ever really arose
13 while I was at Dow.

14 Q Okay. How about if we ask those questions about
15 materials that you regarded as being a known carcinogen.
16 Was it the Dow policy while you were there to tell employees
17 they were working with a known carcinogen?

18 A In the same -- the same answer that I gave you before.
19 It's in conjunction with what we were doing in the plant.
20 If the question arose, we certainly would answer it that
21 way. We might have pointed out this the stuff is a possible
22 or possibly could cause cancer if the exposure is great
23 enough. I mean, we didn't hide things like this; but we
24 didn't make a special effort to go out and contact each
25 employee who might be exposed and say, "This stuff might

14

1 give you cancer."

2 Q Was there a reason why you wouldn't have done that?

3 A Sure. Every chemical handled at Dow, every chemical
4 handled at any chemical plant has the capability of killing
5 people. How that death occurs is kind of immaterial in many

6 respects. Certainly, to the person who dies, it's
7 immaterial how he died, once he is dead.

8 So that to single out cancer as being the thing to tell
9 people about, no, we didn't. We would tell them that the
10 stuff could chew up your liver; and as a result of that,
11 sure, you could die. It could chew up any organ you had;
12 and as a result of that, you could die. But we didn't focus
13 on the death. We focused on what one has to do to avoid the
14 injury this stuff can cause.

15 Q So, am I understanding that your approach, then, was
16 even with a -- merely a suspected carcinogen was to attempt
17 to minimize or eliminate the exposures wherever practical to
18 that material in your workplace at Dow?

19 A Sure. But you don't even have to use the word
20 "carcinogen." This was always our philosophy with
21 everything that we handled, to try and reduce exposures to
22 the lowest practical exposure.

23 Now, when we handled stuff that was extremely toxic for
24 one reason or another and, in particular, the
25 cholinesterase-inhibiting insecticides, we had plants that

14

1 were essentially enclosed. We isolated the plant from the
2 worker so that people just didn't have exposure to this
3 stuff; and we could use that technique with anything and for
4 any reason.

5 But we didn't have materials that we recognized as
6 being possible carcinogens in the plant when I was there.
7 So, to say that we had a policy, we didn't. I'm just
8 talking about Dow's philosophy or the philosophy of the

9 industrial hygiene group and how it would have treated such
10 things.

11 Q When did you first come to learn of mesothelioma as a
12 disease?

13 A 1965. The fall of 1965, August of 1965.

14 Q Back when you were at the -- when you went to the
15 university?

16 A That's right.

17 Q Would you be surprised to know that the API Medical
18 Advisory Committee had actually listed mesothelioma as a
19 tumor to follow in their tumor registry back in the early
20 1950's?

21 A Yes. That would surprise me. They must have had a
22 pretty good crystal ball.

23 Q Did you ever have any contact with the folks at
24 Kettering Institute?

25 A "Ever" is a big word. Ever. I have been to the

14

1 Kettering Institute, and I have given talks to the NIOSH
2 people in conjunction with a foundry survey that we did. I
3 guess I have been at Kettering three or four times in my
4 life.

5 Q Ever meet Dr. Kehoe there?

6 A No, never did. I know about Dr. Kehoe, but I've never
7 met him.

8 Q J.J. Fair?

9 A I know about him, too, but never met him.

10 Q Okay. Did you ever learn of the epistudy that the
11 folks at Kettering had begun for the API member companies in

12 the '50s?

13 A No.

14 Q Let me run through some names here that we didn't get
15 to talk about last time and maybe you can tell me if you
16 know what these people did. And these are going to be Dow
17 names, I'm thinking.

18 A Okay.

19 Q Dale McCouskey?

20 A Doesn't ring any bells.

21 Q R.H. Boundy?

22 A Yes. Dr. Boundy was one of the high muckity-mucks at
23 Dow in the laboratory area; but exactly what his job was, I
24 don't remember.

25 Q An M.D. or a Ph.D?

14

1 A No, Ph.D.

2 Q Roy De --

3 A Degesero.

4 Q Degesero.

5 A Roy went to the industrial hygiene lab, was hired by
6 the industrial hygiene group after I left. I had dinner
7 with the industrial hygiene group at a couple of the annual
8 meetings and met Roy that way.

9 Q Now, did that have plants outside the United States
10 while you were there?

11 A Yeah. In Canada.

12 Q Did they have any in the Netherlands, South America,
13 or --

14 A Not that I'm aware of. It could well have happened. I

15 just didn't know about it.
16 Q And what was Roy's background?
17 A I don't know. I know he was an industrial hygienist
18 working for Royal, and that's all.
19 Q Oh, he was there while you were there?
20 A No.
21 Q No?
22 A He left. I left; and then, Roy came.
23 Q Oh, I see. Excuse me. Let's see. Dr. Gay, do you
24 remember him?
25 A Oh, yes, very well.

14

1 Q And his job was?
2 A He was director of the medical department.
3 Q During the --
4 A Whole time I was there.
5 Q Okay. How about Dr. Earhart?
6 A That doesn't ring a bell at all.
7 Q Did you ever meet John Hill?
8 A John Hill was working at the Pittsburg, California
9 plant as an industrial hygienist. And, yes, I did meet
10 him. He came to Midland once, I believe, and was there for
11 a couple of days; and that's the extent of it.
12 Q Do you remember him also being out at Rocky Flats at
13 some point?
14 A That could be. No. I don't remember that, but I
15 wouldn't be surprised.
16 Q How about a fellow named Hobbs, Farrell David Hobbs?
17 A I'm sure that I met him at one time, but I don't place

18 him.
19 Q Let's see. Donald Irish we spoke of earlier.
20 A He was director of the Dow Chemical research
21 department.
22 Q How about Wilbur Kittinger?
23 A No.
24 Q Dr. Leong, L-e-o-n-g, Basil K. Leong?
25 A Basil Leong worked at the -- worked for V.K. in the

14

1 toxicology group.
2 Q While you were at Dow?
3 A I think he was there when I was there. It was -- we
4 may have crossed paths. I am certainly aware of him since
5 that time. So, we may have been contemporaries for a year
6 or six months or something like that.
7 Q Was he a, you say, a toxicologist?
8 A Yes.
9 Q How about Don McAllister, what was he?
10 A Don McAllister was a toxicologist, and he was a guy who
11 did the writing of warnings on labels for Dow products.
12 Q Did you do any work on the label project?
13 A Don occasionally would ask the industrial hygiene group
14 how this stuff was handled in the plant and what the
15 consequences of overexposure were or something on that order
16 and I was one of those he asked and I had some input on a
17 few labels, not very many.
18 Q How about Kenneth Olson?
19 A Ken was in the tox lab and did the acute work, the --
20 he exposed the animals by ingestion. With ingestion, you

21 put a tube down into them. He exposed rabbit eyes and so
22 forth. He did that kind of stuff.
23 Q Let's see. Dr. Peterson is in here, too.
24 A Oh, my goodness. I know him well.
25 Q How about Ed Putnium?

14

1 A No. That name is not familiar.
2 Q Let's see. V.K. Rowe you spoke of.
3 A I know V.K. very well, and I know you have met him and
4 talked to him at length.
5 Q Indeed I have and quite enjoyed it, as well. Arnold
6 Shaffer?
7 A Shaffer.
8 Q Shaffer.
9 A He was the guy after Larry that we hired.
10 Q After Larry Silverstein?
11 A Silverstein, yes. The next guy was Arnold. Arnie and
12 Jackie were there for several years. Before I left, he got
13 involved with salespeople and wound up doing industrial
14 hygiene in the interest of sales. He spent several years in
15 Hong Kong, spent some time in Italy. I haven't seen Arnie
16 in years. I'm sure he is still around, but I don't know
17 where he lives or anything else.
18 Q How about Edward Schneider?
19 A Ed Schneider was one of the two employees that Harold
20 hired before me. He -- Ed was the first employee that
21 Harold had.
22 The next one was Jerry Clock. Jerry was there when I
23 was hired, and Jerry was asked to leave a few months later.

24 So, I was kind of a replacement for Jerry.

25 After me, the next one was Larry Silverstein and the

14

1 next was Arnie Shaffer, as I recall.

2 Q Okay. So, Mr. Shaffer was an industrial hygienist?

3 A Yes.

4 Q And Larry Silverstein was a --

5 A An industrial hygienist, --

6 Q -- industrial hygienist? I get it.

7 A -- with a background in health physics. He was also a
8 health physicist.

9 Q How about John Staudt, S-t-a-u-d-t?

10 A The spelling sounds familiar, but I don't place him.

11 Q Okay. Let's see. Ted Torkelson, you said, --

12 A I have talked about Ted.

13 Q -- came in as a toxicologist?

14 A Yeah. We traded jobs for a while, six months, a year,
15 whatever.

16 Q Okay. He stayed for a while?

17 A Oh, yeah. He retired from Dow, oh, a few years ago,
18 five years ago, maybe.

19 Q How about a Paul Weaver?

20 A Paul Weaver? No. Doesn't ring any bells at all.

21 Q Milton Weinfield?

22 A No. No bells.

23 Q Mark Wolf?

24 A Oh, yes. Mark is a toxicologist. He and his brother,
25 Paul, worked on the toxicology group. Mark was involved

1 more with the kinds of things that Ken Olson was doing than
2 anything else, as I recall. He preceded Ken. And one of
3 the two brothers is dead now, and I don't remember which
4 one.

5 Q Do you -- did you ever hear of the Silica Safety
6 Association?

7 A No.

8 Q It's a Texas outfit.

9 A Never heard of it.

10 Q For some reason or another I am -- I have got a note
11 here connecting Mr. Weaver, Paul Weaver, and Milton
12 Weinfield with this Silica Safety Association back in,
13 roughly, the mid '70s.

14 A It could be. It means nothing to me. I left Dow, of
15 course, in '65. So that means nothing to me.

16 Q Well, fair enough. Okay. Mark Wolf was the last one.
17 You knew him. Did he publish a book, too, that you know of?

18 A He had his name on some papers. I don't know about a
19 book, though.

20 Q Moving over to the silica realm for a few minutes.

21 A Okay.

22 Q Let me hand you our Exhibit 530400 API and ask you to
23 take a look at that, Dr. Peterson. So that the suspense is
24 removed in the room, could you at least read what the title
25 of this paper is, if you can find it there?

1 A "API Toxicological Review - Silica," April, 1953. I
2 have never seen it before, if that was your question.
3 Q Well, that's what I was getting to. Would I be right
4 in thinking that you didn't even know that the API published
5 toxicological reviews?
6 A I think that's a fair approximation of my knowledge,
7 yes.
8 Q Okay. You might notice here on the cover it says this
9 was prepared at the Harvard School of Public Health; Boston,
10 Massachusetts, under the direction of Professor Philip
11 Drinker.
12 A Philip Drinker. My goodness.
13 Q You've heard of him?
14 A Oh, yes. I know who Phil Drinker was.
15 Q Do you want to just take a quick, hasty overview of
16 this and see if this -- if Dr. Drinker's work on silica
17 seems to be appropriate for that time period when you first
18 started plying your profession?
19 A This is done in a manner very similar to that of
20 "Hygienic Guides" that we have talked about.
21 Q Is it -- is it according to the new, improved Peterson
22 format for guides --
23 A No.
24 Q -- or the antiquated method?
25 A The antiquated method, of course. No. It's the same

15

1 kind of information. It isn't in the same format at all
2 that the "Hygienic Guides" were in. But, yeah, this seems
3 to be very appropriate; and I would expect that from Phil

4 Drinker.

5 Q Mr. Taylor, would like to look at that.

6 MR. JONES: Since he passed judgment on it, I
7 would like to have it attached as an exhibit.

8 (Marked Exhibit No. 530400API and is attached
9 hereto.)

10 MR. BLANKS: Well, certainly, Mr. Jones. I would
11 be only too happy to accommodate you.

12 MR. JONES: All right. Thank you.

13 Q (By Mr. Blanks) You have never seen this before, but
14 did you know that the API had a number of toxicological
15 reviews prepared by Drinker back in this era of the early
16 '50s?

17 A No. Afraid not.

18 Q Let me put another paper in front of you, sir. This is
19 our Exhibit 340209 EXX0 and ask you to read the title on
20 that for everyone's benefit.

21 A "Standard Oil Company, (Incorporated in New Jersey),
22 Medical Safety Memorandum, Safeguarding Sandblasting
23 Operations."

24 Q What would the date be on that?

25 A The date is 1934. I don't see an author listed. There

15

1 may well be one, but I don't see it. This is a very
2 complete look at sandblasting. Oh, the authors are
3 something J. Denno, MD; and R.S. Bonsib, Chief Safety
4 Inspector.

5 Q Dr. Denno, was it?

6 A Yes.

7 Q Would -- having glanced through that and looked at the
8 table of contents, would you say that lays out a sensible
9 program for protecting workers engaged in sandblasting?
10 A Yes.
11 Q And as previously discussed, the general principles
12 covered and the methods for controlling the dust hazard are,
13 basically, the same ones that you used at Dow generally 20
14 years later and still recommend even 60 years later today?
15 A Sure.
16 Q Okay.
17 MR. JONES: Would you humor me and attach that as
18 an exhibit, too, Joe?
19 MR. BLANKS: Why sure, Mr. Jones.
20 MR. JONES: Thank you, sir.
21 (Marked Exhibit No. 340209 EXX0 and is attached
22 hereto.)
23 Q (By Mr. Blanks) I'll -- let me. If you will, let me
24 put another booklet in front of you that I don't intend to
25 attach because it's well-known to the denizens of this

15

1 litigation but which is our famous Exhibit 370715 EXX0 and
2 ask you, Dr. Peterson, if you have ever seen this brochure
3 entitled "Dust-producing Operations in the Production of
4 Petroleum Products and Associated Activities." And before
5 you go dashing past the cover page, you might note, just
6 coincidentally, who the author is and who authored the
7 foreward.
8 A The same two people, Roy S. Bonsib and Willard, it is,
9 J. Denno, MD; and, yes, I have seen this.

10 Q This would have been back when you were a young
11 industrial hygienist at Dow?
12 A No. The first time I saw this was in conjunction with
13 a trial in Donaldsonville, Louisiana, about three years ago.
14 Q Did you have a chance then to look at this booklet with
15 a little attention?
16 A Yes, I did.
17 Q This is described on the cover as being a "Medico -
18 Safety Survey." Is that a -- it's not a terribly exact
19 term, but is that a fair description of what's contained
20 therein?
21 A It is, sure.
22 Q And am I right that Mr. Bonsib, it looks like, made a
23 survey of the pertinent literature that would deal with dust
24 hazards you might encounter in a petroleum plant?
25 A Yes, he did.

15

1 Q And actually caused some sampling to be taken in
2 connection with the different activities that he
3 discusses, --
4 A Yes.
5 Q -- which results he reports in the booklet, correct?
6 A Yes.
7 Q And most significantly, Mr. Bonsib lays out a program
8 for the control of the dust hazards, does he not?
9 A He is an industrial hygienist. We always do that, yes.
10 Q And discusses a medical monitoring program as part of a
11 good program?
12 A Yes.

13 Q All of this effort focused on the prevention of the
14 occupational disease, correct, sir?
15 A Yes, sir.
16 Q You certainly can look inside if you need to refresh
17 your memory; but among the topics discussed in some detail
18 within would be sandblasting, am I right?
19 A Yes.
20 Q And insulating work, as well?
21 A He mentions that. I recall that. That's what I was
22 interested in before. But I read the whole thing. So that
23 for 1937, this is a good piece of work. That's all there is
24 to it. He did a good job.
25 Q Would you flip over there to the back? I think there

15

1 are some acknowledgments given, if I remember it correctly;
2 and it may be the last page.
3 A The last page. Well, it could be.
4 Q There we go.
5 A Yes. We have them here. Oh, boy.
6 Q There are several people mentioned. Which of those
7 names do you recognize?
8 A I recognize W.P. Yant, Leonard Greenburg, R.R. Sayers,
9 A.J. Lanza, and that's it. I don't know the others. Never
10 have heard of the others.
11 Q All right, sir. And as to the ones you do remember, am
12 I correct in saying these were some of the leading lights or
13 the major figures in industrial hygiene in the years before
14 you got out of high school?
15 A That's right. Precisely. They were, those that I

16 recognize. I don't know about the others, but those I
17 recognize were.
18 Q And among those you didn't recognize, at least
19 according to Mr. Bonsib, Dan Harrington was affiliated with,
20 what, the Bureau of -- US Bureau of Mines?
21 A Yes.
22 Q An organization that was fairly active in industrial
23 hygiene matters during that era, correct?
24 A It was quite active, yes.
25 Q Why would they be in that field?

15

1 A Well, mines have all sorts of hazards but they were
2 particularly involved in the testing of respirators and gas
3 masks and so forth in their laboratory but they also were
4 involved in the control, particularly, of dust hazards in
5 mines.
6 Q And there is a Mr. --
7 A Barlow.
8 Q -- Barlow, Chief Engineer for Standard Oil Development
9 Company. I'm not sure what that is. And then, a Mr.
10 Blakeslee, who was he with?
11 A Department of Accident Prevention, API, New York.
12 Q And would it be fair to say that what Mr. Bonsib lays
13 out here in the -- in his booklet and in the conclusion
14 summary would represent the state-of-the-art for controlling
15 dust hazards in -- at the time this booklet was put out?
16 A Yes.
17 Q Thank you. Let me --
18 THE WITNESS: Do you want to see this?

19 MR. TAYLOR: I don't think so.

20 MR. ALMQUIST: He has already read it.

21 A I'm sure he has.

22 Q (By Mr. Blanks) -- share with you -- let me share with
23 you another piece of paper from the past, sir. This is our
24 Exhibit 450702 SHEL. The cover is kind of faded and was
25 probably green paper, if I remember, but this is titled

15

1 Shell Oil Company, Inc., "Carcinogenic Hydrocarbons and
2 Related Compounds - A Literature Survey"; and I'll fold that
3 back and hand it to you so you can see it a little more.
4 This was authored by a Mr. H.H. Zuidema. Is that name at
5 all familiar to you, Dr. Peterson?

6 A No, sir. I have never seen that name before. You know
7 how to spell Zuidema, of course?

8 Q I'll tell you that Bud Zuidema, as he was known, was
9 kind of the original Shell answer man, --

10 A Oh.

11 Q -- a chemist; and he would field customer questions in
12 the way that you men at Dow probably did from time to time
13 about products and toxicity or handling methods and that
14 sort of thing.

15 A We all did.

16 Q Flip back to the -- well, no. Take your time. I'm
17 sorry. Continue.

18 A I'm -- I'm getting there.

19 Q No. No. That's all right.

20 A Slow but sure. Where did you want me to go?

21 Q I was just going to point you to -- and did you note on

22 the front side this said, "This is a contribution of
23 information to members of the API Medical Advisory
24 Committee"?
25 A Yes, I noticed that.

15

1 Q Okay. An outfit that you never had anything to do
2 with?
3 A Not a thing.
4 Q Let me point you down here to this bottom paragraph
5 where Mr. Zuidema is talking about compounds reported as
6 having cancer-producing ability in 1945. Start down here.
7 A Yeah. Asbestos.
8 Q He does mention asbestos as a material that's been
9 mentioned, along with some others, correct?
10 A Along with aqueous potassium hydroxide and hydrochloric
11 acid, ethyl alcohol, glucose, fructose. Okay.
12 Q Does it surprise you to see asbestos mentioned as a
13 possible carcinogen in 19 -- in the 1945 literature review?
14 A It surprises me more to see fructose listed than to see
15 asbestos listed.
16 Q So, you are not surprised to see the asbestos?
17 A Yes. But I'm even more surprised to see fructose.
18 Q I knew you would be.
19 A I'm surprised it doesn't list water.
20 MR. BLANKS: Objection. Very nonresponsive.
21 Q (By Mr. Blanks) We are out of tape. We are out of
22 time, again. Take a quick breather, sir.
23 A Okay. I'll do that.
24 (After the break, the proceedings continued as

25 follows:)

16

1 Q (By Mr. Blanks) Let's tumble on here. The night is
2 young. Okay. Back on the record, Laura.

3 A It's working. Okay.

4 Q Well, I hope there is a tape. Oh, goodness. Let's
5 see.

6 (Interruption.)

7 Q (By Mr. Blanks) Let's see. We talked about labeling
8 at Dow and how your input would sometimes be enlisted,
9 anyway. The tox and IH and medical departments had some
10 contribution to make to labels in Dow products, right?

11 A Yes.

12 Q And the view was it was important to let the consumer
13 or purchaser know what the ingredients were and as much as
14 you could on a label about what they ought to do to handle
15 and use it safely, right?

16 A Yes.

17 Q And was it ever suggested at Dow that there was health
18 hazard information that you really didn't want to put on the
19 product, you didn't want the consumer or the customer to
20 know about?

21 A Never. We didn't keep any secrets at all about health
22 hazards.

23 Q Well, speaking as a health professional, I mean, would
24 that have been a reasonable thing to do, to withhold
25 information about the health hazards of your products?

1 A No. It doesn't do any good to try to do that, in the
2 first place. In the second place, it's just not the thing
3 to do.

4 Q Bouncing back to the TLV for a minute or two.

5 A And I'm glad you are keeping it in order.

6 Q Yeah. Well, keep you on your toes here.

7 A Of course.

8 Q Wouldn't you say that a decision to control dust just
9 to the TLV level is necessarily, also, a decision to subject
10 some percentage of a large work force to exposures that
11 could cause disease?

12 A Are you asking me if I would say that?

13 Q Yes, sir.

14 A I would say that the probability is that if you do as
15 you said, that is, hold things right at the TLV, that there
16 will be some evidence of disease in some fraction, small
17 fraction of the work force. That's a given.

18 Q Okay. And would I be right in thinking that if you --

19 A Well, wait a minute. Let me back up a little bit.
20 That is true for those materials for which the TLV relates
21 to hazard or injury. There are several TLV's and always
22 have been that have no relationship whatsoever to hazard or
23 injury.

24 For instance, the TLV for carbon dioxide, the TLV for
25 several of the freons and so forth. They are simply

1 representing good practice and nothing else. So that one

2 can't say that the TLV relates to toxicity at all. It just
3 simply does not always. Sometimes it does.
4 Q Okay. All right. But if we speak of things such
5 asbestos, silica, benzene, and I'm sure many others you
6 could mention, --
7 A I could.
8 Q -- but not all materials, that that proposition would
9 be true?
10 A Yes.
11 Q How would it be possible for an industrial hygienist to
12 say that workers with, say, an asbestos insulation material,
13 for example, or a sandblasting operation or a foundry
14 operation where you are having dust produced from some
15 pneumoconiosis-causing material, how can an industrial
16 hygienist know that there is a safe level of exposure in
17 that workplace if he doesn't do sampling of the air in that
18 workplace?
19 A He can't know without sampling. He can infer sometimes
20 on the basis of work he has done elsewhere or that other
21 people have done and have published.
22 Q If we think about the foundry workplace in general and
23 in particular in the workshops where men would clean the
24 castings, --
25 A May we back up a minute?

16

1 Q Sure.
2 A Are we talking about an iron or steel foundry or
3 aluminum foundry or a brass foundry? It makes a difference.
4 Q Okay. Let's assume a cast iron foundry where you might

5 be making fireplugs and that sort of product.

6 A Okay.

7 Q In the cleaning room, what would be the sources of
8 pneumoconiosis-producing dusts?

9 A Okay. In the first place, the areas where dust is
10 produced will be anyplace that the casting is moved, whether
11 it's moved on a roller conveyer, whether it's moved on a
12 shaker conveyer. Sometimes, if a rubber continuous conveyer
13 is operated precisely, you don't get much dust produced by
14 that. You get dust produced any time the casting is dropped
15 from the conveyer to something else. You get dust produced
16 any time you get a change in direction of the conveyer, to
17 turn a corner or something on this order. These are --
18 these are all dust-producing areas that, in general, in this
19 kind of a foundry need to be ventilated.

20 Q Now, how do you provide the ventilation for these kind
21 of areas?

22 A This -- it's an arcane art, really. Quite often,
23 people try to ventilate these areas by using overhead --
24 overhead hoods, canopy hoods. These don't work worth beans
25 for most of these areas simply because at this point in the

16

1 game the dust isn't that hot and it may not rise at all. It
2 may be at the behest of vagrant drafts that come through.
3 So that, quite often, the best kind of a hood is a side
4 draft hood that has an adequate control velocity at its
5 furthest reach, wherever the furthest point is that dust may
6 be produced.

7 But each situation really needs an expert analysis

8 either by an industrial hygienist or by one of the few
9 ventilation engineers who knows what he is talking about
10 before you can get adequate local exhaust ventilation.

11 Q And it's the mould sands on the casting that is the
12 source of the silica dust?

13 A It's either the mould sands or it's the core sand, one
14 or the two or both, that is going to cause you trouble.

15 Q Okay. Have you found harmful levels of dust around the
16 blast cabinets or tumbler-type cabinets that are used in
17 foundries, Dr. Peterson?

18 A Yes, I have.

19 Q Would it be accurate to say that the cleaning room is,
20 in all likelihood, the most hazardous place in the foundry
21 for dust exposures?

22 A In every foundry I have done an industrial hygiene
23 survey, that is true.

24 Q Is it practical to protect men working in such a
25 workshop where the cleaning is done, is it practical to

16

1 protect them simply with respirators?

2 A No.

3 Q Why would that not be so?

4 A In the first place, it's too hot. Almost always in a
5 cleaning room the temperatures are in excess of ambient,
6 even though the castings aren't red hot at this point in the
7 game; and they may well be red hot. Even if they aren't,
8 they are still warmer than surrounding air; and therefore,
9 things tend to rise. The air rises and carries the dust
10 right along with it. But that also means that there is

11 radiant heat hitting these people and they get hot and they
12 simply don't wear respirators.

13 I have seen situations where supervisors have
14 practically stood over people on a cleaning line with a club
15 trying to get them to wear respirators. They simply won't
16 do it. As soon as the guy's back is turned, the respirator
17 is off and around their neck or whatever.

18 Q And so, to expect a man to wear a mechanical respirator
19 throughout his 8-hour workday in such a workshop is just to
20 expect something that's not going to happen?

21 A Let me agree with that, if we can substitute a word or
22 a phrase for a word, an air-purifying respirator. If you
23 use a hood, an air-supplied hood, and I have seen this done,
24 too, this could be done successfully because the air coming
25 into the hood can be cooled and, in fact, the guy wearing it

16

1 may be more comfortable with the hood on than without the
2 hood on and, therefore, he will wear it, providing you can
3 make him more comfortable, and it's always men, never women,
4 in these situations, providing you can make him more
5 comfortable with respiratory protection than he would be
6 otherwise.

7 Q Okay. If we focus on a dust concentration in the air
8 at the level of the old TLV, 5 million particles per cubic
9 foot, for asbestos or silica, --

10 A Okay.

11 Q -- is that a level of dustiness that one can see with
12 the naked eye, Dr. Peterson?

13 A Under most circumstances, no, if we are talking about

14 respirable dust.

15 Q All right.

16 A The dust is too small to see. Under the right
17 circumstances, you can see far lower concentrations. That
18 is, under Tyndall illumination with a shaft of bright light
19 coming into a darkened room, you can see dust motes floating
20 around.

21 Q Do you really see the dust motes, or do you just see
22 the absence of light there?

23 A No. You see the dust motes themselves. And, I mean,
24 this technique is used in some spectroscopic method and
25 Tyndall was the guy who did it and was first named for

16

1 things in liquids rather than air but it's the same
2 process. You can see extremely low concentrations of dust
3 in the air with Tyndall illumination. But under ordinary
4 illumination, such as we have here, we could have 5 million
5 particles per cubic foot of respirable dust; and we would
6 never see it, except maybe a haze in appearance from here to
7 the far wall or something like that.

8 Q When did you acquire your knowledge that there was some
9 synergistic effect between asbestos inhalation and smoking
10 cigarettes?

11 A Sometime in the late '60s, early '70s. One of the
12 papers by Selikoff, I'm sure, was what clued me in.

13 Q If one were addressing the -- in a safety manual
14 questions about asbestos or silica, would it be a reasonable
15 warning to a workman to simply state that asbestos was an
16 irritant to the lung?

17 A No. I don't think that it's a reasonable warning to
18 say that asbestos is a carcinogen, either. I think that
19 what one has to say in a warning label is something to
20 remind the person of what he already knows, what he has
21 already been taught; and that is, that one wants to avoid
22 exposure to the dust of this material. The reasons for
23 avoiding the dust exposure should be part of education, and
24 a label is not part of education. A label is a mind jogger,
25 a reminder, if you will.

16

1 Q Okay. Back in the context of a workplace manual or
2 safety manual, would a statement that silica was an irritant
3 to the lung be adequate warning or instruction to a workman
4 who might have exposure?

5 A No.

6 Q Did you do any work on safety manuals while you were at
7 Dow?

8 A Not while I was at Dow.

9 Q Okay. Did they have safety manuals at Dow for the
10 employees in the plant?

11 A Yes. The safety department passed out a safety booklet
12 when you were hired and went through the safety department.

13 Q This would have been sort of a general handbook?

14 A Yes. Very general, talking about using side shield
15 safety glasses when they are required, when a face mask is
16 appropriate, and so forth.

17 Q Then, would there have been more specific manuals that
18 would apply to the particular units in the plant, as you
19 remember them?

20 A Not while I was there, that I recall.
21 Q So far as you know, the plant safety booklet was
22 prepared by the safety department and not by industrial
23 hygiene or medical or do you -- do you know at all?
24 A I don't know how it was prepared. I certainly had no
25 input to it. Let's put it that way.

16

1 Q Up to 19 -- they wait for me to start speaking.
2 A Of course.
3 Q Up to 1965, Dr. Peterson, when you left Dow, was there
4 any material in the Dow safety manuals or safety booklets
5 about dust hazards in the Dow plants?
6 A I don't think so. I could be wrong. It's been a long
7 time since I have read the safety manual I was given when I
8 was hired in '52. So, that could be; but I don't recall.
9 Q Okay. Well, we can certainly look in the book, if we
10 can find one?
11 A Yes.
12 Q You said in your earlier conversation with me that you
13 recognized Saranac Laboratory as at least having a good
14 reputation in the early 1950's; and then, we moved on to
15 something else. And I'm wondering, did you ever meet any
16 folks who worked there, like Dr. Vorwald, for instance?
17 A I met Dr. Vorwald but not while he worked there. I met
18 Dr. Vorwald when he was running the industrial hygiene and
19 toxicology programs at Wright State, and that was well after
20 his work at Saranac Lake.
21 Saranac Lab or Saranac Lake Laboratory or whatever they
22 called it had a reputation as being the only laboratory in

23 the country that had the facilities to expose animals to
24 dust in uniform concentrations. And, in fact, when we
25 talked about that, and we did talk about it, we weren't at

17

1 all happy with what they were doing but -- how they were
2 doing it but we didn't know how to tell them how to do it
3 better.

4 So, one of the projects that perennially occurred in
5 the industrial hygiene lab was how to achieve a standard,
6 repeatable dust concentration in a volume of air; and we
7 never did get a good answer to that.

8 Q Did there come a time when you learned that silica was
9 a suspected human carcinogen?

10 A Yes.

11 Q Roughly, how long ago was that?

12 A About two years.

13 Q Had you ever suspected that as a possibility earlier?

14 A No.

15 Q As in terms of controlling or, yeah, controlling the
16 potential exposures in the workplace, whether it was or was
17 not a carcinogen, wouldn't have affected your efforts as an
18 industrial hygienist, would it?

19 A No.

20 Q Your aim would have been to get the exposure down as
21 low as practical, in any event, right?

22 A That's right, precisely.

23 Q On the topic of carcinogens and TLV's, wasn't it the
24 case that TLV's were not set at levels intended to or to
25 deal with cancer risk?

1 A That's in general true until we get into the late '70s
2 and '80s; and then, the ACGIH TLV committee started dealing
3 with cancer as a possibility.

4 Q So, if we are looking at asbestos or silica back in the
5 '40s, '50s, '60s, the TLV was not intended to protect from
6 possible cancer exposure?

7 A No, not directly. Most of us at that point in the game
8 didn't think that asbestos was a carcinogen. There were a
9 few who did; and those who did were just certain when they
10 published this, in the many articles that I've read, that if
11 you could avoid silicosis, you would avoid cancer. And the
12 TLV was designed to avoid silicosis. So, if they took that
13 step, they would say, okay, the TLV would prevent cancer.

14 MR. JONES: Excuse me. You said "silicosis." Did
15 you mean "asbestosis"?

16 A I'm sorry. I meant asbestosis. If I said silicosis, I
17 was wrong. It was asbestosis.

18 MR. BEASON: Thank you.

19 Q (By Mr. Blanks) So, how is it --

20 MR. BLANKS: And then, I have to object to the
21 responsiveness of the answer.

22 A Okay.

23 Q (By Mr. Blanks) How is it -- how is it that you can
24 say that most of us, as in, I suppose, most of us industrial
25 hygienists, didn't believe that asbestos could cause

1 cancer? In the first place, what time period are you
2 referring to?

3 A The '50s and '60s. Until the advent of the Selikoff
4 presentation that we have talked about in 1964 from the
5 animals or for the New York Academy of Science and whatever
6 Academy of Science, I -- there were very few of my
7 colleagues who felt that asbestos was a carcinogen.

8 Q Did you base this on some survey you made or what?

9 A No. Just the talk that we had amongst ourselves and
10 the fact that when the Selikoff data became known in 1965,
11 it was regarded as being shocking by everybody I talked to
12 about it.

13 MR. JONES: Excuse me. You said "silica" again.

14 THE WITNESS: I did? I'm sorry.

15 MR. BLANKS: No. He said "Selikoff."

16 THE WITNESS: I said "Selikoff."

17 MR. JONES: Selikoff. I'm sorry.

18 MR. BLANKS: Listen up back there.

19 MR. JONES: I can't hear over your hammer.

20 Q (By Mr. Blanks) So, don't you know that Dr. Lanza in
21 his 1938 book on silicosis and asbestosis listed cancer as a
22 suspected sequelae of asbestosis?

23 A No.

24 Q And --

25 A But even if I had, again, the TLV was set to prevent

17

1 asbestosis. So, if you prevented asbestosis, you prevented
2 the cancer that could come about as a result of asbestosis.

3 Q And don't --

4 MR. BLANKS: I object to the responsiveness of
5 that last sentence.

6 Q (By Mr. Blanks) And don't you recall that Dr. Hueper
7 in his 1940 text on occupational tumors targeted asbestos as
8 a probable cause of cancer?

9 A No.

10 Q Do you not remember the 1945 editorial in JAMA,
11 "Journal of American Medical Association" that raised
12 asbestos in connection with lung cancer?

13 MR. TAYLOR: It was '49.

14 A I remember seeing or reading such an editorial but it's
15 been too long ago and I certainly can't associate a date
16 with it. Was that one that Hueper wrote?

17 Q (By Mr. Blanks) No. I think it might have been Morris
18 Fishbein. Certainly, he was the author in 1949 of another
19 editorial.

20 A I remember a couple of things that Dr. Hueper wrote,
21 one in the '50s where he said that cigarettes were not
22 carcinogenic, cigarette smoke was not; and another one where
23 he said that aniline was. And it turns out that he was
24 wrong in both instances. Nobody is right all the time, even
25 a Skeepers or a Hueper or a Peterson.

17

1 Q Let me share with you a little treasure here from 1948
2 that is our Exhibit 481122 API; and I hand you a copy there,
3 Dr. Peterson. This was a memorandum of November, 1948, a
4 subject paper read by Dr. W.C. Hueper on the subject of
5 occupational cancer before the APHA. And it's in the form

6 of a letter to or a memo to Dr. Woody, whom I'll represent
7 to you, sir, was a company doctor with Standard Oil Company
8 of New Jersey back in this era.
9 A Okay.
10 Q Do you want to look further? It's more interesting
11 than just the first page. Look who wrote the memo. Do you
12 recognize the name of the author?
13 A Clyde Berry. Yes, I know Clyde quite well.
14 Q Yes, sir.
15 A In fact, people have mistaken the two of us when they
16 look at us from the rear. Our heads look the same.
17 Q I see.
18 A I'm a little taller than Clyde, but I have been called
19 Clyde many times by our peers.
20 Q Well, I think that's not an insulting
21 misidentification. Have you ever seen this Clyde Berry memo
22 of 1948?
23 A No, I never have.
24 Q You note that he reports on a paper given by Dr. Hueper
25 before the industrial hygiene section and subcommittee on

17

1 medical care of the American Public Health Association,
2 correct, --
3 A Yes.
4 Q -- back in Boston in '48? Now, this is the same
5 Dr. Hueper you were speaking of a moment ago, correct, --
6 A Yes.
7 Q -- the Chief of the Environmental Cancer Section, --
8 A Yes.

9 Q -- National Cancer Institute? And you know Clyde Berry
10 in later years went on to the University of Iowa as a
11 professor?

12 A Yes.

13 Q But during the late '40s and I think early '50s was the
14 industrial hygienist with Standard Oil in New Jersey?

15 A I didn't realize that.

16 Q Well, I'll tell you that that's true. At least, he
17 admits to it.

18 A No. That's fine. I have no objection. I just didn't
19 happen to know it.

20 Q Okay. In this memorandum, Dr. Berry mentions recent
21 evidence in the second paragraph there and pointed out a
22 definite correlation between cancer incidents and exposures
23 to ultraviolet radiation, asbestos, benzol, and it goes on
24 with some other things here. You may comment on them, if
25 you wish.

17

1 A Certain -- "certain organic amines" refers to aniline
2 in this context, and it's wrong.

3 Q Okay.

4 A I'm sorry. At this point in the game, Dr. Hueper
5 believed that aniline was a cause of bladder cancer.

6 Q All right.

7 A He was wrong, but that's fine.

8 Q Okay. Read what the suggestion is for an idealized
9 approach to the control of the problem and --

10 A Well, one, "One first evaluates the carcinogenicity of
11 suspected compounds and materials through animal

12 experimentation." I have talked about that.

13 "Investigate vital statics records for cases of cancer
14 and trace the employment history of these individuals. In
15 certain instances, it might be necessary to employ Social
16 Security records and so forth." In other words, do the kind
17 of epidemiological study that most epidemiologists do. They
18 count dead bodies.

19 "In cases that the foregoing provides evidence
20 pointing to an unusual incidence of cancer in certain
21 industries, the plant records of that industry will be
22 investigated to determine what quantities and exposures
23 within that industry produces a higher incidence of
24 cancer."

25 Gee, this is exactly what I said to do, isn't it?

17

1 Q All right. Yes. Yes.

2 A "Medical diagnostic procedures must be proved as a
3 great many cases are being --"

4 Q Improved?

5 A Improved, I'm sorry. "-- as a great many cases are
6 being missed at the present time." Well, that's a guess.

7 Q You don't -- you don't really disagree with that --

8 A No, I don't.

9 Q -- proposition, though, do you?

10 A Not at all. I -- one of the things that I have found
11 in my investigation of epidemiological studies is that one
12 of the things that is absolutely necessary, particularly
13 when one is talking about cancer, is what cellular type the
14 cancer originates in. Things that are called lung cancer

15 but actually originate in the brain and the kidneys are not
16 lung cancer. That's metastasis. So that this is one of the
17 areas where the pathologist must get involved, as well as
18 the physicians. That may be said in here as we go on.

19 "Initiate preventive measures as soon as possible
20 since the identification of the offending agent is not
21 necessary. Industrially, the approach would be as follows"
22 and that's --

23 Q Now, let's pause with that Paragraph 5 a second. Am I
24 right --

25 A Yeah.

17

1 Q Well, we don't know exactly what Mr. Berry thought; but
2 do you get out of that statement in Paragraph 5, "Initiate
3 preventive measures as soon as possible since the
4 identification of the offending agent is not necessary," is
5 that saying to you that you don't have to know exactly what
6 it is about the material that is necessarily causing the
7 cancer, you just need to have your suspicion sufficiently
8 aroused that there is probably some connection or possibly
9 some connection?

10 A That appears to be Clyde's interpretation of what
11 Dr. Hueper said.

12 Q Okay.

13 A I don't think it's Clyde's opinion, and it certainly
14 isn't mine.

15 Q Okay.

16 A But that I would suspect that Dr. Hueper thought this
17 way. That's fine.

18 Q Okay. Now, as a practicing industrial hygienist at
19 Dow, trained by the Dow people, it wasn't your approach to
20 wait until you had every bit of positive evidence and as
21 high a degree of certainty as you could get before you would
22 take preventive steps to try and cut down exposure, was it?
23 A No. I've talked about what our approach was, and it
24 wasn't that.
25 Q Right. So, this is consistent with that, isn't it?

17

1 A Well, let's -- let's talk about that for a minute. I
2 have mentioned aniline and bladder cancer. Aniline was used
3 and, in fact, is used today as the basis for dye stuffs.
4 Many dyes are based on aniline.
5 One of the first things that one does with aniline to
6 make dyes or one used to do was to make benzidine, which is
7 almost like dye aniline. It's two aniline molecules hooked
8 together.
9 Benzidine is a solid. Aniline is a liquid. Benzidine,
10 as it turns out, is a carcinogen. Aniline is not. But
11 Dr. Hueper and others were calling these bladder cancers
12 associated with dye production aniline cancers. Now, if we
13 had expended a great deal of time, effort, and energy
14 controlling exposures to aniline, we would have missed
15 controlling exposures of the carcinogen itself, benzene,
16 which is in a different step of the process.
17 So, in my opinion, it does help immensely to know
18 precisely what the carcinogen is, not simply that there is a
19 carcinogen present in a process, no.
20 Q Well, how did the people dealing with the aniline act?

21 What did they do to protect the workers there? Just try and
22 isolate the workers from the chemicals in the whole process?
23 A Yeah.
24 Q And did it work?
25 A No.

18

1 Q No?
2 A The -- the thought was that aniline was causing the
3 trouble. And if you run into aniline in this portion of the
4 process and downstream here you've got some benzidine that's
5 isolated and you protect these workers, these guys are still
6 going to get the bladder cancer, the ones downstream who are
7 exposed to the benzene, the true carcinogen.
8 So that you can't just throw out something at it and
9 say, "Well, we'll spend a billion dollars here and isolate
10 this whole darn process because some phase of it may cause
11 cancer." But the problem is that unless you know what the
12 carcinogen is, all you can say is that cancer is associated
13 with the production of dye.
14 But, gee, maybe it's the dyes themselves that are
15 causing the cancer. In such cases, these shouldn't leave
16 the plant and go out for things that -- clothing to be dyed,
17 for instance, for people to wear. You have got to know what
18 you have to control because we don't have unlimited
19 resources to control anything.
20 Dr. Hueper's approach is go ahead and control and
21 control and control and you never find out what's going on
22 and that's not right. It just doesn't work. And I can't
23 think of a better example than aniline and aniline cancers.

24 But another example might be the business of cigarette
25 smoke and exposures to asbestos and the fact that the two of

18

1 them go together to be more dangerous, particularly in
2 causing cancer, than either one alone. You don't find that
3 out without investigation. You don't simply say, I'm going
4 to control all exposures to asbestos down to the last gnat's
5 eyelash so that never any gets into the air; but you find
6 out that those people who smoke are the ones who are most
7 likely to get lung cancer from their exposures to asbestos.
8 And then, you have got something to beat them on the head
9 about, not only control their exposure to asbestos but to
10 control their smoking and try to in that way get at the
11 whole problem, not just a portion of it.

12 So, the more knowledge we have, the better; and I'm
13 really against -- philosophically, I'm against the idea of
14 going out and controlling for the purpose of controlling. I
15 want to know what's going on. I would say interject in this
16 process the animal experiments that are necessary to find
17 out precisely what is happening with any of the materials
18 you are running across; and once you find out with your
19 animal experiments that this is a carcinogen, which is what
20 happened with aniline, that benzidine was the carcinogen,
21 not aniline, then you can pinpoint your control and do
22 things right.

23 You may be able to bypass benzidine in the process of
24 producing the dyes and, in fact, that can be done and is
25 done all the time. You never isolate it.

1 That's a lecture. I shouldn't lecture. I'm sorry.

2 Q Well, and indeed, the evaluation through animal
3 experimentation is the first item listed in Mr. Berry's
4 memo, isn't it?

5 A It certainly is, but it is obviated by this No. 5 that
6 you go ahead and control before you know anything.

7 Q Well, what are you going to do? Are you just going to
8 wait until you have got the epistudy from 20 years later or
9 10 years later?

10 A You can get results from an animal study in six months,
11 some results, preliminary results anyway. You don't have to
12 wait for years for an epistudy. You use an epistudy along
13 with the animal work and along with industrial hygiene to
14 say that people are like rats or monkeys or guinea pigs or
15 whatever and that they also get cancer because just because
16 a rat gets cancer doesn't mean a human is or vice versa.
17 So, animal work can provide us with some answers but not
18 all, unfortunately.

19 Q Okay. So, Mr. Berry is saying in here, initiate
20 preventive measures as soon as possible?

21 A He is saying that Dr. Hueper said that. He isn't
22 saying that himself.

23 Q Okay. Fine. And then, he goes on to list five, six
24 specific suggestions or principles?

25 A Sure.

1 Q And I think have you had a chance to look at those?
2 A No.
3 Q I don't think they are much different from what you
4 have been telling me.
5 A No. They would be about what I said. These are
6 industrial hygiene principles that he is outlining. That's
7 fine.
8 Q And in Paragraph 6, as he mentioned, medical control
9 programs including following the worker throughout a latent
10 period of 15, 20 years, correct?
11 A I think that's an advisable thing, particularly when
12 one suspects cancer.
13 Q And then, some other proposals for government
14 inspection and standards and so forth that we didn't really
15 see for another 20, 25 years, correct?
16 A Yes.
17 Q Okay. And you would agree, wouldn't you, that this
18 memorandum that Mr. Berry did, again, lays out the basic
19 principles and state-of-the-art for industrial hygiene as it
20 was in 1948?
21 A As espoused by Dr. Hueper, yes.
22 Q As per Dr. Hueper? Well --
23 A But he is reporting Ed Hueper. He is not -- this isn't
24 his own stuff he is reporting.
25 Q No. But the matters reported here, the content.

18

1 A Represent state-of-the-art, yes.
2 Q Okay.
3 A They do. I'll go along with that.

4 Q All right, sir. Now, we've got Mr. -- Dr. Fishbein's
5 1949 editorial that Mr. Taylor was mentioning. Is this
6 something you have seen before, sir?

7 A I'm sure it is, if I can open it up. Well, this is
8 part of an editorial, anyway. "Asbestosis and Cancer of the
9 Lung," that's what you referred to?

10 Q Yes, sir.

11 A And I've talked about this, too, that those people who
12 believed that asbestos could cause cancer felt you had to
13 get asbestosis first and that that lead to the cancer and,
14 therefore, if you could prevent the asbestosis, you would
15 prevent the cancer.

16 Q And the reasons that we are -- at that time, 1949 and
17 earlier, we were discussing asbestosis and cancer of the
18 lung had to do with, what, the intensity of the exposures
19 that would have been prevalent at that time --

20 A Why, sure, of course.

21 Q -- sufficient to cause asbestosis within -- before the
22 man developed lung cancer?

23 A Well, nobody, even Dr. Fishbein, said that lung cancer
24 was a necessary sequelae of asbestosis. What they were
25 saying is that if you have got a good case of asbestosis,

18

1 your chance -- your chance of having lung cancer is
2 increased quite a lot. That's fine. I -- there is nothing
3 wrong with that. It's a good conclusion to draw.

4 But as an industrial hygienist, my job is to prevent
5 the asbestosis in the first place. I don't care whether it
6 will cause lung cancer if you get asbestosis, if I can

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7 prevent the asbestosis.

8 MR. TAYLOR: And, Joe, just for the record, this
9 is the -- this is the Hueper editorial. It's -- Fishbein is
10 --

11 MR. BLANKS: Sure.

12 MR. TAYLOR: This is Hueper's editorial. Fishbein
13 is just the editor of the journal. He didn't write this
14 particular editorial. He says -- my understanding is this
15 is one that was written by Wilhelm Hueper in '49. So that
16 is the one I was referring to.

17 MR. BLANKS: Well, okay.

18 MR. TAYLOR: I mean, Fishbein is the editor of the
19 journal; but he is not, as I understand it, generally
20 regarded as the author of the editorial in '49 on
21 "Asbestosis and Cancer of the Lung." I think it's
22 generally regarded that Hueper wrote this, but we can let
23 the experts talk about that.

24 MR. BLANKS: Who is more expert than we?

25 MR. TAYLOR: What do you mean?

18

1 MR. BLANKS: Well, I am not here to argue that
2 with you one way or the other.

3 A It's immaterial for our purposes, anyway. We don't
4 care who wrote it. I don't care.

5 Q (By Mr. Blanks) Well, that's true. We know that there
6 the Journal of American Medical Association in August, 1949,
7 Volume 140, among other things, did discuss cases reported
8 of asbestosis and cancer of the lung from the US and Germany
9 and elsewhere.

10 A Yes.

11 Q Did you ever make the acquaintance of Charlie Hine from
12 Shell?

13 A Yeah. In fact, I have almost got embroiled in a joint
14 consulting effort with Charlie Hine. It never worked out
15 that way. We did talk on the phone a couple of times, once
16 I was able to get through to him, which is a very difficult
17 thing to do; but we never got together in person to work on
18 the project, whatever it was. And I've forgotten what it
19 was now.

20 Q A long time ago?

21 A A long time ago. 20 years, maybe.

22 Q Did you meet him at the AIHA activities?

23 A I may well have because I have a picture in my mind of
24 what he looks like. And so, I probably had met him; but I
25 couldn't say when or what the circumstances were.

18

1 Q Well, let me share with you a little piece of work that
2 Dr. Hine did under the letterhead of Shell Development
3 Company in April of 1950, our Exhibit 500428 SHEL, and ask
4 you if you have ever laid eyes on that before.

5 A No. I have never seen this.

6 Q The title of this is "Certain Problems of Environmental
7 Cancer in the Petroleum Industry."

8 A Yes. And I have not seen this.

9 Q This will -- just to satisfy your curiosity, why don't
10 you flip over to the last page, which has Table 2 on it,
11 Page 2.

12 A Uh-huh.

13 Q And do you see down where he talks about lungs,
14 pneumoconioses as a precancerous lesion with asbestosis?
15 A This -- this was the thought at the time.
16 Q All right.
17 A That's fine. In fact, it's the thought of many
18 today --
19 Q Yeah.
20 A -- that lung cancer is associated with asbestosis, not
21 with the minor exposures that may result in mesothelioma.
22 Q And, again, shows the etiological agent or causative
23 agent is asbestos over in the right column?
24 A Yes.
25 Q So, this work by Dr. Hine, which was also sent around

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1 like Dr. Berry's memo to the members of the American
2 Petroleum Institute, seems to you to be what you would
3 expect to find from toxicologists looking at these issues
4 during the 1950 era?
5 A Yes.
6 Q Let me -- well, I thought this was from your AIHA
7 quarterly. I don't have that one. This is actually a
8 publication from 1954, "Current Safety Topics in the
9 Petroleum Industry as Presented in Sections of the Petroleum
10 Section of the 42nd National Safety Congress."
11 Now, that -- the National Safety Congress would be the
12 name of the annual meeting such as you once attended
13 somewhere along the way?
14 A Yes.
15 Q Okay. Did you ever meet a gentleman named Art Pabst

16 from Socony or Mobil?

17 A No. I don't believe so.

18 Q Okay. Well, let me share with you Mr. Pabst's article
19 or paper as presented at the National Safety Congress
20 entitled "Industrial Hygiene in the Petroleum Industry"; and
21 I know Dow wasn't, strictly speaking, in the petroleum
22 industry.

23 A No. Dow was not in the petroleum industry at all.

24 Q Except peripherally through Dow Well Company?

25 A Yes.

18

1 Q But in many respects the -- from an industrial
2 hygienist's standpoint, the plants, the refinery is not
3 extremely dissimilar from a chemical plant, is it?

4 A Oh, no, not at all. The person who isn't aware of
5 what's going on would be hard put to distinguish one from
6 the other simply by walking by or driving by or whatever.

7 Q Hey, and let me ask you to -- take your time, but if
8 you want to flip over there -- well, just take your time.
9 This is a great article by Art Pabst.

10 A It is a good explanation of industrial hygienists and
11 safety people. It really is. He did a good job.

12 Q Okay. You ought to see the Van Hendricks article he
13 knocked it off from.

14 A That doesn't surprise me, either.

15 Q I'm sorry. I don't have that one with me.

16 A Oh, for shame.

17 Q I'll send it to you. But, once again, we see a
18 discussion of safety departments, hygiene, medical

19 departments, toxicology issues, means of exposures, same
20 kind of problems that you and your colleagues were dealing
21 with at Dow in the 1950's, correct?

22 A Sure. Absolutely.

23 Q If you look over there onto -- well --

24 A I can't read the page.

25 Q It's the page where the yellow flag is tabbed, I

19

1 think.

2 A The page before this. We were having a little
3 discussion of toxicity and toxic. I notice that he lists
4 asbestos as a respiratory irritant and not a toxic material.

5 Q Different semantics, isn't it?

6 A It's semantics. That's right. And it's how one is
7 using the term and when and where. That's fine.

8 Q Well, let's look on that page there. Mr. Pabst lists,
9 "A few of the materials commonly encountered in the
10 petroleum industry are listed below." He has got gases and
11 vapors. We see about eight or nine items there.

12 A Yes.

13 Q And would I be right in thinking that many, if not all
14 of those, you might encounter in a chemical plant, as well?

15 A Absolutely.

16 Q And then --

17 A With the possible exception of octane.

18 Q Yeah. I thought that myself.

19 A When -- well, you encounter gasoline, obviously, but
20 not octane.

21 Q Octane is what? That's not the tetraethyl lead stuff,

22 is it?

23 A No. No. No. Octane -- there are two ways the word is
24 used. One is for the normal octane, which is a straight
25 chain aliphatic hydrocarbon containing eight carbon atoms.

19

1 That's where the "oct" comes from.

2 The other one refers to isooctane, which is -- it has
3 eight carbon atoms, but it's branched. And isooctane has an
4 octane rating of 100 in an engine. Octane itself has a
5 rating of close to zero. It pings very easily.

6 Q And then, in addition to -- thank you.

7 A I have a fund of useless information.

8 Q As I have, perhaps, a fund of useless questions, they
9 might say.

10 A I wouldn't say a thing like that, Joe.

11 Q Thank you. Mr. Pabst also lists toxic dust fumes and
12 mists and this shows --

13 A This is from a TLV list. That's the way he took this
14 thing, yes.

15 Q Okay. And then, under mineral dust, he lists asbestos,
16 correct?

17 A Yes.

18 Q And "nuisance dust" meaning that without any free
19 silica in it?

20 A Yeah. Well, actually, it was less than five percent
21 but that's good.

22 Q Okay. And then silica?

23 A Yeah.

24 Q And would you think that as well as being commonly

25 found in the petroleum industry, these materials would also

19

1 be commonly encountered in chemical plants in the mid
2 1950's?

3 A In the same way they would be encountered in the
4 petroleum industry, yes.

5 Q All right, sir. And, regrettably, we don't have
6 Mr. Van Hendricks.

7 A That's a name that's familiar to me, but I don't know
8 why.

9 Q It's Nathan Van Hendricks; and he was Standard Oil of
10 New Jersey, later Exxon.

11 A Okay. I -- I met him in that position. I was
12 introduced to him by Dick Brief or somebody, but I worked
13 with him.

14 Q You surely would have run into him at the AIHA meetings
15 somewhere along the way?

16 A Sure. Undoubtedly.

17 Q Okay. At any rate, I don't suppose you remember having
18 seen Mr. Pabst's paper before I've handed it to you today?

19 A No. Never.

20 MR. TAYLOR: I would like to get that marked as an
21 exhibit, if we could.

22 MR. BEASON: Oh, you would?

23 MR. TAYLOR: Yes.

24 MR. BLANKS: Well, give it here.

25 MR. TAYLOR: Thank you.

1 MR. BLANKS: Let's see. Well, as it is now, this
2 is marked as 540000 NSC. Although, out of fairness to
3 Mobil, we probably should label it here 540000 MOBI.

4 (Marked Exhibit No. 540000 MOBI and is attached
5 hereto.)

6 Q (By Mr. Blanks) Well, let's visit this question of
7 toxic and toxicity. I know you have just been anxious to
8 clarify that for me. So, tell me what you mean when you use
9 the word "toxic" and when you speak of "toxicity."

10 A I prefer to define "toxicity" rather than "toxic."

11 Q All right.

12 A "Toxicity" is a property of matter. It is a property
13 of matter in much the same way that mass is a property of
14 matter, in that each is an extrinsic property of matter,
15 which simply means that the expression of mass or of
16 toxicity depends upon how much of the stuff you've got.

17 In toxicity, it's how much you get in the body. In
18 mass, it's how much you can weigh, if you will, or
19 determining the inertia of or whatever.

20 Toxicity is the ability of the material to injure a
21 living organism by other than mechanical means. Now, if
22 you'd get a copy of my book, you would find that in there in
23 those words.

24 Q I promise. I'm going to buy the book. Every used
25 bookstore I go into, I look for your book; but it's so

1 popular, nobody gets rid of it.

2 A That's right. You might find it from one of Jim
3 Hammond's former students perhaps. He used it in his
4 teaching.
5 Q Okay. The ability to injure an organism --
6 A A living organism.
7 Q -- by other than mechanical means?
8 A Yes.
9 Q Now, for a while it was thought that the asbestos
10 fibers inhaled into the lung injured the body via mechanical
11 means, am I right?
12 A That's correct. Absolutely. In fact, there are people
13 who say that today; but that's -- that's part of the process
14 of injury.
15 Q Okay. But our knowledge has gone beyond that idea,
16 hasn't it, by --
17 A But it goes beyond it and comes back. We don't know
18 today how asbestos causes cancer. We don't. We don't know
19 how it causes -- well, we have an idea about asbestosis; and
20 that's probably the mechanical injury more than anything
21 else.
22 Q Okay. So, if we don't believe that asbestos acts on
23 the body by some means other than mechanical means then, by
24 your definition, it would not have toxicity?
25 A Right.

19

1 Q Okay. Now, from the way you've talked today and
2 before, I suppose you would say that any substance has
3 toxicity if you do something with enough of it?
4 A If you get enough of it. You can kill yourself by

5 drinking water, if you want to do so.

6 Q Can you really?

7 A Yes, you can.

8 Q How do you --

9 A About 20 years ago -- what happens, if you eat nothing,
10 just drink water, lots of water, as much as you can hold all
11 the time, you wash the electrolytes out of your body and you
12 die.

13 Q Well, what if you eat and drink as much water as you
14 can drink?

15 A Then you get electrolytes.

16 Q Sir?

17 A If you eat, you get electrolytes. Then, you replace
18 what you are trying to wash out with the drinking.

19 Q Okay.

20 A But there were cases about 20 years ago, two cases in
21 England of people who committed suicide by eating nothing
22 and drinking water, lots of water. A horrible way to die.
23 But, nevertheless, it was done; and it can be done.
24 Everything is toxic. Everything.

25 Q So, if the word applies to everything, then what good

19

1 is the word to us in describing the materials that
2 industrial hygienist need to control?

3 A An industrial hygienist may need to control anything or
4 everything. If people are getting too much of whatever it
5 is, it's the industrial hygienist's job to control it.
6 Industrial hygienists work with hazard, which is the
7 likelihood of injury.

8 Toxicologists work with this property of toxicity.

9 They determine the toxicity of materials, the extent to
10 which they are toxic.

11 Industrial hygienists determine the hazard of the
12 materials, the likelihood of injury from exposure to the
13 stuff, and then try to figure out ways of controlling the
14 exposure so that the injury does not occur.

15 Q Well, now, does the word, the adjective "toxic" have
16 any meaning for you?

17 A Just as a component of toxicity. It's the adjective
18 for the noun "toxicity," yes.

19 Q So, does it mean anything to talk of a material as
20 being toxic?

21 A No.

22 Q No?

23 A No. That's -- it's like people talk about heavy metal
24 toxicity. What is a heavy metal?

25 Q It's a band, isn't it?

19

1 A It's a meaningless term. It's a band, yeah. But it's
2 a meaningless term because what they are talking about is
3 the toxicity of metals. I don't care whether they are heavy
4 or not. How do you define heavy? Is it heavy to feel in
5 your hand? Does it have a high atomic weight? What do they
6 mean by heavy? They don't ever say. So that it's a
7 meaningless term. Just as a toxic metal, it's a meaningless
8 term because all metals can be toxic under the right
9 circumstances or the wrong circumstances.

10 Q Okay. So, when you visit with your toxicologist about

11 the toxicity of a material, what you want to know is what?

12 How much of it it takes to have an effect?

13 A Yes. And what effect we are talking about. And we
14 talk about LD 50's, the lethal dose in 50 percent of the
15 animals. We talk about LC 50's, for a certain exposure that
16 was a lethal concentration that would kill 50 percent of the
17 animals in so many hours. We talk about LD 0's and LD 99's
18 and LD 1's and so forth.

19 These are quantitative expressions of toxicity, and
20 each is useful in its own right. And we can use this kind
21 of information, "we" being industrial hygienists, to help us
22 decide how we are going to control this stuff, whatever it
23 may be.

24 For instance, we can use data developed on oral
25 exposure, whether it's acute exposure or chronic exposure,

19

1 of materials that are solids to predict the toxicity of that
2 material from inhalation because if the stuff is big enough
3 to see and you inhale it, it winds up in your stomach just
4 as if you had chewed it. So, the oral route with the
5 animals tells us quite a lot about the inhalation route of
6 some kinds of materials for people.

7 And I heard on the radio as I was coming down here
8 today that a couple of governmental agencies have decided
9 they are no longer going to go to animal experiments, which
10 I think is the most ridiculous thing in the world. There
11 are things that animals can tell us that you can't develop
12 with a computer program, which is what they are talking
13 about using instead.

14 Q Animal rights, huh?

15 A Yeah. That's right.

16 Q Okay. Now --

17 A I told you I was a toxicologist. You tapped the wrong
18 drum.

19 Q I guess so. So, in assessing the likelihood of injury
20 from an exposure, what do you do with the toxicity
21 information?

22 A Well, suppose that the exposure we are talking about is
23 an exposure to aniline. We measure the exposure that people
24 have, and we compare that to the exposure that will cause
25 injury. And if the exposure is greater than that that we

19

1 know can cause injury to animals, we say, "Hey, these people
2 might be injured, too." And we do our best to control
3 exposures to well below those that can cause injury.

4 The complication in this whole thing is when we talk
5 about acute and subacute and chronic exposures; and it is
6 far more difficult to evaluate chronic exposures and the
7 concentrations that cause injury upon chronic exposure than
8 it is for acute exposures, meaning short term or single
9 dose.

10 Q Okay. All that sounds good in principle. Now, how do
11 we relate that to the problem we are here on today?

12 A Well, the fact of the matter is that our first
13 information about the ability of asbestos to cause injury,
14 the first quantitative information we have was developed in
15 animal experiments. So that we could use that kind of
16 information to help tell us that this stuff can do this sort

17 of thing.

18 The epidemiology, as exemplified by the Dreessen
19 report, "Epidemiology and Industrial Hygiene," told us what
20 kind of exposures can cause that kind of injury. I mean,
21 theoretically, that's the way one can do it.

22 Of course, we knew that overexposure to asbestos can
23 cause asbestosis well before the Dreessen study was done;
24 but animal work could have done exactly the same thing
25 without exposing people at all. So, that's the ideal way to

20

1 do it. Do the animal work first and then know what you are
2 trying to control.

3 Q Well, isn't that what Owens Illinois was having done
4 with Kaylo up at Saranac?

5 A Yes, sir.

6 Q Was the animal work to try and determine the potential
7 for harm in a living organism?

8 A Yes, sir, it was.

9 Q And I gather you are acquainted now with some of that
10 work?

11 A Oh, sure. Sure.

12 Q While we are talking about Kaylo, one of my favorite
13 subjects, --

14 A I'm sure.

15 Q -- do you -- well, I know you didn't do any Kaylo
16 surveys at Dow, did you?

17 A No.

18 Q Have you seen papers indicating that such was done up
19 there?

20 A After I left Dow, yes.
21 Q Okay. Now, the approach that you used in -- in
22 assessing a hazard from asbestos exposure was to use a TLV
23 of 5 million particles per cubic foot of asbestos?
24 A Well, that was the TLV.
25 Q All right.

20

1 A Well, what I -- any time you sample for particulate
2 material in the air, you sample all particles. You can't
3 sample just fibers or just asbestos or just cotton or just
4 sand. You sample everything that's there. And then, if
5 your exposure, the concentration that people are exposed to
6 is in excess of, say, 5 million particles per cubic foot,
7 then you start worrying about what fraction of that is
8 asbestos and whether or not the asbestos TLV has been
9 exceeded; but if the exposures are below 5, you know very
10 well the asbestos TLV can't possibly have been exceeded.
11 So, you don't have to go to all the work of analyzing
12 particularly for asbestos or even finding out what fraction
13 of the sample is asbestos if you are well below 5 million
14 particles per cubic foot.
15 Q Well, okay. I heard that. Now, at Dow, when the
16 hygienist would go out and do a survey and report on it and
17 report a certain concentration level, was he using this
18 approach that you say was the rule, that is, to say that
19 I've sampled and I have got 4 million particles per cubic
20 foot of asbestos?
21 A No.
22 Q He is just reporting on total dust measured?

23 A Total dust, that's right.

24 Q Well, then, how does he ever get to the point of
25 knowing what he has got in the way of asbestos?

20

1 A He doesn't. He doesn't have to.

2 Q What if he is over 5 million parts? Then what?

3 A Oh, then -- then, he has to go to the work of finding
4 what fraction of it is asbestos.

5 Q And how does he go about doing that?

6 A There is only one way to do it under circumstances
7 similar to those that I did the asbestos sampling at Dow;
8 and that is to set up a high volume sampler, sample enough
9 air so that I can find out what the fraction of asbestos is
10 in the particles that are collected with my high volume
11 sample, and say that the chances are that that fraction
12 would apply to the breathing zone sample I took of the
13 gentleman in question.

14 Q So, you've got a chance to go -- once you've got a
15 sample taken consistent with the TLV standards and it's at
16 the limit or it's beyond the limit, then you would go and
17 try somehow to figure out how much of it was asbestos?

18 A Yes, sir.

19 Q And you do this with, what, electronic microscopes; or,
20 I mean, how in the 1950's would you do this analysis?

21 A Oh, that's -- that's easy, even in the '50s. With this
22 high volume sampler, we can get enough sample so that we can
23 take it to an x-ray diffraction lab and say, "Tell me: How
24 much of this is asbestos and what kind of asbestos is it?"
25 And we had x-ray diffraction going at Dow when I was there

1 and well before I was there. You can actually do it with
2 wet chemical methods, too; but it's a very long, laborious
3 procedure.

4 The fact of the matter is that asbestos is resistant to
5 just about every technique we use. We can try and burn the
6 stuff and it would burn away all the organic and you are
7 left with asbestos.

8 Q Well, now, when Mr. Dreessen did his report, this
9 epistudy you have referred to, that was, what, 1936?

10 A It was published in '38.

11 Q Okay. And done in --

12 A Some preceding time.

13 Q All right. Published in 1938. He didn't have this
14 x-ray spectrometry available to sort out the asbestos
15 fibers, did he?

16 A No. In the first place, he wasn't looking for fibers.
17 He was looking for particles, all particles, including
18 fibers.

19 In the second place, yes, he did have a high volume
20 sampler there. In fact, there is a picture of it in one of
21 the first pages of the report.

22 Q Yeah.

23 A And what he did with those samples was to burn them,
24 and the idea being that the dust in that kind of a plant
25 consisted either of asbestos or cotton. The cotton would

1 burn. The asbestos wouldn't.

2 So, when I burned it or when he burned it, he not only
3 wound up with ash; but he knew that he was getting rid of
4 the two molecules of water that are coincident with
5 chrysotile asbestosis so that he could sit down and
6 calculate, if he wished, the concentration of asbestos in
7 the air. And it turns out that the average for his samples,
8 excluding the one that's got a lot of oil in it, is about 90
9 percent asbestos.

10 Q This is what he reports in his paper?

11 A He doesn't report the 90 percent, but he reports the
12 data from which one can calculate the 90 percent. It's in
13 Table 3 or something like that or 12. I don't remember.

14 MR. TAYLOR: I can probably find it for you.

15 A But he didn't use x-ray diffraction. Instead, he
16 simply did the easy thing and burned the samples, ignited
17 them is what they -- the term that he used.

18 Q (By Mr. Blanks) So, you are saying that the number he
19 comes up with, this 5 million, is net of any other fiber or
20 particle or anything else in there?

21 A No. It's total particles in a plant where 90 percent
22 of the dust is asbestos, and believe me --

23 Q You are taking me in circles now. I mean, he reports 5
24 million total -- 5 million particles of total dust.

25 A In air where the particles are 90 percent asbestos

20

1 particles.

2 Q Well, how do you get to that last step?

3 A By means of the ignition samples that he has. You can
4 calculate. He must or DallaValle, his industrial hygienist,
5 must have done the calculation because they, in essence,
6 said, "Look, what we are sampling is, in essence, pure
7 asbestos, even though we know there is around 10 percent
8 cotton." He knew there was 10 percent cotton not only from
9 the input to the plant where they use the cotton fiber as a
10 basis to make the fabric, the textile, the asbestos textile,
11 but also because of his high volume air samples that were
12 ignited. And they show that there was 90 percent asbestos
13 in the air, as well.

14 And the slop we have in industrial hygiene is far
15 greater than plus or minus 10 percent in any samples we
16 take. So that this is saying, if we say it's 100 percent
17 asbestos, we aren't going to be far away.

18 Why don't you hand it to me. I'll find it.

19 Q Yes.

20 A It's near the front of the paper. There is a picture
21 of his high volume sampler.

22 Q Vacuum cleaner bag arrangement for collecting suspended
23 dust samples.

24 A Yes. And this is why it was used. It wasn't used to
25 determine concentration people were breathing. It was used

20

1 to get enough of the stuff in the vacuum cleaner bag so they
2 could weigh it and ignite it and reweigh it.

3 Q And you are satisfied this vacuum bag here captured the
4 small asbestos particles? They didn't just go blowing on
5 through it like you know they do?

6 A No. In fact, it probably did a better job than the
7 impingers did on collecting the asbestos particles. A
8 filter bag - chemical engineers learned this; and I'm,
9 basically, a chemical engineer who went wrong - becomes a
10 better and better filter. That is, it's more and more
11 efficient as you collect more and more dust because the dust
12 itself becomes a filter for further dust. So that a bag
13 filter can approach 100 percent efficiency.

14 Yes. Here are the tables. They are on Page 20 where
15 they talk about loss on ignition and so forth.

16 Q And so, from this you get your 90 percent somewhere?

17 A Yes. That's right.

18 Q I sure don't see it in there.

19 A No. No. You don't see it. It was never calculated
20 and presented in the paper. This was standard industrial
21 hygiene techniques. It's like you don't learn how to spell
22 words when you become a lawyer. You are expected to know
23 this. Industrial hygienists were expected to know this kind
24 of thing, too. It's just one of those things that was part
25 of industrial hygiene. Nowhere --

20

1 Q Okay.

2 A Nowhere in the paper is that high volume sampler
3 discussed, nowhere, and how it's used.

4 Q Well, then, how do you know about it?

5 A It's right here. Because this is a standard
6 technique. This is the way industrial hygienists did
7 things.

8 And he also talked about collecting samples from

9 horizontal surfaces, rafter samples. This is also a
10 standard industrial hygiene technique to find out what was
11 in the air.
12 Q Well, let's see. Table 2 has got chemical analyses of
13 settled dust samples.
14 A That's the rafter samples that I'm talking about.
15 Q And then, Table 3 is chemical analysis of suspended
16 dust samples.
17 A Right. Those are the ones taken by the high volume
18 technique, that vacuum cleaner.
19 Q Now, how -- and then you have got these numbers. These
20 are the -- this is what is left after you have --
21 A After you have ignited it.
22 Q -- ignited?
23 A That's right.
24 Q So much ash?
25 A That's the operative thing is the ash because that

20

1 contains all the rest of the stuff.
2 Q Silicon dioxide?
3 A Yes.
4 Q Where does that -- where does that come from? Where
5 does the silicon dioxide come from?
6 A Asbestos -- chrysotile asbestos is a hydrated magnesium
7 silicate. When you burn it, you wind up with silicon, which
8 is expressed in tables such as this as SiO_2 . Magnesium is
9 expressed as MgO and so forth. Aluminum is expressed as
10 Al_2O_3 .
11 Q So, what, are these five columns of compounds --

12 A Those don't count.

13 Q -- or what?

14 A Yes. They are -- they are simply showing that it's
15 asbestos, that this is -- has its source of asbestos. What
16 really counts is the total ash from which all these other
17 things come. So, you look at the ash; and you find that the
18 ash is, what, around 87 percent, 85 percent, something on
19 this order. I've forgotten the exact numbers.

20 The weight of the water that was driven off as a
21 function of the water crystallization of the magnesium
22 silicate to form asbestos is something like -- oh, I've
23 forgotten these numbers. At any rate, you add that in to
24 the ash; and you wind up with 80 percent or 90 percent for
25 most of the samples. There is one that is contaminated with

20

1 oil that you have to throw out.

2 Q Well, he talks about a 30 percent loss on ignition.

3 A Uh-huh. Let me see the table, please. I -- it's been
4 a long time since I have gone through this calculation.
5 What I did was to average the percentages of ash, leaving
6 out that one sample that was taken in the area where there
7 was a lot of oil because they were trying to suppress dust
8 formation with oil. And you add these things up; and they
9 come out around 75 percent, something like this, 75 or 77
10 percent. And the loss on ignition of water vapor is 13
11 percent. So, you add that to the 76 percent; and you get 89
12 or 90 percent is the loss on ignition, which means --

13 Q So what -- yeah.

14 A -- which means that's the asbestos content of these

15 samples, on the average.

16 Q Well, how --

17 A Honest.

18 MR. ALMQUIST: I think, Mr. Blanks, that you may
19 want to think about that a little bit longer. We've now
20 reached the 5:00 hour here, and so I think --

21 MR. BLANKS: Okay. Do you want to take a little
22 break?

23 MR. ALMQUIST: No. I think we are through for the
24 day.

25 MR. BLANKS: Well, we want to go on a little bit.

21

1 We can get done here.

2 MR. ALMQUIST: No. We're through for the day.

3 MR. BLANKS: Well, no --

4 MR. ALMQUIST: I'm not going to subject him to --
5 Joe, we stopped last time for you at 3:45.

6 MR. BLANKS: Well, now, wait a minute. Wait a
7 minute. Let's talk to Dr. Peterson here.

8 Can you carry on a little bit so we can get done, sir?

9 MR. ALMQUIST: Joe, the Texas Supreme Court is on
10 the verge of adopting a six-hour total deposition.

11 MR. BLANKS: Well, they haven't yet.

12 MR. ALMQUIST: We have been going six hours
13 today. I'm not going to subject the witness to more than
14 six hours. Now, we went -- last time, we had six hours of
15 testimony; and we've actually been here since 9:30 this
16 morning. It's now -- well, it started at 9:00. We had to
17 move rooms. The deposition actually began at 9:30. It's

18 now 5:00, and that is --

19 MR. BLANKS: Well --

20 MR. ALMQUIST: I'm sorry; but I think that, you
21 know, is imposing upon a witness.

22 MR. BLANKS: Well, you are talking. But, I mean,
23 the witness is the one to say. If he is willing to stay
24 another 20 or 30 minutes so we can get done and I won't have
25 to come back and bother him again, then I think we ought to

21

1 do that.

2 MR. ALMQUIST: There are other attorneys who have
3 questions of this witness. Are you then going to have to go
4 back and reevaluate 20, 30 minutes after you think you are
5 going to be through, whether they have questions, however
6 long that lasts?

7 MR. BLANKS: Well --

8 MR. ALMQUIST: I am sorry, but that is not fair to
9 the witness and is not the way I operate. You have known
10 this before in other depositions. I'm not going to drag
11 somebody on all day.

12 MR. BLANKS: Well, you are not dragging anybody.
13 Dr. Peterson, I drug him here and I appreciate your thoughts
14 but you are just consuming our time. And if he is willing
15 to stay a little longer in the hopes of getting done, then I
16 think he'd probably want to do that.

17 THE WITNESS: Mr. Blanks, I have done this for
18 plaintiff attorneys several times in the past who have
19 promised 20 or 30 minutes; and it's always wound up to be an
20 hour and a half or two hours. I can't do that.

21 MR. BLANKS: Well, I'm not going to do you an hour
22 and a half. I promise you that.

23 MR. TAYLOR: There is your answer. I mean, I
24 think he has declined to proceed and --

25 MR. BLANKS: Well, I -- now, you all be quiet a

21

1 minute now. I am going to ask you to stay so we can get
2 done. Otherwise, we are going to have to adjourn and come
3 back and I don't want to do that and I don't know whether
4 you want to or not but you probably don't. I'm really sorry
5 we got into this long digression on Dreessen here, but I'd
6 invite you to give us a chance to wrap up and --

7 MR. ALMQUIST: I have been through those --

8 MR. BLANKS: Let him answer me instead of your
9 speech and Tom's speech because, I mean, that's -- that's
10 where we are going to go. If we don't get done --

11 THE WITNESS: I'm disinclined to go further. I'm
12 tired. I've been fighting a cold for a couple of weeks.
13 I'm getting over it, but I would rather not push myself any
14 harder than I have been pushed already.

15 MR. BLANKS: Would you be willing to give these
16 other people a chance to just ask you any questions they
17 might have? While we are talking, as you can see, I am
18 flipping through my stuff and making sure that we have
19 pretty well covered everything that I need to cover. And,
20 indeed, we have. Though, we haven't talked about your books
21 that you brought; but I want to cover that. And then, I'll
22 pass the witness and let everybody have a chance at you.
23 And I'll bet you they don't take much of it. Would you be

24 willing to give that a try?

25 MR. TAYLOR: I'm sorry. I'm not understanding.

21

1 Are you passing or not right now? Are you done?

2 MR. BLANKS: I want to ask to ask -- I want to ask
3 -- if the doctor will stay with us and let us finish, I
4 want to ask us a couple of questions about the papers he
5 brought; and then, I'm passing. That's all I've got. So,
6 I've got -- first, I've got a question to you. Would you be
7 willing to give that a try in hopes we can get done in truly
8 within the 30 minutes or 20 minutes?

9 THE WITNESS: Where do we watch the guillotine
10 drop or guillotine?

11 MR. BLANKS: You're -- well, I guess, you know, I
12 don't have a gun; and I'm not going to scream at you. I
13 mean, I guess you can get up and walk out.

14 THE WITNESS: Well, I know I could do that. I
15 don't want to be obstreperous. I really don't have anything
16 to say about these papers. They are published.

17 MR. BLANKS: Well --

18 THE WITNESS: I don't know, Joe. I -- as I said,
19 I am tired. My voice is tired. My throat is tired.
20 Although, it's not sore; and it was sore when I got here
21 this morning. It's been sore for the last week. I am
22 getting better, but I'm not over it. One can hear that in
23 my voice. I just -- I would rather not. I'm sorry. I
24 really would rather not.

25 MR. BLANKS: Well, I'll pass the witness and give

1 you all an opportunity to cross-examine.

2 MR. ALMQUIST: Well, again, with the
3 cross-examination --

4 MR. BLANKS: Is there any cross-examination?

5 MR. ALMQUIST: Yeah. There are some questions I
6 will have to ask.

7 MR. JONES: I don't have anything.

8 MR. BLANKS: Is there anything from anybody else
9 present? I hear nothing. I hear nothing from anyone but
10 Mr. Dow.

11 MR. ALMQUIST: I have some questions I'm going to
12 ask this witness. If I'm going to ask him questions, it's
13 going to take me a while to ask questions.

14 MR. BLANKS: Well, okay.

15 MR. TAYLOR: Well, then, it sounds like it's the
16 same rule for everyone and --

17 MR. BLANKS: And then --

18 MR. TAYLOR: -- I would say we are coming back, it
19 sounds like, because if, you know, he is not going to go
20 past 5:00 for you, he is certainly not going to go past 5:00
21 for Dow. He is not going to go past 5:00 for us. I don't
22 blame him. So, I think we are done for the day; and we will
23 come back another time.

24 MR. BLANKS: All right. No. The situation now
25 is: I pass the witness. Dow wants to ask you a few

1 questions. You probably know what they are. There are
2 probably not many. Do you prefer to stay and be done with
3 us here? I don't -- I can't speak for Mr. Almqvist.

4 THE WITNESS: I would -- what I would prefer is
5 being able to answer all of your questions.

6 MR. BLANKS: I'm done. You have done me a good
7 job and --

8 THE WITNESS: If you know you are done --

9 MR. BLANKS: Well, I'm done. Now, if he does
10 something on his redirect, well, then, we may have to come
11 back. You know that. But, I mean, I want to be done as
12 well as you do, as much as I love your city; and I enjoy
13 your company. So -- but we've been talking now for about 15
14 minutes to no avail. So, if --

15 MR. ALMQUIST: I think I need a minute break. I
16 want to talk to some of the other attorneys and see if they
17 anticipate any questions and stuff.

18 MR. BLANKS: Well, the only other --

19 MR. TAYLOR: Off the record.

20 MR. ALMQUIST: Off the record.

21 MR. BLANKS: All right.

22 (After the break, the proceedings continued as
23 follows:)

24 MR. ALMQUIST: None of our attorneys have any
25 questions, and none of the other attorneys have any

21

1 questions. So, the depo -- that's it.

2 MR. BLANKS: Can we put on the record before you
3 pack up what you brought with you today, and then -- I'm not

4 going to take them but --

5 THE WITNESS: Do you want me to copy anything for
6 you?

7 MR. BLANKS: You know, I probably have most of
8 this anyway.

9 THE WITNESS: You probably do.

10 MR. BLANKS: So, probably not.

11 THE WITNESS: Yeah. Okay.

12 MR. BLANKS: But I appreciate the offer. Just
13 wrapping up for the record, Dr. Peterson was kind enough to
14 bring today some of his personal library, including, in
15 particular, bound copies of the "American Industrial Hygiene
16 Association Journal," Volumes 17 through 18, years 1956
17 through 1957, and Volumes 19 through 20 for years '58 and
18 '59; the second revised edition of Patty's "Industrial
19 Hygiene and Toxicology" from years 1950 -- from the year
20 1958, and that's in multiple volumes, I believe; and some
21 AIHA Journals from '62, '63, Volumes 23 and 24, '64 and --
22 1964 and '65, Volumes 25 and 26. All of them filched, by
23 the way from -- no doubt withdrawn from circulation of some
24 college library.

25 THE WITNESS: No. They were my volumes that were

21

1 put in our library.

2 MR. BLANKS: I see. And Stern on air pollution.

3 THE WITNESS: Three volumes there.

4 MR. BLANKS: Oh, I thought it was three copies of
5 the same book.

6 THE WITNESS: No. Three volumes. Volumes 1, 2,

7 and 3.

8 MR. BLANKS: Three volumes from 1968, the AIHA
9 Journal, Volumes 21 through 22; 1960 through '61; and did
10 you get Dr. Peterson's comment that the AIHA Journals, at
11 least, were bound copies of his personal AIHA Journals from
12 those early years, which I gather you had put in the library
13 at the college library?

14 THE WITNESS: In market.

15 MR. BLANKS: Market, yes, for our use, which they
16 gave you when you departed for your own keepsake?

17 THE WITNESS: They did.

18 MR. BLANKS: Okay. Thank you, sir.

19 THE WITNESS: My pleasure.

20 (Proceedings concluded.)

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1 WITNESS CERTIFICATE

2 STATE OF *

3 COUNTY OF *

4 I, JACK E. PETERSON, P.E., Ph.D., do hereby certify
5 that I have read the foregoing transcript of my videotaped
6 testimony given in the foregoing numbered and styled cause
7 and that same is true and correct to the best of my
8 knowledge and belief with the exception of the following
9 corrections by page and line number:

7 PAGE/LINE _____ CORRECTION _____
8 REASON FOR CORRECTION _____
9 PAGE/LINE _____ CORRECTION _____
REASON FOR CORRECTION _____
PAGE/LINE _____ CORRECTION _____

10 REASON FOR CORRECTION
PAGE/LINE _____ CORRECTION _____
11 REASON FOR CORRECTION
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19 REASON FOR CORRECTION
PAGE/LINE _____ CORRECTION _____
20 REASON FOR CORRECTION
PAGE/LINE _____ CORRECTION _____
21 REASON FOR CORRECTION _____

22 _____
23 JACK E. PETERSON, P.E., Ph.D.
24 Sworn to and subscribed before me on this _____ day
of _____, 1996.
25 Notary Public for the State of _____

21

1 STATE OF TEXAS:
2 COUNTY OF ANGELINA:
3

4 I, Laura Dee Bates, a Certified Shorthand Reporter and
5 Notary Public in and for the State of Texas, do hereby
6 certify that the above and foregoing transcript contains a
7 true and correct transcription of my shorthand notes taken
8 during the videotaped deposition of JACK E. PETERSON, P.E.,
9 Ph.D., after having been first duly sworn, on September
10 27th, 1996.

11
12 CERTIFIED TO on this the 21st day of October, 1996.

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Laura Dee Bates, CSR, RMR
3200 Old Union Road
Lufkin, Texas 75904
(409) 634-1879
My commission expires: 12-31-96
Certification No. 1371

22

1 FILING CERTIFICATE
2 CONSOLIDATED
3 CAUSE NO. A-135,876
4 KEITH F. GIBLIN, ET AL * IN THE DISTRICT COURT OF
5 VS. * JEFFERSON COUNTY, TEXAS
6 A.C.& S., INC., ET AL * 58TH JUDICIAL DISTRICT
7 CAUSE NO. A-140,498
8 JOYCE A. BORNE, ET AL * IN THE DISTRICT COURT OF
9 VS. * JEFFERSON COUNTY, TEXAS
10 ALLIED SIGNAL, INC., ET AL * 58TH JUDICIAL DISTRICT
11 CAUSE NO. E-141,216
12 JOSEPH E. BARNARD, ET UX * IN THE DISTRICT COURT OF
13 VS. * JEFFERSON COUNTY, TEXAS
14 ALLIED-SIGNAL, INC., ET AL * 58TH JUDICIAL DISTRICT
15 CAUSE NO. B-141,242
16 ROOSEVELT SCOTT * IN THE DISTRICT COURT OF
17 VS. * JEFFERSON COUNTY, TEXAS
18 AMERICAN OPTICAL CORPORATION, *
19 ET AL * 60TH JUDICIAL DISTRICT
20 CONSOLIDATED
21 CAUSE NO. A-134,614
22 FRENCH HICKS, ET AL * IN THE DISTRICT COURT OF
23 VS. * JEFFERSON COUNTY, TEXAS
24 BETHLEHEM STEEL CORP., ET AL * 58TH JUDICIAL DISTRICT
25 CAUSE NO. B-126,986
26 RUSSELL ALLEN, ET AL * IN THE DISTRICT COURT OF
27 VS. * JEFFERSON COUNTY, TEXAS
28 AMERICAN PETROFINA, INC., ET AL * 60TH JUDICIAL DISTRICT
29 CONSOLIDATED
30 CAUSE NO. A-144,426

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16 GLADYS FORRESTIER, ET AL * IN THE DISTRICT COURT OF
VS. * JEFFERSON COUNTY, TEXAS
17 AC&S, INC., ET AL * 58TH JUDICIAL DISTRICT

18 VIDEOTAPED DEPOSITION OF JACK E. PETERSON, P.E., Ph.D.

19 TAKEN ON SEPTEMBER 27, 1996

20 I, Laura Dee Bates, Certified Shorthand Reporter in and
21 for the State of Texas, hereby certify pursuant to the Rules
22 and/or agreement of the parties present to the following:

23 That this deposition transcript is a true record of the
24 testimony given by said witness, JACK E. PETERSON, P.E.,
25 Ph.D., after having been first duly sworn by me.

22

1 That \$709.00 is the charge for the preparation of the
2 completed deposition transcript and any copies of exhibits
3 charged to Counsel for the Plaintiffs, Hon. Joseph C.
4 Blanks, SBN 02456700.

5 That the deposition transcript was submitted the
6 21st day of October, to JACK E. PETERSON, P.E., Ph.D.,
7 through his attorney, Hon. Arthur Almquist, for examination
8 and signature and returned to Laura Dee Bates, CSR, RMR, the
9 _____ day of _____, 1996. The attached witness
10 certificate sheet contains any changes and the reasons
11 therefor made by the witness.

12 That the deposition transcript ^ was ^ was not returned
13 to the deposition officer by the witness and/or counsel.

14 That the original deposition transcript, or a copy
15 thereof, together with copies of all exhibits, was delivered
16 on the _____ day of _____, 1996, to the attorney
17 or party who asked the first question appearing in the
18 transcript.

19 That pursuant to information made a part of the record
20 at the time said testimony was taken, the following includes
21 all parties of record:

22 (See Attachment "A".)

23 That a copy of this certificate was served on all
24 parties shown.
25

22

1 GIVEN under my hand and seal of office on this the
2 _____ day of _____, 1996.
3
4

5 Laura Dee Bates, CSR, RMR
6 3200 Old Union Road
7 Lufkin, Texas 75904
8 (409) 634-1879
9 My commission expires: 12-31-96
10 Certification No. 1371
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