

CERTIFIED COPY

18TH JUDICIAL DISTRICT COURT

PARISH OF IBERVILLE

STATE OF LOUISIANA

LLOYD GLEN SMITH,

Plaintiff

-VS-

THE DOW CHEMICAL COMPANY,

Defendant

No. 37,242

DIVISION "C"

1720 Zonal Avenue
Suite 226
Los Angeles, California

Friday, August 2, 1991
10:20 a.m.

Deposition of

KAYE H. KILBURN, M.D.

Taken by

LEWIS O. UNGLESBY, ESQ.

Reported by

NANCY MADDUX, CSR No. 4300

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Deposition of KAYE H. KILBURN, M.D., called
as a witness by the Plaintiff, taken before
Nancy Maddux, CSR No. 4300, at Suite 226,
1720 Zonal Avenue, Los Angeles, California,
on Friday, the 2nd day of August, 1991, at
10:20 a.m., pursuant to Notice.

APPEARANCES OF COUNSEL:

For Plaintiff:

UNGLESBY LAW OFFICES
By: LEWIS O. UNGLESBY, ESQ.
246 Napoleon Street
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For Defendant:

DICKSON, CARLSON & CAMPILLO
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I N D E X**WITNESS**

Kaye H. Kilburn, M.D.

[By Mr. Unglesby]

4

[By Mr. Carlson]

40

EXAMINATION**E X H I B I T S****NUMBER****MARKED FOR IDENTIFICATION****Lloyd Glen Smith Exhibit**

1 Curriculum Vitae

4

2 Table 1: Neurobehavioral Tests,
 Functions Measured and Their Sources
 Table 2: Lloyd Smith (LS) Compared
 to Neurobehavioral Test Scores and
 Confidence Intervals (sd) for 14
 Control Firemen With Significant
 Differences

29



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P R O C E E D I N G S

K A Y E H . K I L B U R N , M . D . , called as
 a witness by the Plaintiff, being first duly
 sworn, was examined and testified as follows:

EXAMINATION

BY MR. UNGLESBY:

Q Dr. Kilburn, I am Lewis Unglesby. I
 represent Lloyd Glen Smith in a suit against Dow Chemical.

We are taking your deposition for the
 trial here in your office at the University of Southern
 California. You have provided me with a CV.

Is this up to date through 1990 or '91?

A That's through July 1991.

MR. UNGLESBY: All right. I will mark this
 as Lloyd Glen Smith 1.

[Lloyd Glen Smith Exhibit 1
 was marked for identification.]

MR. CARLSON: Excuse me. Do you have
 a copy for me?

MR. UNGLESBY: Well, I will give you this
 one.

MR. CARLSON: Okay.

Q [By Mr. Unglesby] Dr. Kilburn, your



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1 CV reflects that you are Ralph Edgington Professor of
2 Medicine at the University of Southern California School
3 of Medicine, the Director of Environmental Sciences Lab
4 since 1980. Is that correct?

5 A Yes.

6 Q And you are the editor-in-chief of Archives
7 of Environmental Health since 1986?

8 A Yes.

9 Q You graduated from the University of Utah
10 School of Medicine in 1954?

11 A Yes.

12 Q And you have had various appointments to
13 the hospitals reflected in this CV, ranging from England
14 to Southern California to Duke to New York City, Utah and
15 other places; correct?

16 A Yes.

17 Q And you are certified by the American Board
18 of Internal Medicine since 1963?

19 A That's right.

20 Q And the American Board of Preventive
21 Medicine and Occupational Health in 1983?

22 A Yes.

23 Q Specifically, Doctor, you reflect numerous
24 academic appointments and positions which we will not --
25 and multiple publications.



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1 Let me ask you this: You have also
2 been accepted as an expert in the field of pulmonology,
3 occupational medicine and internal medicine in the State
4 of Louisiana by the courts there; is that correct?

5 A Yes, it is.

6 Q And as it relates to Mr. Smith's
7 complaints, the claim that he makes regarding vinyl
8 chloride exposure and its neurological and lung damage
9 are two areas in which you have studied a large part of
10 your professional career?

11 MR. CARLSON: Objection. Vague.

12 Q [By Mr. Unglesby] You can answer.

13 A Yes.

14 Q All right. You have published in both of
15 those fields, small airways disease --

16 A Yes.

17 Q -- and neurological manifestations caused
18 by exposure to toxic chemicals --

19 A Yes.

20 Q -- is that correct?

21 A Yes.

22 Q Specifically as to vinyl chloride,
23 Dr. Kilburn, have you previously testified as an expert
24 in the courts of Louisiana and in other places in America
25 on the effects of vinyl chloride on the individual?



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1 MR. CARLSON: Objection. Vague, overbroad.
2 Q [By Mr. Unglesby] You can answer the
3 question.
4 A Yes.
5 MR. UNGLESBY: All right. I would attach
6 this as Smith's 1.
7 MR. CARLSON: Doctor, do you have an extra
8 copy of your CV?
9 MR. UNGLESBY: Well, yes, I can get one.
10 MR. CARLSON: Yes. I would appreciate it
11 if you could -- I mean, I can work off of this, but sh is
12 going to want to take it with her for an exhibit.
13 MR. UNGLESBY: And it's --
14 THE WITNESS: And you want to take one with
15 you?
16 MR. CARLSON: Yes, please.
17 MR. UNGLESBY: That's not a problem. Let's
18 keep going.
19 MR. CARLSON: Okay.
20 MR. UNGLESBY: I'm sorry. I apologize.
21 I am tendering him as an expert to testify. If you want
22 to cross-examine him on his expertise, it is up to you, or
23 you can wait until later.
24 MR. CARLSON: I will wait until later.
25 MR. UNGLESBY: All right.



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1 Q [By Mr. Unglesby] Now, Dr. Kilburn, let's
2 talk about Glen Smith, if we may.

3 You saw Mr. Smith?

4 A Yes, I did.

5 Q And where did you see Mr. Smith?

6 A At Southern California Environmental
7 Medical Clinic in Long Beach.

8 Q All right, sir. And at that time what did
9 you observe were Mr. Smith's complaints?

10 A This was on June 20, 1989, and he
11 complained of some difficulty with his breathing and
12 limitation in his ability to move because of his joint
13 pain, arthritis. He also told me that he had some
14 difficulty with memory and his ability to concentrate
15 and make decisions.

16 Q How old was Mr. Smith at that time, sir?

17 A Forty-one.

18 Q Were you able to do any tests or
19 examinations of the individual?

20 A Yes.

21 Q Would you tell us -- Let's break it down as
22 to his complaints of breathing problems.

23 What tests did you run and what were the
24 results?

25 A I did a physical examination of the chest,

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1 which was basically normal. He had normal breath sounds,
2 normal shaped chest, and he moved well with respiration.

3 I did a chest x-ray, which was also
4 basically normal, although his inspiration only took
5 his diaphragm down to the level of the 9th rib, which
6 is somewhat restricted.

7 His pulmonary function tests showed --

8 MR. CARLSON: Excuse me, Doctor.

9 Just for the record, since this is a trial
10 deposition, could we clarify that the doctor is reviewing
11 his report as he is testifying?

12 MR. UNGLESBY: Absolutely.

13 MR. CARLSON: Thank you.

14 A [Continuing] His vital capacity was
15 reduced. His forced expiratory volume in one second
16 was also reduced, and he had reduction in flow in small
17 airways as shown by the forced expiratory flow between
18 25 and 75 percent of vital capacity and between 75 and
19 80 percent of vital capacity.

20 All of these reductions are significant and
21 lead to the diagnosis of small airways obstruction with
22 air trapping.

23 Q [By Mr. Unglesby] Can you tell us, sir,
24 whether you would anticipate in an individual 41 years old
25 who had no history of smoking cigarettes such findings?



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1 A No. They are distinctly unusual in someone
2 who is a nonsmoker, and one immediately searches for
3 a cause.

4 Q And did you get a history from Mr. Smith in
5 which he indicated that between the years 1970 and 1974,
6 according to him, he had been in an environment in which
7 he had been exposed directly to vinyl chloride, vinyl
8 chloride in regards to it as both a liquid and mist
9 or spray-type situation on a fairly consistent basis
10 throughout those years?

11 MR. CARLSON: Objection. Lack of
12 foundation, incomplete hypothetical.

13 Q [By Mr. Unglesby] Go ahead.

14 A Yes. He gave me quite a detailed history
15 of loading barges and ships with vinyl chloride while he
16 worked for Dow in which he directed a six-inch tube or
17 pipe over and into tank compartments and ran liquid vinyl
18 chloride into these, and also bleeding off the vapors and
19 adding antioxidants when this loading was finished, and
20 that he did three or four barges and up to five ships
21 a week without any respiratory protection in terms of
22 an air supply or even a chemical mask.

23 Q Now, Dr. Kilburn, can you tell us wheth r
24 from your experience in occupational medicine and
25 pulmonology you are aware of any studies or medical



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1 cause-and effect opinions as to the exposure of an
2 individual to vinyl chloride and the lung or small
3 airways dysfunction that you observed in Mr. Smith?

4 A Yes. There is literature -- Perhaps
5 the best paper directed right at the topic comes from
6 Dr. Al Miller at Mount Sinai and was published in the
7 Annals of the New York Academy of Sciences -- I think it
8 was 1976 -- I can check the date -- in which they studied
9 a group of vinyl chloride workers and found small airways
10 obstructive disease in this group of workers.

11 Q Now, the small airways obstructive disease
12 that you see in Mr. Smith, can you tell us what kind of
13 day-to-day problems, lifestyle problems, that would create
14 for a person with the same scores, I guess, on the tests
15 as you observed with him?

16 A Well, it interferes with the ease with
17 which one breathes, so we see an increase in the work of
18 breathing such that when there is a need for additional
19 respiration with even mild or moderate exercise, the work
20 of breathing may become excessive, so the person can't
21 perform even modest exercise such as going up a flight
22 of stairs.

23 Q Now, would the findings you see on
24 Mr. Smith that reflect a small airways dysfunction be
25 consistent with his history of exposure in terms of both



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1 the type and the extent of the diminished capacity?

2 MR. CARLSON: Objection. Lacks foundation.

3 A Yes. There seems to be no apparent
4 recovery, as far as the studies show us, from vinyl
5 chloride-induced breathing impairment of this sort, so
6 that once it is induced, it is permanent; may even get
7 worse.

8 Q [By Mr. Unglesby] Well, that was my next
9 question. Do you have any predictions or opinions as to
10 whether it would be expected to do so, taken into account
11 that it is now probably sixteen to seventeen years since
12 his gross exposure has occurred?

13 A Well, I think it's probable that it will
14 get worse, as that is the course of small airways diseases
15 in people who have it induced, for example, by asbestos
16 or by cotton dust or by other specific exposures, even
17 chlorine or nitrogen dioxide, so the general effect is
18 that if the small airways become scarred, the scarring
19 continues to worsen over time.

20 Q Dr. Kilburn, is there anything that can be
21 done to reverse the process in regards to Mr. Smith?

22 A No. We haven't been clever enough to undo
23 small airways scarring, even in the disease asthma, which
24 has a large component of small airways disease. That is
25 the component that doesn't seem to be reversible, even



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1 with exceptional close attention to treating every sort
2 of -- every possible avenue, improving bronchial dilation,
3 getting rid of secretions, even providing anti-inflammatory
4 treatment. Nothing really seems to avail in this
5 situation.

6 Q Doctor, are you aware of any studies that
7 implicate vinyl chloride monomer with cancer?

8 A Yes.

9 Q Can you answer -- Specifically what I'm
10 talking about here is -- Well, let me ask you: What kind
11 of cancer?

12 MR. CARLSON: I am going to object to this
13 line of questioning as irrelevant.

14 Q [By Mr. Unglesby] Okay. You can go ahead.
15 Mr. Carlson is from California. He doesn't know what th
16 case is about or Louisiana law, so he has to make all
17 these objections.

18 Will you tell us --

19 MR. CARLSON: Well, Mr. Oglesby --

20 MR. UNGLESBY: Unglesby.

21 MR. CARLSON: I am familiar with the case,
22 and I do have a right to raise objections on behalf of
23 my client, and my recommendation is that if I make an
24 objection, we just proceed and make it for the record --

25 MR. UNGLESBY: Okay.



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1 MR. CARLSON: -- and we don't waste time.

2 Q [By Mr. Unglesby] The question was: Will
3 you tell us, please, if you know, what studies, what
4 connections have been raised in the various studies done
5 by Dow Chemical and others in regards to vinyl chloride
6 exposure other than the potential of contracting cancer?

7 A Well, there are a large number of studies
8 from this country done by Monson & Peters, one of them
9 from England, a group of Walker and Wilson and Black,
10 as well as from Germany and now Japan, showing that in
11 workers collected because they share exposure to vinyl
12 chloride monomer there is an increased risk of cancer of
13 the liver, gallbladder, biliary tract, lung, and added
14 into that in some of the cohorts are brain tumors as w ll.

15 Q Now, as to Mr. Smith specifically, first,
16 if we assume for purposes of the question that the facts
17 will show he was exposed to vinyl chloride in the years we
18 have discussed, as he related to you, without the benefit
19 of respiratory protection, and that he has small airways
20 disease, which would, from history, be created by vinyl
21 chloride exposure, and it's now been, again, sixteen
22 or seventeen years since his last gross exposure, can
23 you give us any opinion as to whether Mr. Smith is in
24 increased jeopardy of contracting cancer as opposed to
25 the general population or those unexposed to vinyl



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1 chloride in the fashion which he relates?

2 MR. CARLSON: Objection. Lack of
3 foundation, incomplete hypothetical, irrelevant, and
4 assumes facts not in evidence.

5 Q [By Mr. Unglesby] Go ahead.

6 A The likelihood that he will develop
7 epithelial cancer, that is, a cancer of the bile duct,
8 gallbladder, or lung, he is coming to about twenty years
9 after the beginning of exposure, at the period of maximum
10 risk, which will last for a decade or more.

11 For angiosarcoma, the most unequivocally
12 clear tumor caused by vinyl chloride, which is a tumor of
13 the vessels in the liver, it also seems to be -- reach
14 its maximal prevalence sometime after twenty years from
15 beginning exposure, so I would think that from both the
16 epidemiological studies and the anecdotal reports that
17 he is approaching his time of maximal risk in the next
18 decade.

19 Q Is Mr. Smith's potential for contracting
20 any of those diseases you have just related greater than
21 the average individual directly resulting from the fact
22 that he has been exposed to vinyl chloride and that the
23 vinyl chloride has, through the small airways obstruction
24 findings, specifically intruded into and affected his
25 internal organs?



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1 A Yes.

2 Q Do you happen to know, Dr. Kilburn, whether
3 angiosarcoma of the liver created by vinyl chloride
4 exposure or lung cancer created by vinyl chloride exposure
5 are a hundred percent fatal?

6 A Well, the angiosarcomas, there is no
7 question about that; it is rapidly fatal, approximately
8 like a mesothelioma.

9 The lung cancer seems to behave like the
10 general prevalence of lung cancers related to tobacco
11 smoke, in that if it is discovered very early, the five-
12 year survival may be as high as 30 percent; if it is
13 discovered by symptoms, which is the usual fashion, the
14 five-year survival is around 8 percent.

15 Q Now, Dr. Kilburn, would you recommend that
16 Mr. Smith, in view of his situation, that he have any
17 particular future medical monitoring?

18 A Yes. He certainly ought to be monitor d at
19 least once a year, and preferably three times a year, for
20 lung cancer.

21 Q That would just involve x-rays?

22 A Yes, basically.

23 Q All right. Sir, what about liver scans?

24 A It is difficult to know whether it would be
25 useful to find an angiosarcoma early, as there doesn't

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1 seem to be any possible therapy except the possibility
2 that if it were localized it could be treated by partial
3 hepatectomy, meaning partial removal of the liver.

4 I suppose, with that in mind, trying
5 to find it early by scan would be advantageous, but I
6 know of no experience in that regard, so that is really
7 a recommendation based on probabilities rather than
8 experience.

9 Q All right. Sir, now referring to
10 Mr. Smith's complaints with his memory and his --

11 A Balance and so forth?

12 Q -- balance and ability to process
13 information, what did you do and how did you do it?

14 A Well, I examined him using a battery of
15 neurobehavioral tests, none of which are original. They
16 are adopted or adapted from batteries that have been put
17 together for examining memory; for example, the Wechsler
18 Memory Scale for scaling intelligence, the Wechsler Adult
19 Intelligence Index, and for measuring responses such
20 as the ability of a person to maintain their position
21 standing, eyes open and eyes closed, balance or sway
22 testing, we have actually built an apparatus to do a test,
23 which was first described in the nineteenth century and
24 which an apparatus was first devised in the nineteen
25 forties, and, finally, we have used parts of the Halstead



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1 Reitan Battery, which was devised by a neurosurgeon,
2 neuropsychologist at the University of Michigan for
3 localizing damage in the nervous system by tumors and
4 infarctions and vascular problems in the days before
5 scanning technology was developed.

6 These tests take about three hours and
7 require a large amount of cooperation by the person being
8 tested.

9 Q And did you apply these tests to Mr. Smith?

10 A Yes.

11 Q Have you previously, Dr. Kilburn, in your
12 studies in occupational medicine used a similar battery of
13 tests to exposed groups?

14 A Yes.

15 Q And has your testimony in regard to those
16 tests to those exposed groups been accepted in the court
17 in Louisiana?

18 A Yes, it has.

19 Q Now, Dr. Kilburn, through your work in
20 occupational medicine and pulmonology, cancer research
21 and internal medicine, have you gone over -- have you both
22 coordinated with and critiqued the neuropsychological
23 aspects of this case through work with neuropsychologists,
24 psychiatrists, and neurologists?

25 MR. CARLSON: Objection. Vague, ambiguous,



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1 lacks foundation.

2 A Yes.

3 Q [By Mr. Unglesby] Have you recently
4 produced a paper in regards to this battery of tests
5 as to its usefulness in screening for neurological or
6 neurobehavioral damages created by toxic exposure?

7 A Yes. Actually, we have just submitted two
8 papers for publication on this topic, as well as having
9 been notified of an additional paper on the measurement
10 of balance and hearing in occupational groups which has
11 been accepted for publication in the British Journal of
12 Industrial Medicine.

13 Q How does one go about getting the British
14 Journal of Industrial Medicine to accept one of their
15 papers and publish it to the medical community in Great
16 Britain?

17 A Well, it's really published to the world
18 medical community. Half the subscribers to that journal
19 are in the United States and about a quarter in Britain
20 and a quarter in the rest of the world.

21 It is done by submitting the paper. It
22 is then critiqued or reviewed by two reviewers who mak
23 recommendations, and they either recommend publication
24 as is or revisions. In this case --

25 Q Or they can reject it --

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- 1 A Yes.
- 2 Q -- as bad science; correct?
- 3 A Really. In this case, the paper was
- 4 immediately accepted by Dr. Walton, who is the editor,
- 5 and it is apparently scheduled for publication sometime
- 6 this fall.
- 7 Q And do you know -- Can you tell us the name
- 8 of that, the name of this paper?
- 9 A It's "Hearing and Balance."
- 10 Q Would your CV help any?
- 11 A Yes, it's in there.
- 12 Q Do you have that here? Is this it?
- 13 A Here it is, "Hearing and Balance Loss" --
- 14 I'm sorry. Let's start again. "Are Hearing Loss and
- 15 Balance Dysfunction Linked in Construction Iron Workers,"
- 16 by Kilburn and Warshaw.
- 17 Q Have you recently made a presentation to
- 18 the world health community regarding the use of these
- 19 tests for the identification of exposure to toxic
- 20 chemicals such as vinyl chloride and solvents?
- 21 A Yes.
- 22 Q And where was that, sir?
- 23 A It was at the University of Tokyo in Japan,
- 24 the 8th through the 11th of July, 1991.
- 25 Q And what types of people would attend such



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1 a seminar?

2 A It consists of people in the occupational
3 health area who are interested in neurobehavioral
4 toxicology. The conference is actually called
5 "Neurobehavioral Methods of Effect in Environmental
6 and Occupational Disease," so the attendees include
7 neurologists, psychologists, and people like myself
8 trained in internal medicine who have used the test
9 batteries, and people, some of whom are not trained
10 in medicine but are psychologists, either trained in
11 neurophysiology or neuropsychology.

12 It is a meeting of representatives of
13 thirty-three nations, six of the plan -- not planets
14 but --

15 Q Continents?

16 A -- continents of the world, and about
17 250 people altogether.

18 Q In the presentation of that paper -- Well,
19 in order to be allowed to present such a paper as that
20 to that kind of a group, Dr. Kilburn, did the standard
21 scientific community have to accept your methodology?

22 MR. CARLSON: Objection. Vague and
23 ambiguous. Lacks foundation.

24 Q [By Mr. Unglesby] That probably is a bad
25 question.



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1 What I am asking is this: In order to be
2 able to make this presentation to the various physicians
3 and students of occupational medicine around the world,
4 did the battery of tests and their benefits in identifying
5 neurobehavioral dysfunction created by exposure to toxic
6 chemicals have to be critiqued and discussed and accepted
7 by the consensus of those medical doctors?

8 MR. CARLSON: Objection. Vague and
9 ambiguous, compound, calls for speculation.

10 Q [By Mr. Unglesby] Now you can answer.

11 A Well, originally, on notification of the
12 upcoming meeting, we were asked to submit abstracts. I
13 did so for the three papers that I mentioned, and another
14 one on the blink reflex.

15 All of the abstracts were accepted for
16 presentation, and then in the development of the program
17 I was asked to chair the session on environmental studies,
18 which included methyl mercury in Minimata Bay, it's in
19 southern Japan, and some exposures in Germany and Canada
20 and China as well as in the United States, and I mentioned
21 Japan, and then they asked me to select, of the two papers
22 which I presented on this, I was to present on this
23 subject the one that I would prefer to put in this plenary
24 session, and I selected one on toxic waste exposure of
25 a population in Louisiana, and it was presented.



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1 Q Now, these various tests, as they relate to
2 Glen Smith, what did they tell us specifically as to him?

3 A Well, what they did was profile, in
4 a sense, the types and severity of impairment; and, first
5 of all, he had reduction in his performance for verbal and
6 visual recall of information. These are generally called
7 immediate memory tests.

8 In contrast, he had no effect with what
9 we would call crystallized memory tests. These tests
10 test information learned in school or learned years ago
11 and tend to be in the areas that don't deteriorate from
12 chemical exposure, as compared to the ability to encode
13 and recall new information.

14 He also had poor motor perceptual decision-
15 making commands in that he was slow in constructing
16 designs, seeing, actually, relationships between designs,
17 and in even being able to manipulate his hands with either
18 pencil or without pencil, to make decisions and carry out
19 operations, like putting a slotted peg in a pegboard, or
20 following numbers, drawing connecting lines to make trails
21 between numbers or between numbers and letters.

22 All of this has probably more to do with
23 the decision-making capacity of the brain than it does
24 with how well his fingers operate.

25 He also had some defect in perception on



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1 his right hand that I think reflects localized effects of
2 vinyl chloride on the peripheral nerves --

3 MR. CARLSON: Excuse me, Doctor. Are you
4 referring to Table 2 of your report?

5 THE WITNESS: Yes.

6 A [Continuing] And he had a delayed choice
7 reaction time with a normal simple reaction time.

8 This, again, when he has to make decisions
9 then his decision-making capacity is present, but it is
10 slowed down, so it -- He made decisions at an average
11 of about .68 of a second instead of around .5, or half
12 a second, where he should have.

13 All of these, I think, reflect the effect
14 of chemical exposure on the brain, and in this case most
15 likely vinyl chloride, because that is what he was heavily
16 exposed to.

17 MR. CARLSON: For purposes of the record,
18 I would move to strike the doctor's answer based upon
19 the fact that his testimony was pertaining to Table 2
20 Neurobehavioral Tests; is speculative.

21 Q [By Mr. Unglesby] Dr. Kilburn, let's
22 answer that, if we may.

23 What scientific medical basis do you use
24 in making these comparisons? And in Table 2 it does
25 relate -- and we will attach all this -- to a comparison



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1 of Mr. Smith with fourteen control firemen. What do you
2 mean by that?

3 A Well, it is always important to make
4 comparisons of a population or an individual to a group
5 who are in as many ways similar to the individual or group
6 but lack the specific exposure or any exposure that might
7 have an adverse effect on their neurobehavioral function.

8 In this case, controls were selected in
9 Louisiana; the comparison population for firemen who had
10 been exposed to a fire in which transformers containing
11 PCBs and benzofurans were overheated by the fire and then
12 exploded, such as to spread the chemical around.

13 In order to analyze that population, we had
14 the fire chief pick matches for the exposed men, and we
15 tested them at the same time --

16 Q You mean what you had is a control group
17 that was unexposed?

18 A Yes. These were firemen who didn't even
19 respond to that fire.

20 Q Okay.

21 A And this gave us, then, a statistical base
22 in fourteen people for establishing what their mean
23 performance is and what the confidence intervals are,
24 upper and lower limits for the performance, and what are
25 marked as pluses after Mr. Smith, who, as indicated on



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1 this table as LS, the pluses indicate where his test
2 results were outside the 95 percent confidence interval.

3 This is very similar to what we do in
4 pulmonary function when we say that, well, his vital
5 capacity and FEV-1 were outside the 95 percent confidence
6 intervals for the population which we compared him against
7 for pulmonary function, which happens to be a population
8 recruited in the State of Michigan to represent Michigan
9 people as a microcosm or sample of the United States
10 population. We sampled a proportionate number of urban
11 and rural men and women in Michigan to represent the
12 population.

13 Q And that is the standard used all over the
14 United States?

15 A Yes. This is a standard way of going about
16 creating from tests results statistical limits that --
17 against which one can make the comparisons of -- as I say,
18 either an individual or a group of people.

19 Q And so the reason you used the fourteen
20 control firemen from Louisiana was because you knew that
21 those were fourteen people done in a separate study who
22 had not been exposed to vinyl chloride or to any other
23 sequential solvents' exposure and had specifically been
24 screened to make sure that they hadn't been exposed and
25 represented people who all had at least a high school



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1 education and had come from backgrounds similar to that
2 of Mr. Smith?

3 A Yes.

4 Q You already had all that information before
5 you ever heard of Glen Smith?

6 MR. CARLSON: Objection. Vague, overbroad,
7 lacks foundation.

8 Q [By Mr. Unglesby] You had all of that in
9 your study before you ever heard of Glen Smith; correct?

10 A Yes.

11 Q And so you felt that that was a good
12 comparison to use, since these people had taken all of
13 these same tests and you knew their historical back-
14 ground and educational background, and you knew Smith's
15 historical background and educational background, at least
16 as he relayed it to you?

17 A That's correct. And, furthermore, this
18 data has been published, so it is available to everyone
19 in the literature.

20 Q And if Mr. Carlson wanted to look that up,
21 how would he do that, Doctor?

22 A Well, my CV would be helpful, too.
23 The paper is No. 158 in my CV, by Kilburn, Warshaw
24 and Shields, "Possible Improvement in Neurobehavioral
25 Function following Detoxification of Firemen Exposed to



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1 Polychlorinated Biphenyls," Archives of Environmental
2 Health, 1989, Volume 44, Pages 345 to 350.

3 Q And, specifically, the usefulness in regard
4 to this case was not to the exposed group but to the
5 nonexposed group and comparing them with Glen?

6 A That's correct. What was used was the
7 control side of a matched control group comparison study.

8 Q Okay. In doing that, what final
9 conclusions did you draw in relationship to Glen Smith?

10 MR. CARLSON: Objection. Foundation,
11 speculation.

12 A Well, in review of what he has -- Just to
13 mention it again, he has reduction in his recent recall
14 memory, a reduction in cognitive function as measured
15 in culture fair, f-a-i-r, and block design, a loss of
16 eye-hand coordination as measured in pegboard trails and
17 choice reaction time, and I believe these defects are most
18 consistent with a substantial exposure to vinyl chloride
19 and to other solvents that he was exposed to over his
20 whole career.

21 I think the most predominant exposure out
22 of those is to vinyl chloride.

23 Q [By Mr. Unglesby] You are basing that on
24 the history that he provided you as far as the exposur ?

25 A Yes.

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1 Q But the tests are consistent with a
2 diminished brain function that has been found in people
3 exposed to toxics such as vinyl chloride over years?

4 A That's right, yes.

5 MR. UNGLESBY: Now, I will attach this --
6 By the way, I am going to attach these three as Smith's 2.
7 I think that is the three you were asking about.

8 MR. CARLSON: Yes.

9 MR. UNGLESBY: Okay.

10 [Lloyd Glen Smith Exhibit 2
11 was marked for identification.]

12 Q [By Mr. Unglesby] And while I am on that
13 subject, Dr. Kilburn, the last page of Smith 2 refers to
14 comparisons, again, with the fourteen men that we hav
15 discussed and has some numbers out there for Lloyd Smith,
16 9, 8, 7, 12, 1, 4, and 17 total P-O-M-S score.

17 What does the P-O-M-S stand for?

18 A Profile of Mood States.

19 Q Okay.

20 A This is a test used to appraise effective
21 condition, you might say emotional status of an individual,
22 and what we see is that this is not an upset and angry,
23 depressed, fatigued or confused man. He is -- actually
24 has a POMS score that is normal.

25 Q The normality of that score, I appreciate



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1 the chart enables you to disregard the idea that any of
2 the tests on Table 2, which are more of the neuro-
3 behavioral tests or results, or the results are skewed
4 by any emotional dysfunction or disease that Glen may
5 have; is that correct?

6 A Yes, that is the inference that can be, I
7 think, safely made from the evidence, that he has normal
8 scores.

9 Q So psychiatrically or emotionally he is
10 a healthy person?

11 A Yes, that's what the testing says for
12 June 20, 1989, and the week preceding, which is the way
13 that test is given.

14 Q And he appeared to be in his relationship
15 with you appropriate in those regards?

16 A Yes. I should have mentioned that, but I
17 made a note of it in the letter, and it is part of the
18 report that not only did he seem pleasant and appropriate
19 but he seemed fully cooperative with all parts of the
20 examination and testing.

21 Q So then we have on Page 2 of Smith 2 --
22 and I will go ahead and just write 1, 2, 3 on these pages;
23 1 would be the list of tests you gave, 2 would be the test
24 scores and results, and 3 would be the mental status exam
25 in terms of psychiatric profile.

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1 It is on Page 2 that Glen reflects the out-
2 of-balance problems indicating neurological dysfunction;
3 correct?

4 A Yes.

5 Q And that is in your mind, I mean from your
6 studies and in the literature, consistent with vinyl
7 chloride exposure?

8 MR. CARLSON: Objection. Foundation,
9 speculation.

10 A Yes.

11 Q [By Mr. Unglesby] If you can tell us,
12 Dr. Kilburn, is this a reversible situation?

13 MR. CARLSON: Same objection.

14 A My experience -- and when this is due to
15 exposure to chemicals, with the exception of ethyl alcohol
16 or ordinary beer, wine, and whiskey alcohol, the answer is
17 no. That is the only chemical that has widely been shown
18 to have reversibility.

19 There is some evidence that xylene and
20 toluene, benzene derivatives, are reversible for some of
21 these tests by doing exposure of subjects; but by and
22 large the experience has been with occupational exposure
23 these tests revealed irreversible changes, and this has
24 been established by retesting individuals at intervals
25 after exposure and finding that in most cases once down,

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1 they stay down, or once deficient, they stay deficient.

2 Q [By Mr. Unglesby] In regard to the
3 findings on Page 2 of Smith 2, do you have any -- do
4 you give any information or opinion as to what these
5 deficiencies -- how these deficiencies would affect
6 a person 41 years old such as Glen and --

7 MR. CARLSON: Objection --

8 Q [By Mr. Unglesby] -- and whether or not it
9 is anticipated that you would find this in a person with
10 Glen's historical background absent the vinyl chloride
11 exposure?

12 MR. CARLSON: Objection. Foundation and
13 speculation.

14 A They are a pattern that would not be
15 anticipated in a person without exposure to some toxic --
16 neurotoxic material.

17 Furthermore, they are in a pattern -- What
18 was the first part of your question?

19 Q [By Mr. Unglesby] Well, why don't you --
20 Are you finished with that answer in terms of the
21 patterns?

22 A Yes, I am.

23 Q All right. Then I wanted to know whether
24 or not if you could tell us what results like these
25 reflect in a person's daily life or ability to do or



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1 not do any particular tasks or a chore.

2 A Well, it would be mostly reflected in
3 trying to do intellectually, perform anything from
4 remembering telephone numbers to remembering conversations
5 so that he could make choices. That is on the memory
6 side.

7 On the making choices, mental cognitive
8 function side, he is going to be slow; and, you know, if
9 he were doing things like some of my patients, assembling
10 automatic transmissions, he would not be able to follow
11 through a sequence of procedures because he couldn't
12 remember what came after what and couldn't see the logic
13 of the whole thing, or if he was, for instance, a loan
14 officer in a bank, he couldn't recall what decision he
15 had made recently about loans and would therefore show
16 inconsistency in performance.

17 MR. CARLSON: That's a problem they all
18 have.

19 THE WITNESS: That's at a very low level in
20 banks. I haven't had patients that are BCCI executives.
21 They might be interesting to test, as a matter of fact.

22 Q [By Mr. Unglesby] From the scores, if you
23 could tell, would Mr. Smith have a difficult time, for
24 example, working in a plant such as Dow doing control-type
25 work, in other words, inside with a board, computer board,



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1 or control board, that required him to get -- check
2 gauges, record information and monitor and alter certain
3 activities in the plant as it related to whatever shows up
4 on those various boards in terms of -- you know, in terms
5 of what they do in places such as Dow?

6 MR. CARLSON: Objection. Foundation,
7 speculation.

8 A Well, I think, you know, that's an example.
9 I was thinking of another that's similar, and that is
10 running the -- oh, what do you call them? -- the gates
11 on the Tennessee Valley dams, but in any process control
12 operation where you have to remember sequences and make
13 decisions based on reading dials he is going to be slow
14 and I think have trouble, because he may leave out, you
15 know, one important step in a sequence and thus mess up;
16 so I think that he is excludable from that kind of
17 employment.

18 Q [By Mr. Unglesby] All right. But is it
19 a fair statement that, in your opinion, at least, and
20 based on these tests and historical information you have
21 been provided by Glen as to vinyl chloride exposures and
22 the way that has been provided to you that in fact reflect
23 that neurologically he has been damaged so that his mental
24 capacity is diminished below what would be expected of th
25 normal 41-year-old?



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1 MR. CARLSON: Objection. Foundation and
2 speculation.

3 A Yes. I think the test evidence establishes
4 that clearly.

5 MR. UNGLESBY: All right. I will introduce
6 this as Smith 2.

7 Q [By Mr. Unglesby] And that is, in your
8 opinion, irreversible, and something that does have
9 a specific day-to-day effect on his capacity to sequence
10 information, remember things and make cognitive judgments
11 and differentiate and discriminate between the daily
12 activities that are necessary in the modern world?

13 MR. CARLSON: Objection. Foundation and
14 speculation.

15 A Yes.

16 Q [By Mr. Unglesby] All right. Finally,
17 Dr. Kilburn, in your report you reflect upon the fact that
18 Glen has very severe arthritis and had observed in some
19 x-rays that you took in 1989 that he might have specific
20 abnormalities unique to vinyl chloride exposure in his
21 hands; is that what you said then?

22 A Yes, it is.

23 Q Subsequent to that have you been provided
24 with some additional x-ray reports from 1986 and '87 taken
25 by Oschner, O-s-c-h-n-e-r, Clinic in New Orleans and some



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1 1991 films taken in Baton Rouge?

2 A Yes, I have.

3 Q Have you compared all of those?

4 A Yes.

5 Q Is it now your opinion that he suffers
 6 from the specific -- I'm going to spell this for you --
 7 a-c-r-o-o-s-t-e-o-l-y-s-i-s, acro-osteolysis?

8 The question was: After you reviewed all
 9 of these films, do you think he has got that?

10 A No.

11 Q And do you think -- Do you have any opinion
 12 -- Let me read this to you. It's been said by Dr. --

13 MR. CARLSON: Shucks, I just spent eight
 14 hours preparing cross-examination on that.

15 MR. UNGLESBY: I apologize. I mean,
 16 I really do.

17 Okay. I didn't know the answer to that
 18 until I looked at all the films either.

19 Q [By Mr. Unglesby] It has been said
 20 by Dr. Rosenberg at Oschner's that it is possible,
 21 theoretically, that vinyl chloride has affected Glen's
 22 condition based on the idea that a virus or environmental
 23 factor can damage tissue around a joint, creating an
 24 immune system response which doesn't stop, so that th
 25 immune system keeps going back and going back after the



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1 damaged tissue, even though the environmental factor has
2 now been removed.

3 He refers to that as a theoretical
4 possibility for an explanation as to Glen's acute
5 arthritis.

6 Do you agree or disagree that that is
7 a possibility?

8 MR. CARLSON: I would object. It
9 mischaracterizes Dr. Rosenberg's testimony and lacks
10 foundation and is speculative.

11 Q [By Mr. Unglesby] Go ahead.

12 A Well, I think that we are presented with a
13 man who has a very severe arthritis variant sero-negative
14 with joint changes in a pattern that resembles what is
15 commonly called rheumatoid arthritis, and as rheumatoid
16 arthritis is a disease we don't understand what its causes
17 are except that it is inflammatory and it seems to have
18 followed his, as Dr. Rosenberg points out, infections,
19 at times, trauma, chemical exposure, that it is quite
20 conceivable that to explain the latent period between his
21 large-scale vinyl chloride exposure, which is known to
22 damage vessels, cause immune complexes to lodge in vessels
23 and to thereby interfere with crucial places where
24 vascular supply is important, like the articular surfaces
25 of joints, that it is not at all unreasonable to conceive



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1 that his arthritis had its initiation by vinyl chloride.

2 Q In fairness to you, however, is it correct
3 that there are no epidemiological studies nor any
4 literature studies that you have observed nor patients
5 that you have previously observed that have been able
6 to directly link the exposure to the arthritic disease?

7 A That's true, and, again, in fairness,
8 there seems to have been no published records, at least,
9 follow-up of the people who had the more characteristic
10 Raynaud's phenomenon, reabsorption of distal phalanges
11 and erosive sclerosis of the sacroiliac joint which are
12 typically signs of the vinyl chloride monomer-induced
13 connective tissue disorder, so this really is a place
14 where we lack the evidence, because the evidence has not
15 been looked for.

16 It's an answerable question. It's just
17 that it has not been answered, so far as I am aware
18 or have been able to find, and apparently so far as
19 Dr. Rosenberg was able to find, also.

20 Q So in summing up the question of the
21 arthritis, would it be correct that we have it is
22 established in the scientific medical literature that
23 the connection between the vinyl chloride exposure and
24 cancer can exist; that the connection between vinyl
25 chloride and small airways disease can exist; that the



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1 connection between cancer -- I mean -- excuse me --
2 between vinyl chloride exposure and neurological damage
3 can exist; that Glen has been demonstrated to have two of
4 those problems and has, by history, in your hypothesis
5 been exposed, and that within six to seven years of
6 that, of the extent of that gross exposure, developed an
7 additional severe arthritic condition which has not been
8 linked through medical studies to vinyl chloride exposure?

9 MR. CARLSON: Objection. Foundation;
10 vague, overbroad, speculative.

11 Q [By Mr. Unglesby] And that the most you
12 could say about that is that if you look at the complex
13 set of symptoms, it is possible there is a connection,
14 but from a medical perspective you are not prepared to
15 say that it is more likely than not that there is
16 a connection?

17 MR. CARLSON: I apologize for interrupting
18 you. I thought you had completed the question, but I
19 will --

20 MR. UNGLESBY: That's okay.

21 MR. CARLSON: I will interject the same
22 objection. Speculation.

23 A I think that summarizes the way I would
24 put it together, having gone back and reviewed with care
25 everything I could find in the literature concerning the



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1 connective tissue disorder connected to arthritis, that my
2 opinion now is, as stated, that it is quite conceivable,
3 but we don't have the evidence on which to base a firm
4 conclusion the causation is established or the causal
5 relationship has been established.

6 MR. UNGLESBY: Mr. Carlson, I am finished.

7 [Discussion held off the record.]
8

EXAMINATION

9
10 BY MR. CARLSON:

11 Q Doctor, are you an expert in the area of
12 rheumatology?

13 A Well, I have training for the boards in
14 internal medicine and rheumatology, so I don't know quite
15 how to answer you.

16 I'm not a subspecialist rheumatologist.

17 Q Well, that is what I'm getting at. There
18 is a subspecialty in rheumatology under the internal
19 medicine boards.

20 A I believe there is.

21 Q And you are not certified as
22 a subspecialist within that area?

23 A No.

24 Q You are not a neuropsychologist?

25 A No.

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1 Q There is a separate discipline of
2 neuropsychology, is there not?

3 A Well, there are people who call themselves
4 neuropsychologists. Most of them were trained in
5 psychology.

6 Q They have studied neuropsychology?

7 A Yes.

8 Q Doctor, you are not board-certified in
9 the area of toxicology?

10 A Well, until recently there haven't been
11 boards in toxicology. Whether the board is going to stay
12 alive or not is anybody's guess; but I am not.

13 Q And you have no subspecialty in the area
14 of -- Let me withdraw that.

15 Doctor, the Oschner Clinic, are you
16 familiar with that?

17 A Yes, I am.

18 Q It is in Louisiana?

19 A Yes.

20 Q What is the reputation of that clinic, if
21 you know?

22 A For what?

23 Q For medical evaluation.

24 A Well, it is a large multispecialty clinic.
25 I think they are reasonably reputable. I haven't heard



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1 anything to the contrary.

2 Q I mean nationwide they have got a good
 3 reputation; it is recognized as a leading medical center?

4 A Yes.

5 Q Okay. Now, Doctor, turning to your report,
 6 you have seen the plaintiff on one occasion?

7 A Yes.

8 Q And you have had no follow-up with the
 9 patient since that time that you met with the patient on
 10 June 20, 1989?

11 A That's right.

12 Q How was the patient referred to you?

13 A From Mr. Unglesby.

14 Q The plaintiff's attorney in this case?

15 A Yes.

16 Q What was the purpose of the examination,
 17 for evaluation for the lawsuit?

18 A Well, the purpose was evaluation at that
 19 time. I don't know what the status of the lawsuit was.

20 Q Had there been a lawsuit filed?

21 A I don't know.

22 Q And he referred his patient to you --
 23 his client to you for evaluation of the patient's lung
 24 condition; is that right?

25 A Well, it was for his lung and other



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1 conditions that might be occupationally related.

2 Q Well, I am referring to the first paragraph
3 of your report, Doctor, that says, "This patient was seen
4 on June 20, 1989, at the Southern California Environmental
5 Medical Clinic at Long Beach to evaluate his lung
6 condition," period.

7 Was that the purpose of the evaluation?

8 A Well, I think that is kind of a pretty
9 standard sentence that we use in the clinic. Sometimes
10 it is not quite appropriate, as there was more involved
11 than just his lung evaluation, as you know.

12 Q Under the Occupational History section
13 there is an indication that he was engaged in his work
14 for Dow for twelve hours a day from 1970 to 1974.

15 Where did you get that information?

16 A From him.

17 Q And he told you that he had worked twelve
18 hours a day filling barges from 1970 to '74?

19 A Well, I would think that was up to twelve
20 hours. I may have --

21 Q It doesn't say that, though, does it?

22 A No. It says twelve hours.

23 Q And the statement, "He was provided no
24 respiratory protection," where did that information com
25 from?



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A From him.

Q If in fact the situation were such that respiratory protection was used, would your opinions be any different in this case?

A Well, it would depend on what was used. Short of an air supply respirator, no.

Q So short of that, if any other type of respiratory protection equipment were used, your opinions would all be the same?

A Yes.

Q What TLV was the plaintiff exposed to?

A All right. That is a nonsense question, as far as I can understand. I don't -- Are you asking for the level of vinyl chloride he was exposed to? Because a TLV is a threshold limit value, and in the context of this question it has no meaning.

Q Okay. Let's go back and approach it a different way.

Do you have any quantification on his exposure to vinyl chloride monomer?

A I know of no measurements that were made, if that is what you are trying to ask.

Q Isn't it important to know the exposure level of a chemical before a doctor gives an opinion on potential ramifications of exposure?



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1 A Well, it would certainly be nice if there
2 were that information, but about nine times out of ten
3 to ninety-nine out of a hundred that information is not
4 available, so, practically, it is so seldom available that
5 it is rarely able to be considered because of its absence.

6 Q So, in short, you have no figures on the
7 level of exposure; is that correct?

8 A That's right.

9 Q And the only information you have regarding
10 the duration of exposure is what is contained in your
11 report?

12 A Well, that summarizes it. There was more
13 information in the store he gave me, but I have summarized
14 it.

15 Q What other information do you have
16 regarding the level of exposure other than what is
17 contained in your report?

18 A Well, we have no information about level of
19 exposure. I thought we had established that two or three
20 questions ago.

21 Q I don't think you were listening to my
22 question. I was talking about duration.

23 A But you asked about level, and I am
24 pointing out to you that if you are asking about duration
25 now you have changed your horses, so which one are you



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1 asking about?

2 Q Okay. Let's start over again and make sure
3 we are talking about the same thing.

4 A Well, just be sure the language you use is
5 what you are intending.

6 Q Doctor, I am not here to argue with you.
7 I am here to get some information. We are trying to find
8 the truth.

9 A Well, we can look back in the record if you
10 don't think you were asking about level of exposure, but
11 you were, so if you now want to ask about something els ,
12 please go ahead.

13 MR. UNGLESBY: I will be glad to stipulate
14 that Dr. Kilburn does not know any level or extent of
15 exposure. All of his information is historical, and if
16 what Mr. Smith has told him is incorrect, then that would
17 obviously affect that portion of his opinion, and I think
18 it was clear in the way I questioned him. If it wasn't,
19 it should have been, that his knowledge of what Smith's
20 exposure was has come solely and completely from Smith.

21 MR. CARLSON: Okay.

22 Q [By Mr. Carlson] Now, with respect to the
23 duration of exposure, do you have any other information
24 regarding the duration of exposure by the plaintiff other
25 than what is contained in your report?



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1 A No.

2 Q The information that you have regarding
3 the nature of the plaintiff's employment after 1974, where
4 did that come from?

5 A From him.

6 Q And the information about he being a member
7 of the Dow Response Team to railroad spills and derailment
8 of chemical cars, where did that information come from?

9 A From him.

10 Q Did he indicate to you the frequency when
11 he would participate in that activity, if any?12 A Well, as I recall, it was, you know, highly
13 variable, from once or twice a year to every month or so.
14 I don't recall anything beyond that.15 Q Do you have anything in your file on this
16 plaintiff other than your report which consists of five
17 pages and then three pages of tables?

18 A Yes.

19 Q May I see it?

20 THE WITNESS: While you are doing that, can
21 I take a short break?

22 MR CARLSON: Sure.

23 [Recess taken.]

24 Q [By Mr. Carlson] When you examined the
25 plaintiff on June 20, 1989, there is an entry in your

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1 report for a physical examination. "The plaintiff
 2 appeared in no acute distress." Is that correct?
 3 A Yes.
 4 Q You examined his lungs at that time?
 5 A Yes.
 6 Q His breathing was normal?
 7 A Yes.
 8 Q Moves air well?
 9 A Yes.
 10 Q Breath sounds normal?
 11 A Yes.
 12 Q Breath sounds of normal duration?
 13 A Yes.
 14 Q No adventitial sounds?
 15 A That's right.
 16 Q You also performed a neurological physical
 17 examination?
 18 A Yes.
 19 Q His reflexes were active and symmetrical?
 20 A Yes.
 21 Q The 4-plus upper and lower, what does that
 22 indicate?
 23 A Well, they are actually hyper, hyperactive.
 24 It is a minimal stimulus is enough to elicit all of his
 25 reflexes.



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- 1 Q His muscle strength was normal?
- 2 A Yes.
- 3 Q And symmetrical sensations grossly intact?
- 4 A That's right.
- 5 Q Chest x-rays were done?
- 6 A Yes.
- 7 Q And they were suitable quality for your
- 8 evaluation?
- 9 A Yes.
- 10 Q He displayed normal lung fields?
- 11 A Yes.
- 12 Q And there were no pleural abnormalities?
- 13 A That's right.
- 14 Q Now, Doctor, with respect to your findings,
- 15 which of the pulmonary tests are in your opinion the most
- 16 important for assessing small airway obstruction?
- 17 A Well, the most standard one is the
- 18 FEF 2575.
- 19 Q Could you interpret your findings based
- 20 upon that?
- 21 A Well, the numbers are reduced, which is
- 22 evidence of obstruction, and of, in all probability, air
- 23 trapping, because that is the consequence of that type of
- 24 obstruction.
- 25 Q With respect to the forced expiratory flow,



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1 2575, he performed at 60 percent; is that --

2 A Of his predicted, yes.

3 Q And his predicted is based upon what?

4 A His sex, race, height, and age, and in
5 a nonsmoker, absence of cigarette smoking.

6 Q So this is compared against another
7 population, if you will, of not any prior PFTs?

8 A Well, I had no access to prior PFTs, so it
9 is compared to a standard population.

10 Q And there are individual differences in the
11 force expiratory flow test?

12 A I'm sorry, I don't know what you mean.

13 Q Let me withdraw the question.

14 With respect to someone's lung capacity,
15 there are individual variations; is that correct?

16 A Yes.

17 Q And is there any factor of patient
18 compliance in the FEF 2575?

19 A Well, compliance is with making a
20 spirogram, and efforts to give it anything but a full
21 force expiration are pretty easily detected and usually
22 apparent to the technician who is doing the job.

23 Q But, in other words, if a patient wanted
24 to, a patient could not just blow out all of the air in
25 the lungs; right?



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1 A Well, that's possible, but what is done is
2 a series of tests are done, and they must duplicate within
3 5 percent, and it is very hard to vary it volitionally and
4 come that close, so even an expert would find it difficult
5 to give less than a full effort and get a duplication of
6 that effort in multiple tries.

7 Q Were -- The PFTs that were run, were they
8 run by a technician --

9 A Yes.

10 Q -- in your office, not by you personally?

11 A That's right.

12 Q Would the patient's arthritis affect th
13 FEF 2575?

14 A No.

15 Q What about pain from the arthritis in th
16 back area, would that have an effect on it or could it
17 have an effect on it?

18 A Well, if it is painful to take a full
19 breath, then the forced vital capacity might be reduced,
20 but everyone agrees in the fraternity of pulmonary
21 function the flow rates are not effort-dependent; they
22 are actually dependent on the caliber of the airways
23 rather than on effort, so they are pretty clearly
24 independent of whether or not a full breath is taken.

25 Q How would you characterize the extent of



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1 the small airway obstruction that you found in the
2 plaintiff? And by that I mean mild, moderate --

3 A It's moderate.

4 Q Do you have any view as to when the onset
5 of the small airway obstruction occurred?

6 A No, there is no way that -- with the
7 information that I have at the moment.

8 Q Is there a latency period that you would
9 expect to occur if in fact the small airway obstruction
10 was caused by exposure to vinyl chloride monomer?

11 A Well, the latency is very short. It is
12 like other chemical exposures which I have mentioned such
13 that effects on occupational groups have been seen, you
14 know, when the studies were performed, which was while
15 people were in exposure and when they had relatively brief
16 exposure; by that I mean a few years, not twenty or thirty
17 years.

18 Q You were involved in the train derailment
19 in Livingston Parish?

20 A Well, I wasn't involved with the
21 derailment, no.

22 Q Okay. Let me withdraw the question.

23 You were involved as a plaintiff's expert
24 in the Livingston Parish train derailment where there was
25 a release of vinyl chloride?



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A Yes.

Q Was it the same plaintiff's attorney who you are working with on this case?

A Yes, it was.

Q Do you remember when that spill occurred?

A I can't be sure offhand. I'd guess 1981 or something of that sort.

Q Are you aware that the plaintiff in this case was also a plaintiff in that class action?

A No, I wasn't.

Q Are you aware that he claimed acute exposure to vinyl chloride as a result of that derailment because of the proximity of his residence to the derailment?

A No, I didn't know that.

Q If that were the fact, wouldn't it be more likely that the onset of small airway obstruction would be as a result of that derailment as opposed to his exposure from 1970 to '74?

A Well, without more information, I'd hav to say no, I don't think so.

Q What more information would you need?

A Well, if any medical information suggested he had acute symptoms after the derailment.

Q If there were such evidence, then your



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1 opinion may be different?

2 A Well, I doubt it.

3 The people I have examined from that
4 derailment have not had significant airways disease, so
5 so far I don't have any experience with airways disease
6 from that episode, the derailment episode.

7 Q Do you have any ongoing doctor-patient
8 relationship with the plaintiff?

9 A No, I have not seen him again.

10 Q What medical records of the plaintiff have
11 you reviewed prior to your examination of the plaintiff on
12 June 20th of '89?

13 A I didn't review anything prior to my
14 examination.

15 Q Would you expect that if the plaintiff were
16 complaining of those complaints which are contained in the
17 Review of Systems in your report on Page 2 -- Well, let me
18 back up and ask you: Under the Review of Systems, it says
19 general headaches, dizziness, fatigue, chills, fever, and
20 thirst.

21 Does that mean that at the time that he
22 presented on June 20, '89, that is the way he felt on that
23 day?

24 A No.

25 Q Well, what does that mean, then?

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1 A Well, the way the question is asked, it's
2 "While at work have you experienced more than once a month
3 any of the following?" And those symptoms were based on
4 his answer to that question.

5 Q Now, does that -- Would that be the same
6 time period and the same type of a question for all of the
7 other systems that are listed under Review of Systems in
8 your report on Page 2?

9 A Yes.

10 Q Now, under the "Respiratory History," what
11 does that mean? Does that mean how he presented on June
12 20th?

13 A No. Well, yes and no. That is his
14 history, so up until June 20th that is what he reported.
15 It's not meant to be today or the past week; it's meant to
16 be his history, history in total.

17 Q With the information that he gave you
18 regarding his respiratory history, are you aware of
19 whether that same type of information has been reported
20 to any other treating doctor of Mr. Smith's?

21 A No, I'm not.

22 Q Would you expect those complaints to be
23 significant enough that if he had those complaints that
24 they would have been reported to prior doctors?

25 A Well, you are asking me to do all kinds of



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1 speculation. I really don't know.

2 Q But this type of information was important
3 to you in assessing his lung function; is that correct?

4 A Well, it helps to know what the symptoms
5 are. You sort of -- When you assess function, you measure
6 function, and we measured it, and we have talked about it
7 already, so --

8 Q Right.

9 A -- it's not -- If you mean is this
10 important in assessing his overall respiratory condition,
11 the answer is yes. It isn't helpful in assessing his lung
12 function, which we do with objective testing.

13 Q And you would expect that if a patient is
14 suffering from the type of matters that are listed under
15 the Respiratory History that this would be significant
16 enough that he would give this information to an examining
17 and treating doctor, would you not?

18 A Well, I guess my expectation would be that
19 it would be elicited if asked for. You have asked about
20 giving it to -- If questions aren't asked, you often don't
21 get information.

22 Q Okay. Now, on Page 4 of your report under
23 "Diagnosis/Continued," if other symptoms include loss of
24 balance, fatigue, insomnia, irritability, depression,
25 recent memory loss, lack of concentration, headaches,

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1 dizziness, and unusual acceleration --

2 A Exhilaration, e-x-h-i-l instead of a-c-c.

3 Q That was one of my questions. So that is
4 a typo?

5 A Yes.

6 Q And these symptoms that you have listed
7 here were of assistance to you in your overall diagnosis?

8 A Well, they -- obviously, they correlate,
9 usually, with testable deficiency.

10 It is unusual that people don't recognize,
11 for example, that they have memory loss when they do. Some
12 people who have extraordinarily bad memory loss aren't
13 aware of it, but usually the brain is pretty facile at
14 recognizing its own problems.

15 Q These were symptoms that you found
16 important in your overall evaluation of the plaintiff;
17 is that correct?

18 A Yes.

19 Q Would you expect that if a patient
20 presented to another physician with these same types of
21 problems for an evaluation that the patient would tell
22 those doctors about these symptoms?

23 A Well, again, I don't know. How could I
24 place myself in his position?

25 Q But, normally, if someone comes in for

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1 an evaluation, such as a patient, and has problems with
2 fatigue, insomnia, irritability, depression, and memory
3 loss, lack of concentration, you would expect the patient
4 to tell the doctor either by means of listing them in
5 the history section of the initial form or by telling
6 the doctor orally that these are the symptoms, these are
7 the problems that I have?

8 A No, I don't think you can say that. You
9 know, we -- I specifically ask about those things, and I
10 determine what I have said on the basis of the question.
11 I can't tell you what might be.

12 Q Well, then I wasn't clear. So, in other
13 words, you asked him if he had these conditions; he didn't
14 volunteer to you that, "Doctor, this is the way I feel:
15 I feel tired, I don't sleep well," et cetera. Is that
16 right?

17 A Well, the paragraph we are talking about
18 came from questioning him. I don't have an independent
19 recollection of how many of these things he complained of
20 when I first spoke with him.

21 Q These tests which we refer to as the
22 neurobehavioral tests, who administered them?

23 A I did.

24 Q Was there any neuropsychologist involved in
25 administering them?

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- 1 A No.
- 2 Q Was there any neuropsychologist involved in
- 3 the interpretation of the test results?
- 4 A No.
- 5 Q Doctor, under Table 1 it says "Choice
- 6 Reaction Time/Eye-hand coordination motor speed," and the
- 7 source is Kilburn, with references 11 and 16.
- 8 What do the references refer to?
- 9 A Well, this is a reference list that goes
- 10 along with this table. It is actually the reference list
- 11 out of the paper which I referred to on the firemen. The
- 12 reference, I think, is 158 in my CV.
- 13 Q So both 11 and 16 refer to 158 on your CV?
- 14 A Yes, as do all the numbers under the
- 15 Reference column.
- 16 Q You would admit that a sample size of
- 17 fourteen controls is a small sample?
- 18 A I don't really know how to answer that.
- 19 Small compared to what?
- 20 It was a sufficient sample size for what we
- 21 were doing with the firemen, and it gave us very reliable
- 22 comparative data, which says that it was an adequate
- 23 sample size.
- 24 Q Well, Doctor, you are not an
- 25 epidemiologist, are you?

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1 A Yes, I have practiced epidemiology for more
2 than twenty years.

3 Q Do you consider yourself an expert in
4 epidemiology?

5 A Yes.

6 Q Are you certified in epidemiology?

7 A There is no certification in epidemiology.

8 Q Are you a member of the American College of
9 Epidemiology?

10 A I am not aware of there being a college.

11 Q Are you aware of any professional
12 organization which recognizes epidemiologists?

13 A Well, there are several. I am a member of
14 the International Epidemiology Association.

15 There is also an American and British
16 Epidemiology Association which I haven't bothered to join.

17 As Mr. Unglesby brought out, I am a member
18 of this international body on neurobehavioral methods in
19 epidemiology, which has been in existence for about twelve
20 years.

21 Q The purpose of using the fourteen controls
22 was to have some baseline data to compare the findings of
23 the plaintiff to?

24 A That's correct, yes.

25 Q And the idea of having a control would be



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1 to have someone that reflects a sampling of the general
2 population?

3 A Not necessarily, no.

4 Q Well, what were you trying to do, then, by
5 using the control for these neurobehavioral tests if not
6 to compare them to someone who was representative of the
7 general population?

8 A Well, the general population includes
9 people in institutions, people in hospitals, children in
10 school, none of which are pertinent for comparing workers
11 to, generally, because of many reasons. Leads to
12 confounding, one of which is the healthy worker effect.
13 You try to compare workers to workers.

14 Now, ideally, you compare, I guess, chemical
15 workers to chemical workers, but for neurobehavioral
16 testing, that is an oxymoron, because you then are likely
17 to dig yourself a comparative ridiculous situation where
18 you don't know which group is, quote, "the referent," so
19 you try to get a referent population that has not had the
20 exposure but has as many characteristics as possible in
21 common with the exposed population.

22 Q Well, you would agree that, generally,
23 firemen are in better physical shape than the average
24 working population?

25 A I don't know that that's true. That's true



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1 when they take their exam to become firemen, but from
2 examining firemen I know it is not true when you look at
3 people spread across up to twenty or twenty-five years of
4 time as a fireman.

5 Q But the ages of the fourteen firemen
6 controls were in the area of 30 to 37?

7 A Well, that's where the mean was in the
8 confidence intervals. There were two or three people who
9 were in the early twenties, and there were, I think, two
10 or three people who were over 40. The oldest one, I
11 think, was 51 or 52.

12 Q But the mean of the ages was 34.9?

13 A Yes.

14 Q And then you compared the plaintiff, who is
15 41 years old with arthritis, to a mean age of 34.9?

16 A Yes.

17 Q Now, of these things that you ran, as I
18 understand it, these pluses mean that the plaintiff was
19 outside of the range of fourteen firemen; is that right?

20 A Well, if you use range to mean confidence
21 intervals, yes.

22 Q Well, outside the confidence intervals;
23 what does that mean to you?

24 A Well, the chances are less than one in
25 twenty that he would be there and be normal.



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1 Q But you would agree that he was normal in
2 most of the categories that you measured than those where
3 he was not normal?

4 A I don't know what you mean by that.

5 Q Well, in other words, just simply look at
6 the list. You have indicated that the pluses mean that
7 he was outside the normal range, and all I am trying to
8 understand here is that it appears to me that he was much
9 more normal than he was abnormal under these various items
10 that you have on Table 2.

11 A Well, are you a neurologist who can equate
12 one of these tests to another, or say they are all equal?
13 Because they are not, and it is part of what the
14 interpretation is based on.

15 Q Okay.

16 A They cluster to describe functions, and
17 there are some things that are in here more or less that
18 faithful performance is occurring, like digits forward and
19 backward.

20 Q Well, let's just take --

21 A And you are counting as normal some of the
22 predecessor information.

23 For instance, I could have marked all of
24 the choice reaction times as being abnormal, which they
25 are. I simply marked it once.



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1 If you are counting lines, then, you know,
2 that would have to be counted the other way.

3 Q Let's approach it simply Story 1, verbal
4 memory is 10-plus; that the range of the plaintiff falls
5 outside of the confidence intervals.

6 Am I interpreting that correctly?

7 A Yes.

8 Q The next line, Story 2, verbal memory, 8;
9 there is no plus. So that means it falls within the
10 confidence interval?

11 A Well, he is right on the confidence
12 intervals.

13 Q But that would be --

14 A I haven't leaned over to call anything that
15 was borderline positive is all that means.

16 Q Sure. That's the only thing I'm trying to
17 do here, Doctor, is to understand it.

18 So under that one, he fell within the
19 normal range?

20 A Well, it is on the border, yes.

21 Q Okay. Next one, Digits Forward, the
22 plaintiff had a 7. He is within the normal range on that;
23 correct?

24 A Yes.

25 You skipped over the next one, which was



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1 Visual Memory, but --

2 Q Well, let's -- Okay. Let's get an answer
 3 to my question.

4 In Digits Forward he is in the normal
 5 range?

6 A Yes.

7 Q Digits Backward he is in the normal range?

8 A Yes.

9 Q Now, what is the significance of when it
 10 says Errors? What does that mean?

11 A Well, it is whether or not in the
 12 performance of his tasks he made errors or not. That
 13 is what it means.

14 Q Now, the next one is Finger Perception; is
 15 that right?

16 A No. It is perceiving numbers on the tips
 17 of the fingers.

18 Q And under Error Writing Left he was within
 19 the normal range?

20 A Yes.

21 Q Embedded Figures, he was within the normal
 22 range --

23 A Yes.

24 Q -- correct?

25 A Yes.



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1 Q Under Reaction Times, Simple 1, he was in
2 the normal range?

3 A Well, we don't have ranges from the
4 firemen, so we can't really address those three numbers.

5 Q Now, under Balance it says Eyes Open 1. He
6 was within the normal range?

7 A Yes.

8 Q And Eyes Open 2, he was within the normal
9 range?

10 A No. That is outside the confidence
11 interval.

12 Q Eyes Closed, he was within the normal
13 range --

14 A Yes.

15 Q -- for 1 and for 2?

16 A Yes.

17 Q And this is in spite of his arthritic
18 condition; is that correct?

19 A Yes.

20 Q The Digit Symbol, 46, that is normal?

21 A Well, again, I don't have comparative
22 information for the firemen.

23 Q The Information, 25, that is normal?

24 A Yes.

25 Q Similarities is normal?



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- 1 A Yes.
- 2 Q Picture Completion is normal?
- 3 A Yes.
- 4 Q And I believe, as you have indicated in the
- 5 third page of your chart, for Tension, Anger, Depression,
- 6 Vigor, Fatigue, Confusion, all of his scores were in the
- 7 normal range?
- 8 A Yes.
- 9 Q These neurobehavioral tests, the way you
- 10 have put them together, the first time that they will be
- 11 published will be through this publication in the British
- 12 journal; did I understand you correctly?
- 13 A No.
- 14 Q No. What is it that is being published in
- 15 the British journal?
- 16 A It is a description of a knee apparatus
- 17 that we devised for measuring balance or sway speed.
- 18 Q So these tests that you have run comparing
- 19 individuals to the firemen, has that been published any
- 20 place?
- 21 A Well, as I have said three or four times,
- 22 the firemen paper was published in 1989. I gave you the
- 23 reference. It is in my CV.
- 24 Q Let me make my question clearer. I
- 25 understand that you have published the firemen studies



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1 as No. 158 on your CV.

2 My question is: Using that, the firemen,
3 as a reference group and then comparing other individual
4 patients or plaintiffs in lawsuits, have you published
5 that anyplace?

6 A Here, what do you mean by "published"? You
7 have got me totally --

8 Q Published in a medical or scientific
9 journal.

10 A That's -- I'd have to say no because I
11 don't understand the question very well.

12 Q Well, let me see if we can't communicate on
13 this.

14 I am just trying to determine, Doctor, if
15 you are using the firemen as a control group and then you
16 take the individual plaintiff in a lawsuit and you compar
17 them to the firemen and come up with these scores, has
18 that methodology protocol, if you will, been published any
19 place, medical journals or scientific journals?

20 A Well, there is a paper on, again,
21 a Louisiana man who was exposed to hydrogen sulphides,
22 which will be published in the fall in the American
23 Journal of Medicine; also listed in my CV is such
24 a description.

25 Q What number is that in your CV?



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1 A Hand it to me and --
 2 Q Okay.
 3 A It is No. 4 listed under "In Press."
 4 Q Okay. Let me make sure that we understand.
 5 I asked you whether you had published. You
 6 have one in press.
 7 Do you have any published?
 8 A We have gone through that, really, Jeff.
 9 The firemen paper is published. I have
 10 a preceding paper about histology technicians. I have
 11 said what I have said, and In Press represents that it has
 12 been accepted. It is somewhere between the typesetter and
 13 the printer and the publisher at the present time.
 14 Is it available? Well, not from the
 15 Journal yet, because they only have it available once
 16 they have formally published it, but it has gone through
 17 all the steps taking it to that point.
 18 Q Have you published any papers dealing with
 19 an evaluation of a plaintiff exposed to vinyl chloride
 20 monomer using the firemen as control groups?
 21 A No.
 22 Q Have you published specifically on any
 23 studies that you have done with vinyl chloride monomers?
 24 A No.
 25 Q You were asked if you have qualified as an



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1 expert in Louisiana courts. Which cases?

2 A Well, the first one was one concerning
3 Terry Wisner and the Illinois Central Railway -- Illinois
4 Gulf Railway, I guess it is.

5 Q Any others?

6 A Well, a case that concerns Livingston
7 Parish and multiple defendants -- not Avingdale -- What's
8 the name?

9 MR. UNGLESBY: The name of that case is
10 Combustion. That's what that will mean to the people when
11 you send it back home..

12 Q [By Mr. Carlson] That's with the same
13 plaintiff's attorney as in this case?

14 A Yes.

15 Q And the Wisner case, is that with the same
16 plaintiff's attorney?

17 A Yes.

18 Q Any other cases where you have testified
19 and qualified as an expert in Louisiana?

20 A Yes. A case that's right now on the court
21 calendar in New Orleans concerning hydrogen sulphide
22 exposure.

23 Q Do you remember the name of the lead
24 plaintiff in this case or of the plaintiff?

25 A Well, I remember it. I don't know that I



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1 should reveal it at this point. I will if --

2 MR. UNGLESBY: You can go ahead.

3 A [Continuing] Steve Borque.

4 Q [By Mr. Carlson] I am sorry? York?

5 A Borque.

6 Q Borg?

7 A B-o-r-q-u-e.

8 Q Is that with the same plaintiff's attorney
9 as in this case?

10 A No.

11 Q When you said that you would not expect
12 this plaintiff to even be able to walk up a flight of
13 stairs, words to that effect, when did that begin?

14 A I don't know.

15 Q The studies which you mentioned by Monson
16 & Peters regarding cancer risk, you would agree that the
17 workers that those studies covered were vat cleaners with
18 PVC?

19 A That group was included, but it included,
20 I think, a vast number of production workers, handlers,
21 transporters, as well.

22 Q But wasn't the cancer found in the vat
23 workers and not any other handlers of PVC?

24 A I don't think it was broken down. I
25 haven't looked at the tables for some time. I don't think



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1 it was subdivided by subdivisions of category of work.

2 Q Well, you are familiar with the
3 epidemiology studies which have shown cancer, but the
4 cancer has been limited to those vat workers with the PVC
5 where there was essentially hand-scraping of the vats?

6 A Well, I think that applies to the
7 angiosarcomas, but this study was a much broader study,
8 as was the German one that I referred to.

9 Q Now, with respect to the element of the
10 risk of cancer, there was no mention of that in your
11 report, was there?

12 A No.

13 Q And you didn't discuss that with the
14 plaintiff at the time, did you?

15 A There would have been no reason to, so I
16 probably did not.

17 MR. CARLSON: Makes it seem like you are
18 not interested in what I have to say.

19 MR. UNGLESBY: Oh, no, no. I can't do
20 anything about what you have to say, Jeff, so I just enjoy
21 listening.

22 Q [By Mr. Carlson] Have you read any of the
23 depositions in this case?

24 A I have looked at some of the workers'
25 depositions, co-workers' depositions; that's all I have



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1 looked at to this point.

2 Q Co-workers in this particular case?

3 A Yes.

4 Q Do you remember their names?

5 A No.

6 Q You have not reviewed any of the doctors'
7 depositions?

8 A No.

9 Q Have you reviewed any of the medical
10 reports from the occupational health group at Oschner
11 headed by Dr. Swift?

12 A No.

13 Q Do you know Dr. Swift?

14 A I don't think so.

15 Q He is head of the occupational group in
16 that area.

17 A Well, if you say so. I don't know, so...

18 Q I'm just trying to see whether that
19 refreshes your recollection of whether you know him.

20 A I knew Dr. Alexander, who was his
21 predecessor. I know one of the people, a woman in
22 the clinic whose name escapes me. Swift, if I met, I
23 don't recollect.

24 Q Would you feel that would be important to
25 your overall evaluation to determine what was reported by

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1 those physicians who tested the plaintiff?

2 A You mean would it change my opinion?

3 Q No. Just whether it would be information
4 that you would like to have available to you.

5 A May or may not be of interest. I don't
6 know.

7 Q Well, generally, you would like to have
8 as much information on a patient as you can in order to
9 properly evaluate the condition of the patient?

10 A Well, most evaluations are made on fairly
11 limited information, which is, you know, what one can
12 assemble at a point in time.

13 There is always more information possible,
14 but how much of that one contributes to a decision or
15 recommendation is hard to tell.

16 Q But as a general rule, you would want to
17 know as much about a particular patient before you arrived
18 at a diagnosis, isn't that correct, the patient's medical
19 background and concurrent evaluations by other physicians?

20 A Well, it depends on what the questions
21 being asked are.

22 Q With respect to the causation of the
23 plaintiff's claims.

24 A Well, as I say, it may or it may not be
25 helpful or contributory.

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1 Q Would it be helpful, Doctor, in determining
2 the neurobehavioral facts that you have listed on Table 2
3 to know the previous history that the patient had given
4 regarding these neurobehavioral aspects?

5 A I don't know what you mean by that.

6 Q Well, would it be helpful for you to know
7 about the neurological testing which occurred prior to
8 the time that you examined the patient on June 20, 1989?

9 A I think that would be interesting, yes.

10 Q To your knowledge, has any other doctor
11 who has seen the plaintiff picked up any of these
12 neurobehavioral problems that you have seen?

13 A I don't know.

14 Q Did you do any nerve conduction testing?

15 A No.

16 Q Did you run an EMG?

17 A No.

18 Q Would a patient's history of asthma be
19 something that you would want to know about in assessing
20 the causation of small airways obstruction?

21 A Yes.

22 Q Is asthma something that is thought to be
23 hereditary?

24 A Well, not in a direct sense, no.

25 Q Well, there is some literature out ther

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1 that suggests there may be a hereditary component to
2 asthma.

3 A Well, I think you are confusing hereditary
4 and familial. There is some evidence that there is
5 a familial increased likelihood of having asthma, but
6 it is not a hereditary disease like muscular dystrophy
7 or cystic fibrosis or --

8 Q So just to be more precise, what we are
9 talking about is a family predisposition, if you will?

10 A Well, it may be that, yes.

11 Q Would that type of information be something
12 that you would like to know about in assessing the
13 causation of the plaintiff's small airway obstruction?

14 A Well, it would be of interest, yes.

15 Q Doctor, do you keep any lists of your
16 testimony history?

17 A No.

18 Q Do you testify extensively?

19 A I testify when I can't get out of it.

20 Q Okay. Can you give us an indication of how
21 many times you have testified in trial and how many times
22 you have testified in depositions?

23 A More in the neighborhood of fifty times in
24 trial and a hundred in deposition.

25 Q Over what time frame?



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1 A Twenty years.

2 Q And of these hundred and fifty times that
3 you have given testimony, would it be correct to say that
4 most of those have occurred within the last five to ten
5 years?

6 A Most have been in the last ten or eleven
7 years, yes.

8 Q And of the one hundred fifty or so times
9 that you have testified, what percentage of those one
10 hundred fifty times have been for the plaintiff?

11 A All but one or two.

12 Q What percentage over the last five years of
13 your income is made from medical-legal matters?

14 A 15 percent in the last five years.

15 Q How about in the last ten to eleven years?

16 A It would be considerably less than that.

17 Q What is your current hourly charge for
18 giving deposition testimony?

19 A \$350 an hour.

20 MR. CARLSON: Just give me a few minutes
21 to --

22 THE WITNESS: Sure.

23 MR. UNGLESBY: We can go on the record, in
24 case we have a problem with the Xerox, that Mr. Carlson
25 has requested Dr. Kilburn's file, and in the event it

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1 can't be copied at any kind of a reasonable time here,
 2 I will go through it very quickly so it will be copied
 3 and sent to Mr. Carlson.

4 We have a Confidential Asbestos
 5 Questionnaire that consists of five pages.

6 You have a typed questionnaire that says
 7 "L. G. Smith, 6/20/80, Physical Exam," consists of one,
 8 two, three page; Pulmonary Associates, by Mr. D-a-t-t-a,
 9 M.D. in Long Beach, California, three pages.

10 Physical and Behavioral Symptoms Inventory,
 11 consists of multiple pages --

12 THE WITNESS: No. It is just the top page.

13 MR. UNGLESBY: Well, behind it are --

14 THE WITNESS: Notes, mostly.

15 MR. UNGLESBY: -- notes relating to all of
 16 this from Metropolitan Life Insurance Company;

17 Clinical Neuropsychological Battery,
 18 consisting of multiple pages;

19 Southern California Environmental Medical
 20 Clinic admit sheets;

21 Oschner's Clinic, Release of Information
 22 to Dr. Kilburn; letter from Dr. Kilburn to Michael
 23 M-a-d-d-o-l-i-n at Metropolitan Life, which contains the
 24 report written to me; a request from Metropolitan Life for
 25 the report;

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1 Southern California Environmental Medical
2 Clinic intake sheet;

3 Dow Chemical health claim insurance form;
4 and a note that says "Polyarthrititis due to vinyl
5 chloride."

6 And I will go and try to get them copied,
7 but that way we know what they are in case we can't.

8 Q [By Mr. Carlson] Do you have anything else
9 that you have reviewed in connection with this case?

10 A Well, I have got a file like this on vinyl
11 chloride, which, you know, is that --

12 Q Gesturing about eight inches thick?

13 A Yes.

14 Q Did you review that in preparation for your
15 deposition?

16 A Well, I looked through it really looking
17 for the information that I have testified about concerning
18 arthritis, Raynaud's phenomenon, acro-osteolysis, and so
19 forth. I just paged, looked through the file to pull out
20 anything that I thought was relevant to that issue because
21 I was curious after the x-rays arrived as to whether these
22 people had ever been followed up.

23 Q When you say the x-rays, those are the '86
24 and the '91s --

25 A The ones --



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1 Q -- x-rays?
2 A The one that Mr. Unglesby described that
3 he sent to me before this deposition.

4 Q When did you review those?

5 A Oh, I think it was two days ago.

6 Q That is the first time you saw them?

7 A Yes.

8 Q And just prior to this deposition,
9 plaintiff's counsel got here late, you had a meeting.

10 Could you tell us what you discussed?

11 MR. UNGLESBY: No, he can't. He can't.

12 It doesn't have anything to do with Lloyd Smith's cas .

13 It has to do with other cases in Louisiana, and he can't
14 discuss it. That's my work product. That is irrelevant
15 to this case.

16 Q [By Mr. Carlson] Did you discuss anything
17 pertaining to this case or vinyl chloride?

18 A No.

19 Q Did he show you any documents pertaining to
20 this case or vinyl chloride?

21 A No.

22 MR. CARLSON: I have nothing further.

23 MR. UNGLESBY: Thank you. That's all I
24 have.

25 [Discussion held off the record.]

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MR. UNGLESBY: The stipulation in this case, in this deposition, from the Louisiana Code of Civil Procedure, by notice for perpetuation and trial testimony, and Dr. Kilburn will waive his right to read and sign the deposition.

Say "That's right."

THE WITNESS: That's fine.

MR. CARLSON: So stipulated.

[At 12:45 p.m. the deposition was concluded.]

* * *



REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) SS
 COUNTY OF LOS ANGELES)

I, Nancy Maddux, CSR No. 4300, certify and declare:

That the foregoing deposition of KAYE H. KILBURN, M.D. was taken before me pursuant to Notice at the time and place herein set forth, at which time the witness was put on oath by me;

That the testimony of the witness and all objections made at the time of the examination were recorded stenographically by me and were thereafter transcribed;

That it was stipulated by counsel and the witness that the signature of the witness to the said deposition be waived; and

That the foregoing deposition as typed is a true record of the testimony of the witness and of all objections made at the time of the examination.

I certify and declare under penalty of perjury of the laws of the State of California that the foregoing is true and correct.

IN WITNESS WHEREOF, I have subscribed my name this
17th day of August, 1991.

Nancy Maddux

Nancy Maddux, CSR No. 4300

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1		
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Lloyd Owen Smith 1

CURRICULUM VITAE

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S.S.# 529-36-6955

Present Position:

Ralph Edgington Professor of Medicine,
University of Southern California
School of Medicine
Director of Environmental
Sciences Lab, 1980.
Director, Workers Disease Detection
Services, 1987-
Editor-in-Chief, Archives of
Environmental Health, 1986.

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Born:

September 20, 1931 - Logan, Utah

Marital Status:

Married Gerrie Griffin, 1954
Three children

Education:

University of Utah, B.S.
(Honors), 1951.
University of Utah, School of
Medicine, M.D., 1954.

Postgraduate Training:

Rotating Intern, St. Mark's
Hospital, Salt Lake City, Utah
April - June, 1954.
Intern-Medicine, University Hospitals,
Cleveland, Ohio, 1954-55.
Assistant Resident-Medicine
University of Utah Hospitals
Salt Lake City, Utah, 1955-56.
Resident-Pathology and Medicine,
Veterans Administration Hospital,
Salt Lake City, Utah, 1956-57.
Research Fellow in Medicine,
Duke University Hospital,
Durham, North Carolina, 1957-58.
American Trudeau Society Research,
Fellow, 1958.

Smith 6x1
Wit: Kilburn, M.D.
8-2-91
mm 4300 1

Postgraduate Training Cont: U.S.P.H.S. Research Fellow with
Dr. Paul Wood, Cardiac Department,
Brompton Hospital, London,
England, 1960-61.
Sabbatical, 1968-Cell biology and
ultrastructure, J. David
Robertson, M.D., Professor of
Anatomy, Duke University, U.S.P.H.S.
Special Fellowship.
Research Career Development Award,
NIEHS, 1969-1973.
Certified American Board of Internal
Medicine, 1963.
American Board of Preventive Medicine
(Occupational Health) 1983.

Military Service: Chief, Surgery Branch, Physiology
Division, U.S. Army Medical Research
and Nutrition Laboratory.
Fitzsimmons General Hospital.
Denver, Colorado, 1958-60.

Academic Positions Held:

Clinical Instructor in Medicine, University of Colorado, 1959-60.
Senior Registrar in Cardiology Department, Brompton Hospital,
London University, 1960-61.
Instructor in Medicine, Director, Cardiopulmonary Division,
Washington University School of Medicine, 1960-62.
Assistant Professor, Washington University, 1962.
Assistant Physician, Barnes Hospital, St. Louis, Missouri, July,
1961-62.
Associate Professor of Medicine, Duke University, 1962-69.
Chief, Medical Service, Veterans Administration Hospital, Durham,
North Carolina 1963-68.
Director, Division of Environmental Medicine, Department of
Medicine, Medical Center, 1968-73.
Consultant, Durham Veterans Administration Hospital, Fayetteville
Veterans Administration and Oteen Veterans Administration
Hospital, North Carolina, 1968-73.
Recipient of Research Career Development Award 1-K4-ES-8111 from
the National Institute of Environmental Health Sciences, June,
1969.
Associate Professor of Medicine and Assistant Professor of
Anatomy, Duke University, 1969-70.
Professor of Medicine and Assistant Professor of Anatomy, Duke
University, 1970-73.
Professor of Medicine, Associate Professor of Anatomy, University
of Missouri-Columbia 1973-77. Director, Division of Pulmonary
and Environmental Medicine, 1973-77.

Academic Positions Held Cont'd:

Professor of Medicine and Professor of Community Medicine,
Environmental Sciences Lab, Mt. Sinai School of Medicine, 1977-80.
Professor of Medicine, University of Southern California, 1980-
Director, Barlow Occupational Health Center, 1982-1984.
Chief, Pulmonary and Environmental Medicine Section LAC-USC
Medical Center, 1982-1984.

Administrative Experience:

1958-1960	Directed Surgical Division of U.S. Army Medical Research and Nutrition Laboratory - Fitzsimons General Hospital, Denver, Colorado.
1960-1961	Senior Registrar British Health Service, Brompton Hospital, University of London.
1961-1962	Director, Division of Cardio-respiratory Medicine, Washington University, St. Louis, MO.
1962-1968	Chief, Medical Services, Durham Veterans Administration Medical Center of Duke University Medical Center, Durham, NC.
1968-1973	Director, Division of Environmental Medicine, Duke University Medical Center, Durham, NC.
1973-1977	Director, Pulmonary and Environmental Medicine Division, Department of Medicine, University of Missouri-Columbia, Columbia, MO.
1977-1980	Chief of Research, Pulmonary Division, Member Environmental Sciences Laboratory and Chief, Pulmonary Disease Service, Bronx VA Hospital, Mount Sinai School of Medicine.
1980-1984	Founding Director, Barlow Occupational Health Center, University of Southern California, Los Angeles, CA.
1980-Present	Director, Environmental Sciences Laboratory, Department of Medicine, University of Southern California, Los Angeles, CA. President and Medical Director, Workers Disease Detection Services Inc., San Dimas, CA.

Professional Societies:

American Association for Advancement of Science.
American Medical Association.
American Thoracic Society, Committee on Therapy 1965-67;
Nomenclature Committee 1972.
American Federation for Clinical Research.
Southern Society for Clinical Investigation.
American Physiological Society.
American Heart Association.
Sigma Xi.

Professional Societies Cont'd:

American Occupational and Environmental Health Society.
American Society for Experimental Pathology.
Central Society for Clinical Research.
American Society for Cell Biology.
International Epidemiological Association.
American Public Health Association.
Western Association of Physicians.
Collegium Ramazzini.

National Committees:

Member, Veterans Administration Pulmonary Disease Research
Evaluation Committee, 1963-69.
Member, Veterans Administration Cardiopulmonary Training
Committee, 1968-75.
Member, American Thoracic Society Committee on Anti-Smoking, 1969-
72.
Member, National Air Conservation Commission, 1970.
Member, Lung Center Grant Review Committee, National Heart and
Lung Institute, 1971.
Member, Ad Hoc Air Pollution Control Office Research Grant review
Committee, 1971.
Member, Pulmonary Academic Award Committee, NHLI, 1974-76.
Member, Research Evaluation Committee, National Cystic Fibrosis
Society, 1974-78, Education Committee, 1977-78.
Member, Advisory Committee to Surgeon General on Paraquat and
other Herbicides, on Marijuana, 1978.
Scientific Advisor to Workers' Institute for Safety and Health
1979.
Member, Committee on Byssinosis, Assembly on Life Sciences,
National Research Council, 1979-1981.
Member, Board of Scientific Counselors, Division of Cancer
Prevention and Control, National Cancer Institute, 1980.

Education Activities:

Microanatomy course - first year medical curriculum, Duke
University.
General medicine - second year ward and outpatient attending.
Lung Pathology - third year.
Environmental Medicine Course (Director) - third year.
Environmental Lung Seminar.
Pulmonary Medicine - fellows and residents.

Symposia Director:

1. Symposium on Structure, Function and Measurement of Respiratory Cilia, Duke University, February 12-14, 1965. Amer. Rev. Resp. Dis. 93: (part 2) 1-184, 1966.
2. An evaluation of Model Systems for Studying the Pulmonary Responses to Inhaled Materials, Bermuda, October 19-21, 1969, Arch. Int. Med. 126:415-511, 1970.
3. Pathogenesis of Byssinosis and Related Vegetable Dust Diseases, Quail Roost, North Carolina, April 1-May 1, 1970.
4. Cotton Dust and Health, Charlotte, North Carolina, May 2, 1970.
5. Hanford Conference on Pollution and Lung Biochemistry, Richland, Washington, June 3-6, 1970.
6. New York Academy of Sciences Symposium on Pulmonary Reactions to Organic Materials, New York City, November 8-11, 1972.
7. Tobacco Smoke Effects on the Non-Smoker, Bermuda, March 27-29, 1974, Co-Director with Dr. Ragnar Rylander.
8. Asbestos Associated Disease, New York City, November 27-29, 1978, Co-Director with Dr. Irving J. Selikoff.
9. International Meeting Monitoring of Exposure to Selected Chemicals and Their Health Effects, Berlin, West Germany, December 13-17, 1982.
10. Chronic Disease in the Workplace and Environment, Workplace Health Fund, Washington, D.C., November 30 - December 1, 1983.
11. International Conference on Health Hazards and Biological Effects of Welding Fumes and Gases. Copenhagen, October 8-12, 1984. WHO-CEC (Planning Committee).

Editorial Responsibilities:

Editorial Board:

American Journal of Physiology, 1973-75.
Archives of Environmental Health, 1970-76. Executive Editor,
1976-85. Editor in Chief, 1986.
Environmental Research, 1970.
Journal of Applied Physiology, 1973-76.

Associate Editor:
American Journal of Industrial Medicine, 1980-

Guest Editor:
American Heart Journal.
American Review of Respiratory Disease.
Annals of Internal Medicine.
Chest.
Journal of Clinical Investigation.

CAREER RESUME

Kaye H. Kilburn, M.D.

Dr. Kilburn received his medical degree from the University of Utah College of Medicine in 1954. He completed postgraduate training in internal medicine at Western Reserve University (internship), University of Utah Hospitals (residency in Medicine and in Pathology), and Duke University (fellowship in cardio-pulmonary disease).

In 1958, he developed a cardiopulmonary research laboratory with a staff of 15 at the U.S. Army Medical Research and Nutritional Laboratory at Fitzsimmons Army Hospital. Both human and animal research was done and six papers were published. Following these two years, he devoted a year to clinical cardiology training with the late Dr. Paul Wood in London, England.

He returned to the United States in 1961 to organize the first cardiopulmonary division for Washington University (at Barnes Hospital), St. Louis. His effect on the house staff was measured by 5 of 20 interns going into pulmonary disease including Dr. Robert Senior, now Chief of Pulmonary Disease, Washington University (Jewish Hospital of St. Louis).

He accepted the challenge from Dr. Eugene Stead to return to Duke in 1963 to organize and head the medical service of the Durham Veterans Administration as an integral partner with Duke Hospital. Faculty were attracted and housestaff training was emphasized. A cardiology section was strengthened and a pulmonary section created including intensive care and research laboratories. Studies ranged from a prospective pathophysiological study of respiratory failure to clearance mechanisms of the lung and ciliary beating. This five year administrative period was balanced by a sabbatical in ultrastructure of the lung with David Robertson in anatomy at Duke.

A new and novel division of Environmental Medicine was developed and organized by Dr. Kilburn at Duke from 1968-73. Its breadth extended from epidemiology of textile workers' lung disease (byssinosis) in cooperation with the North Carolina Department of Health and Burlington, the textile giant, to the basic biology of ciliary beating, lung surfactant, glycoproteins of alveolar proteinosis and effects of inhalants such as cotton dust and cigarette smoke on airway lining cells. The division became a model for scientific solving of societal problems. It had a faculty of 12 and a staff of 25. Ten M.D.'s and Ph.D.'s were trained in environmental medicine including James A. Merchant, M.D., who received a doctorate in Public Health and presently heads the Appalachian Laboratory for NIOSH at Morgantown, West Virginia, and Michael Passero, M.M., head of pulmonary disease at

the University of Rhode Island, and Daniel J. Hurst, head of pulmonary disease at the University of Missouri.

In 1973, Dr. Kilburn went to the University of Missouri to establish the first pulmonary and environmental medicine program. A faculty of six M.D.'s and three Ph.D.'s established full diagnostic services, intensive care, a pulmonary fellowship program, research in connective tissue of lung in response to inhalants and on the causal agent of byssinosis, and a satellite pulmonary training program at the State Chest Hospital with full services.

In 1977, Dr. Kilburn returned to society's environmental and occupational medicine frontier by joining Dr. Irving J. Selikoff in the Environmental Sciences Laboratory at Mt. Sinai School of Medicine in New York. Among his roles was the development of strong "mechanisms of diseases" laboratories as partner to the epidemiological laboratories and encourage basic scientists to attach environmental and occupational health problems. Two of the new programs are addressed to the questions: "Is the lung in utero sensitive to chemical toxins?" and "What is the role of the lungs' proteases in interstitial diseases?"

In 1980, Dr. Kilburn accepted the Ralph Edgington Chair in Medicine at the University of Southern California School of Medicine. The causes of disease in occupational and environmental sectors are the concern of the Environmental Sciences Laboratory under his direction.

In August of 1980, the Barlow-USC Occupational Health Center was founded as a clinical center for the investigation of the adverse health effects of environmental agents. Current projects include control of lung cancer in shipyard workers, asbestos disease in families of shipyard workers, the adverse health effects of welding, the toxicity of fiberglass, the toxicity of formaldehyde in resin users and in histology technicians, histochemical methods for cytology, laboratory models for birth defects and the development of health surveillance programs for workers.

The Pulmonary Division at USC School of Medicine and Los Angeles County-USC Medical Center, with its responsibilities for education, research and patient care, came under Dr. Kilburn's direction in July, 1982. The objectives of this division are clinical investigations of adult respiratory distress syndrome, and of asthma with emphasis on inflammatory responses in the lung. There is a faculty of 12 physicians. The facilities include a 38 bed clinical chest unit with 4 intensive care beds at LAC-USC Medical Center and 50 beds with 6 ICU beds at Barlow Hospital.

Research accomplishments during the 1980-1985 interval included studies of shipyard workers and their household exposed family

members, showed a sizable proportion of wives (11.3%) had signs of asbestosis. These women and their daughters also showed airflow reductions in nonsmokers attributed to Los Angeles air pollution. The repeat study of 330 of these women in June, 1985, four years after the initial study, which is now being analyzed, expected to show further changes due to environmental smog.

A sample of 1,225 Los Angeles school children in 2nd and 5th grades was studied by spirometry and questionnaire for the prevalence of asthma, chronic bronchitis, response to bronchodilators, and effects of household cigarette smoking and smog. In these children, asthma had a prevalence of 6.8% by parental criteria, of 8.3% by physician diagnosis, while 6.6% had wheezing on examination.

A longitudinal study of pulmonary and neurobehavioral effects of formaldehyde shows no evidence of chronic effects on pulmonary function. In fact, the study yields the first useful national group of women. However, 6 of 10 tests in a neurobehavioral battery were reduced when regression analysis was done against hours of formaldehyde (age reduced 8 of 10 tests).

A cross-shift study of welding has shown that stainless steel reduces flow rates during work, but more disturbing, welders had forced vital capacities and forced expiratory volume in 1 sec, 10% below predicted in both nonsmokers and smokers, compared to a smoking specific reference population. Studies continue of effects of asbestos, formaldehyde and solvent exposure, and welding fumes.

Ongoing studies of the effects of chemicals on lung and organ development began in 1974, show further evidence of growth delaying effects of copper deficiency and agents which affect elastin and collagen cross-linking, including disulfuram, beta-aminopropionitrite, and a bis (dichloroacetyl) diamine WIN 18,446.

Kaye H. Kilburn, M.D.

MANUSCRIPTS PUBLISHED

1. Kilburn KH: Massive hepatomegaly and an elevated serum acid phosphatase associated with a retrovesical carcinoma. *Cancer* 11:363-368, 1958.
2. Kilburn KH: Secondary amyloidosis and hepatic failure in Hodgkin's disease. *Am J Med* 24:654-658, 1958.
3. Kilburn KH and Brown H: Anasarca and hypoproteinemia in reticulum cell sarcoma. *Ann Intern Med* 49:1257-1266, 1958.
4. Kilburn KH: The innocuousness and possible therapeutic use of aerosol amphotericin-B. *Am Rev Respir Dis* 80:441-442, 1959.
5. Kilburn KH, Eagan JT and Heyman A: Cardiopulmonary insufficiency associated with myotonic dystrophy. *Am J Med* 26:929-935, 1959.
6. Kilburn KH, Eagan JT, Sieker HO and Heyman A: Cardiopulmonary insufficiency in myotonic and progressive muscular dystrophy. *N Eng J Med* 261:1089-1096, 1959.
7. Kilburn KH: The dimensional responses of bronchi in apneic dogs to airway pressure, gases and drugs. *J Appl Physiol* 15:229-234, 1960.
8. Kilburn KH and Sieker HO: Hemodynamic effect of continuous positive and negative pressure breathing in normal man. *Circ Res* 8:660-669, 1960.
9. Kilburn KH, MacDonald J and Piccinni FP: Effects of ventilatory pattern and body position on lung volume in dogs. *J Appl Physiol* 15:801-806, 1960.
10. Kilburn KH: Effect of adrenergic blockage with hydergine on hyperglycemia accompanying hypothermia in dogs. *Am J. Physiol* 199:955-958, 1960.
11. Kilburn KH and Schmidt AM: Intrathoracic Plasmacytoma. *Arch Intern Med* 106:862-869, 1960.
12. Kilburn KH, Miller HA, Burton JE and Rhodes R: Effects of altering ventilation on the steady-state diffusing capacity for carbon monoxide. *J Appl Physiol* 18:89-96, 1963.

13. Kilburn KH: Cardiorespiratory effects of large pneumothorax in conscious compared with anesthetized dogs. *J Appl Physiol* 18:279-283, 1963.
14. Kilburn KH: Tachypnea and hyperpnea: signs of compensatory ventilation. *Ann Intern Med* 62:486-498, 1965.
15. Kilburn KH: Neurologic manifestations of acute respiratory failure. *Arch Intern Med* 116:409-415, 1965.
16. Kilburn KH and Salzano JV: Respiratory cilia. *Science* 148:1618-1619, 1976.
17. Kilburn KH: Percutaneous arterial catheterization for blood sampling. *Am Rev Resp Dis* 92:293-294, 1965.
18. Kilburn KH: Muscular origin of elevated plasma potassium during exercise. *J Appl Physiol* 21:675-678, 1966.
19. Kilburn KH: Movements of potassium during acute respiratory acidosis and recovery. *J Appl Physiol* 21:679-684, 1966.
20. Kilburn KH and Salzona JV, eds: Symposium on structure, function and measurement of respiratory cilia. *Am Rev Respir Dis* 93:1-184, 1966.
21. Kilburn KH: Shock, seizures, and coma with alkalosis during mechanical ventilation. *Ann Intern Med* 65:977-984, 1966.
22. Kilburn KH: Cilia and mucus transport as determinants of the lung to air pollutants. In: *AMA Air Pollution Medical Research Conference, Los Angeles, California, March 2-4, 1966. Arch Environ Health* 14:77-91, 1967.
23. Kilburn KH: Principles of respiratory care. A statement by the committee on therapy, American Thoracic Society. *Am Rev Respir Dis* 95:327-337, 1967.
24. Kilburn KH: Pathogenesis and treatment of chronic bronchitis. *Med Times* 95:161-176, 1967.
25. Kilburn KH: Mucociliary clearance from bullfrog (*Rana Catesbiana*) lung. *J Appl Physiol* 23:804-810, 1967.
26. Kilburn KH: Clearance from alveoli to the ciliary escalator: implications for pulmonary diseases. 10th Aspen Conference in Research on Emphysema, Aspen, Colorado, June 6-10, 1967. *Current Research in Chronic Obstructive Lung Disease: Proceedings Tenth Aspen Emphysema Conference (PHS Publication No. 1787).*

27. Kilburn KH: Smoking. A statement by the committee on therapy, American Thoracic Society. Am Rev Respir Dis 96:613-622, 1967.
28. Kilburn KH: Theory and models for cellular injury and clearance failures in the lung. In: Symposium on the Development of Animal Model Systems for the Study of the Etiology of Emphysema and Other Chronic Obstructive Respiratory Diseases, La Jolla, California, October 6-7, 1967. Yale J Biol Med 40:339-351, 1968.
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33. Asmundsson T and Kilburn KH: Complications of acute respiratory failure. Ann Intern Med 70:487-495, 1969.
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41. Kilburn KH: Human costs of polluted air. Med Times 98:156-170, 1970.
42. Kilburn KH: Guest Editor, Prologue: Impressions of the workshop as communication. Arch Intern Med 126:415-416, 1970.
43. Kilburn KH and Rylander R: An interpretative summary of the Bermuda workshop. Arch Intern Med 126:508-511, 1970.
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59. Kilburn KH: Modes of alveolar response to insult. In: Environmental Factors in Respiratory Disease. Edited by Douglas H. Lee, New York, Academic Press, Chapter 4, 1972.
60. Kilburn KH and Dowell AR: Renal function in respiratory failure: effects of hypoxia, hyperoxia and hypercapnia. Condensed article published in ICU (Upjohn Company publication), 1972.
61. Kilburn KH: Environmental medicine. *Medical Tribune and Medical News*, Vol 13, No. 32, August 16, 1972, and No. 34, September 6, 1972.
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65. Asmundsson T and Kilburn KH: Mechanisms of respiratory tract clearance. In: Sputum: Fundamentals and Clinical Pathology. Edited by M. Dulfano. Springfield: Charles C. Thomas, Chapt 4, pp. 107-180, 1973.
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102. Northrup SC and Kilburn KH: Role of mycotoxins in human pulmonary disease. In: Handbook on Mycotoxins and Mycotoxicoses. Edited by L.G. Morehouse and T.D. Wyllie. New York: Marcel Dekker, Inc., pp. 91-108, 1978.
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Lloyd C. Smith 2

TABLE 1: NEUROBEHAVIORAL TESTS, FUNCTIONS MEASURED AND THEIR SOURCES. (1)

TEST	FUNCTION ASSESSED	SOURCE	DATE	REF.
Choice Reaction Time	Eye-hand coordination motor speed	Kilburn	1987	11,16
Balance	Proprioceptive, vestibular, cerebellar and visual control	Warshaw	1988	17
Story 1 & 2	Verbal memory	Wechsler memory scale	1945	18
Pictures	Visual memory	Wechsler memory scale	1945	18
Digits Forward and Backward	Verbal memory	Wechsler memory scale	1945	18
Block Design	Visual-spatial skills	Wechsler adult intelligence scale-revised	1971	19
Slotted Pegboard Trails A	Eye-hand coordination, psycho motor speed	Purdue	1963	20,21
Trails B	Mental flexibility attention, eye-hand coordination	Halstead- Reitan battery	1958	20,22
Finger Writing	Peripheral sensation, cerebral interpretation	Halstead- Reitan battery	1966	20,22
Embedded Figures	Cognition - sorting competing messages from background	Valciukas	1966	23
Culture Fair	Nonverbal intelligence, design recognition, reasoning	Cattell	1951	12,13
Profile of Mood States	Emotional status, self appraisal	McNair	1971	14,15

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TABLE 2
LLOYD SMITH (LS) COMPARED TO NEUROBEHAVIORAL TEST SCORES AND
CONFIDENCE INTERVALS (sd) FOR 14 CONTROL FIREMEN WITH SIGNIFICANT
DIFFERENCES

	14 Controls	95% Confidence	LS
	m sd	interval limits lower upper	
Age	34.9 ± 8.5	30.5 - 37.2	41
Years as fireman	14.1 ± 7.7		0
Education Level	11.2		12
Story 1 verbal memory	13.6 ± 2.8	12.7 - 15.0	10 +
Story 2 verbal memory	9.6 ± 4.1	8.0 - 10.9	8
Visual memory	11.7 ± 2.9	10.8 - 12.8	10 +
Digits forward	6.9 ± 1.4	6.5 - 7.6	7
Digits backward	5.1 ± 1.2	4.5 - 5.4	5
Block design score	31.9 ± 6.0	30.5 - 33.5	29 +
Pegboard dominant	70.4 ± 6.6	67.1 - 73.0	93 +
Pegboard non-dominant errors			78 + 0
Trails A	27.8 ± 6.5	24.3 - 29.6	36 +
Trails B	66.4 ± 17.3	58.6 - 71.3	90 +
errors	0.2		0
<u>Finger perception</u>			
error writing rt.	1.7 ± 1.5	0.9 - 2.3	8 +
error writing lft.	2.3 ± 1.9	1.1 - 1.6	2
Embedded Figures	31.4 ± 5.0	29.5 - 33.2	33
Culture Fair	63.4 ± 6.3	60.8 - 65.8	58 +
<u>Reaction times</u>			
Simple 1			290
2			290
3			315
Choice 1	574	543 - 604	680 +
2			1035
3			615
<u>BALANCE</u>			
eyes open 1	1.30 ± .33	1.16 - 1.43	1.40
2			1.54
eyes closed 1	1.55 ± .86	1.13 - 1.70	1.45
2			1.32
Digit Symbol			46
Information	19	14 - 26	25
Similarities	22	17 - 27	26
Picture completion	16	14.5 - 17.5	15

(3)

LLOYD SMITH (LS) COMPARED TO NEUROBEHAVIORAL TEST SCORES AND
CONFIDENCE INTERVALS (sd) FOR 14 CONTROL FIREMEN WITH SIGNIFICANT
DIFFERENCES

	14 Controls		95% Confidence interval limits		LS
	m	sd	lower	upper	
POMS 1 Tension	11.2	± 7.2	7.8	- 13.9	9
POMS 2 Anger	9.5	± 8.1	5.1	- 12.8	8
POMS 3 Depression	8.7	± 9.4	4.7	- 12.1	7
POMS 4 Vigor	19.1	± 3.1	16.2	- 19.6	12
POMS 5 Fatigue	5.9	± 3.3	5.7	- 10.3	1
POMS 6 Confusion	6.4	± 3.3	4.7	- 8.9	4
Total POMS score	22.6				17

+ Significantly impaired

21