MABEL RICHIE,
Plaintiff-Appellee,
vs
OWENS-CORNING FIBERGLAS CORP.,
Defendant-Appellant.

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DISTRICT COURT
BOULDER COUNTY
COLORADO

CASE NO. 88CV1821

REPORTER'S TRANSCRIPT

MABLE RICHIE,

Plaintiff,

v.

OWENS CORNING FIBERGLAS,

Defendant.

The trial in this matter commenced on Monday, November 16, 1992 through Friday, December 4, 1992 before the HONORABLE MORRIS W. SANDSTEAD, JR., Judge of the District Court, and a jury of six and two alternates.

The following contains the complete eighth day of the trial on November 30, 1992.

FOR THE PLAINTIFF: CONARD METCALF
and
MICHAEL PATRICK
1435 Arapahoe Avenue
Boulder, CO 80302

FOR THE DEFENDANT: HARMON GRAVES
and
MARK SPITALNIK
Suite 1001, Ptarmigan Place
3773 Cherry Creek North Drive
Denver, CO 80209

I N D E X

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P R O C E E D I N G S

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THE COURT: Are we ready for the jury, Mr. Metcalf?

MR. METCALF: Yes, Your Honor.

MR. GRAVES: Sure, Your Honor.

THE COURT: Mr. Graves, your next witness.

MR. GRAVES: Your Honor, I would like to call Dr. Russell Sherwin forward to be sworn.

DR. RUSSELL SHERWIN,

called as a witness on behalf of the Defendant, having been first duly sworn, was examined and testified as follows:

THE COURT: You may be seated. Please state your name and spell it.

THE WITNESS: Yes, Russell Sherwin.

DIRECT EXAMINATION

BY MR. GRAVES:

Q Good morning, Dr. Sherwin. What is your profession, sir?

A Physician, I guess.

Q Do you have a specialty?

A Yes, pathologist.

Q What does a pathologist do, sir?

A We look at -- I look at tissue. This means I have to a have a microscope that is a light microscope,

electron microscope with special stains. So if it's anything to do with biopsies or autopsy material, I look at it.

Q Doctor, I wonder if you'd tell the ladies and gentlemen of the jury something about your education. Take us through medical school and subsequently, if you would, please.

A Well very briefly, I undergraduated -- well, medical school?

Q That's fine. Start with --

A Dartmouth and Boston University, residency in pathology in New York. Well, actually I started in -- no, I did start in New York, that's right. No, I beg your pardon, absent-minded, Georgetown. My first year residency was at Georgetown, then to New York, then to -- well, I finished my training actually in the US Army. I went overseas and was part of a general hospital. They gave me credit for my last year, I believe.

Q From what medical school did you graduate, sir?

A Boston University.

Q In what year?

A 1948.

Q What did you take your residency in?

A Pathology.

Q And are you board certified?

A Yes, I am.

Q What does that mean?

A After you've completed your training; medical school, internship, residency, then you take an examination that if you pass the examination which is an oral and written for two or three days, I can't remember what, but if you take the exam and pass, then you're -- they'll certify you as a properly trained pathologist.

Q Are you licensed today practice your profession, sir?

A I'm sorry? I missed that.

Q Are you licensed to practice?

A Yes, I am.

Q In what states?

A Well, California of course. But I started out in New York and then Massachusetts, also New Hampshire.

Q What facility are you associated with at the present time, Dr. Sherwin?

A University of Southern California.

Q In what department?

A Department of pathology.

Q Dr. Sherwin, I wonder if you'd explain some of -- some of your academic appointments over the years either as an instructor, professor, and the like.

A Well, I did the usual training program climbing

the ladder. You start out as an assistant and go up to instructor, assistant professor, associate professor, and finally you become professor, or you hope to. And I did that in two places, well three actually. I started at Boston University, I had a joint appointment in Harvard Medical School, and then I came to the University of Southern California as an assistant professor and then I climbed the ranges to associate, then finally full professor.

Q And what teaching responsibilities did you actually undertake, what subjects, and to whom did you teach?

A Well, my basic field is pathology so my teaching was basically restricted to pathology. And I tended to focus on cancer and lung pathology.

Q Doctor, I'd like to focus for a moment on your professional administrative type appointments. Can you outline some of us those for us, please.

A Well, which ones would you like?

Q All right. Let me start with American Board of Pathology. Were you an examiner?

A At one time, yes.

Q What did that involve?

A Well, turning the tables around, you give exams.

Q What examinations?

A Well, people who were going to take their board examinations.

Q In pathology?

A In pathology, yes.

Q How about the California State Department of Health Services? What role do you play there?

A Well, there I am a -- unlike Boulder, we have a lot of smog. And in Los Angeles -- I guess Denver has a fair amount. And for that reason and my interest in lung disease I was put on the advisory committee for the state of California. It's now called the California Environmental Protection Agency. And I'm on their committee for air quality.

Q I want to explore some of your roles as a consultant, Dr. Sherwin, as well on a local level about -- how about the American Lung Association?

A Well, I have not been too active in those. I have been a member of the Cancer Society, Lung Association, I even made a movie for the American Cancer Society at one time. But the most important local one is what is called South Coast Air Quality Management District.

Q What does that do?

A That is in charge of regulating air quality throughout the whole south coast based in greater Los Angeles and other areas. And I'm the chairman of their

health advisory committee. There's a health science committee that has to do with evaluating the problems that have to do with the pollutants, regulation, and so forth. So I do serve as the chairman because it's part of what is called an advisory council. So I'm on a subject committee of the advisory council.

Q Let's step up for a moment. On the national level what involvement have you had with the World Health Organization?

A Well, way back in 1967 the World Health Organization founded a reference panel. It's called the United States Mesothelioma Reference Panel. And they had a concern at the time that the diagnosis of mesothelioma may be increasing because of changes in practice. In other words, the incidents may not be real. Doctors may be making the diagnoses without proper scientific foundation.

So this organization got together a group of panelists, specialists in the area, and I was one of them because of my interests in lung cancer I guess. And our specific job was to look at cancer diagnoses that were made by different pathologists, some of them were diagnoses they themselves questioned, could it be, and some were diagnoses that were made. And we were asked to give our opinion; in other words, would this panel agree that these were mesotheliomas.

Q And these were referred by other physicians?

A Yes. This -- throughout the country this was -- the central office was actually in New York and New Jersey. And members of the panel came from all over the country.

Q How long did you serve on this panel, Dr. Sherwin?

A 1967 to 1985.

Q Doctor, what involvement have you had with the National Cancer Institute?

A Sometime in the early 1980s, and I can't remember exactly, 1980 or '81, the same question came up in Los Angeles, the greater Los Angeles County. We were seeing more cases of mesothelioma than usual. There was just -- pathologists never seen a case of mesothelioma in the early days, never. So all of the sudden pathologists in general were seeing these cases and questioned are they real or not.

So the National Cancer Institute had a grant supported program of epidemiologists and pathologists, and -- actually one pathologist, me. And they wanted me to look at every single case in Los Angeles County for a seven-year period. There was actually well over 300 cases listed, probably more. So anybody who had the diagnosis of mesothelioma on the death certificate was put into this series to study.

Now, the diagnosis may have been a question mark. Pathologists may not have believed it was, but it was a question. But everyone of those became a study subject to be widdled down in terms of did we have enough material to work with, could we folow up, and so forth.

But in any event, I was assigned the job of asking as a pathologist who had been on the panel for the US reference panel what did I think, how many of these were really valid.

Q About how many such cases were presented to you for evaluation?

A Well, I think it got narrowed down to a little over 200. And then because of little things that -- the epidemiologists were not happy about the materials I couldn't get, I couldn't get the slides or I couldn't get the blocks, I think the eventual number was 164 or something like that, or 162, in that range.

Q And were you able to confirm the diagnosis of mesothelioma in any of those cases, Doctor?

A Yes, I accepted actually 29 percent. The paper read 26, but there was a group of tumors in there which were called benign mesotheliomas, and they should not have been included in the compilation. But it's 26 percent of the overall group of 29 percent of those which were of the cancers.

Q Did you find cancers that -- strike that. Did you make a diagnosis that favored cancers other than mesothelioma?

A Well, in other words, if we accepted 29 percent, then the cause of the rest of them had to fall in -- in the category where we didn't accept it. That category was twofold. There was two different categories. One said that I was confident it was some other kind of cancer as far as adenocarcinoma or something else. And the other one said well, I couldn't be absolutely sure it was carcinoma, but I thought it was. I favored it, which meant that I hadn't excluded mesothelioma. So there was some cases where I hadn't entirely excluded it, but I hadn't -- but I favored carcinoma.

Q Were the results of this study published, Dr. Sherwin?

A Yes.

Q Do you recall the publication?

A Well, it's in the CV. I think it's the British Journal of Medicine or something.

Q What year approximately?

A 1984.

Q Now, at this time in 1984, Dr. Sherwin, were you involved in any consulting for litigation with the respect to the subject of mesothelioma?

A No. This was all in the National Cancer Institute sponsored study. None of those cases to my knowledge ever came up for litigation subsequently.

Q Now, after this publication and completion of your study did you become involved as a consultant in litigation?

A Yes, I did.

Q Approximately what year, sir?

A Well, definitively I would say 1985.

Q Now, in this litigation setting, Dr. Sherwin, were you asked to analyze tissues and make a diagnosis if possible?

A Yes.

Q And were your services generally sought by plaintiffs or defendants side of the cases?

A Well, I was open to anybody. And initially we had three or four plaintiffs. But subsequent to that it's been entirely defendant.

Q Now, let's look over the past couple of years. Approximately how many cases are presented to you for an analysis as to whether or not it's a mesothelioma or some other form of cancer?

A Well, I've never kept a tally. One of the reasons is it's very hard to tell because some cases may be a year old. I think this case was a year ago or something.

But generally speaking, I wind up with around say 24 to 34 cases a year, in that range.

Q Would you state whether or not, Dr. Sherwin, you were able to reach a diagnosis of meso in some of these case and rejected it in others?

A Yes.

Q Now, let's review what you did. Let's take our last year, 1991. And should we speak of 24 to 34 cases?

A Well, that's an estimate. That's probably true.

Q All right.

A That is -- I don't know exact numbers, but it's in that range.

Q Now, when you give a diagnosis of mesothelioma; that is, make a positive finding to a defendant's lawyer such as myself, would you state whether or not you are generally asked to proceed further after that?

A No, I've never had -- I've never had any defendant ask me to write a report, go to trial, or give a deposition once I've indicated that this tumor may be mesothelioma.

Q Now, you've indicated that you may have testified in court. How many such appearances like this with respect to mesothelioma did you undertake in 1991?

A Two trials in 1991 and nine depositions.

Q Well, that would be 11 out of those some 24 to 34

cases?

A Yes.

Q Is that correct?

A Yes.

Q Would you state whether or not, Dr. Sherwin, the remainder included cases resolved without further proceedings and included cases that -- in which you gave a diagnosis of mesothelioma?

A Yes. I have -- I have such cases very definitely in mind that I can't recall the exact cases. But there definitely are cases that come up where I will say my estimate is that if the panel were to look at this you would probably get a majority if not unanimous opinion that this is a mesothelioma. Then after that the case is generally resolved some way.

Q Now Dr. Sherwin, on a prior occasion have you undertaken such an evaluation for me in another case?

A One, as far as I know.

Q And how long ago was that, sir?

A Last year maybe. I'm not sure.

Q Close enough.

All right. Let's go back to pick up some loose ends in your professional career if we may. Were you associated with the University Hospital in Boston?

A Yes. I was actually the acting chief of

laboratory when I left to come to Los Angeles.

Q What does that position entail, or did it entail?

A The laboratory had three main functions. One was surgical diagnosis; in other words, biopsies, suspected lump in the breasts. Doctor would biopsy it, it would come to our department, we'd make a diagnosis. Then there was an autopsy service which was again a part of the department's responsibility. And then the third part of the responsibility was teaching. We had medical students for teaching, and we had surgeons who were coming through for training in pathology. We had internships and residencies in pathology. So we ran a teaching program to train not only pathologists, but surgeons and clinicians.

Q Doctor, let me focus for a moment on your publications. Have you published any articles with respect to the subject of cancer and mesothelioma in peer reviewed journals?

A Yes, I have.

Q And what does the peer review process mean generally?

A Well, peer review simply means that when you write something other people look at it who have background in pathology and know something about that particular area. So the implication is that what you're saying is scientifically sound to their best capability. And if they

believe so -- it may differ from their opinion. But if they believe that it has merit then it's accepted for publication.

Q Now Doctor, approximately how many peer reviewed articles have you written on the subject of malignant and non-malignant lung disease?

A Gee, I've never really tabulated. But most of my articles are on lung disease, most of them. And there are some 100 something articles in peer review journals, leaving out chapters in books and none peer review.

Q Let me ask you this, Doctor, have you addressed the issue of lung cancer generally?

A Well, lung cancer has been my special interest. I started my research career in lung cancer and basically have continued to this day. Mesothelioma is really not much of a different direction for me except that of all the cancers I've been concerned about, mesothelioma has been one of the most challenging and has somehow become very frequent in terms of the problem. But the problem I was involved in was how do you tell the difference between a cancer that arises in the lung and spreads through the lung, metastases primary versus secondary. And I spent most of my research career or a great part of it in the early days on this very subject, how do you do that.

Q Have you published on the subject of metastasis;

that is, spreading of cancer?

A Yes. We were very, very concerned not only in terms of the human experience, but in terms of the mechanism; in other words, actual mechanisms may even involve why certain organs are selected, the blood vessel alterations, and that type of thing.

Q Have you also addressed the subject of mesothelioma in your published articles?

A Yes.

Q How about the subject of breast cancer?

A Well as a matter of fact, I have done research in breast cancer. And that was supported by the National Cancer Institute. In fact, I had a strong interest in that at one time, so much so that I was on what was called the National Task Force for Breast Cancer.

The National Cancer Institute has a mandate that let's do something about improving diagnosis, getting at the etiology causes, and actually had a task force. And I was appointed, and my job was to read grant applications and help further research in this area. I gave money. I didn't get money as a result. Well, I did get one grant support independently of this of course.

Q How about articles in preparation, Dr. Sherwin? Are some in preparation at this point?

A Yes.

Q On what subject, sir?

A Well, mostly in two areas; the area I'm working on which is air pollution, and another area which is cancer, which largely now is mesothelioma.

Q How about presentations? Have you presented papers and lectures to your --

A Yes, I have a number of -- fairly long list of presentations.

Q Have these addressed malignant and non-malignant disease?

A Both, yes.

Q Metastasis?

A Yes.

Q Mesothelioma?

A Yes.

Q Have you also contributed to books; that is, professional text books and the like?

A Yes, I have.

Q In what general field, sir?

A Well, mostly lung cancer. I think there was a chapter on metastasis and -- well, basically those three areas; cancer, my air pollution area, metastasis, that type of thing.

Q Doctor, I'm going hand you Exhibit 457G and ask you if you can identify this.

MR. GRAVES: May I approach the witness, Your Honor?

THE COURT: You may.

THE WITNESS: Yes, that's a curriculum vitae which is a listing of my background and publications, memberships and so forth, like a resume.

Q (By Mr. Graves) What's the date of it, sir?

A July 1, 1992.

MR. GRAVES: I request admission of Exhibit 457G.

MR. METCALF: I'll object on the basis of redundancy. I think we've had a pretty good outline of what's in it already.

THE COURT: It's admitted.

Q (By Mr. Graves) Dr. Sherwin, we've had other physicians testify before this jury, and I think we have a pretty good working knowledge of mesothelioma and the cancer process. But there are a few things I want to focus on here this morning and perhaps narrow your testimony if we can.

First of all, what makes the diagnosis of mesothelioma difficult, if it is?

A The -- I think the first thing that makes it difficult is we don't have a gold standard. There's no single criterion or for that matter combination that says this is a mesothelioma and nothing else can look like it.

So unfortunately at the time we're standing right now the diagnosis is largely an exclusion. Things have to be negative with a few -- with a few findings that tend to favor mesothelioma, but they're not absolute.

So if you don't have something that says this is a man, this is a woman, and it's a real gold standard, and sometimes that's a problem, then of course it becomes a real difficult problem. And this diagnosis of mesothelioma is the worst that there is in terms of yard sticks or gold standards now. That's one of the major reasons.

Another reason of course is that while one of the nice things about getting to be recognized as an expert in the field is I can say I don't know, but many cancers surprisingly can't be identified. And there's a tendency to want to put a label on it somewhere between 3 and 15 percent of the cancers are cancers of unknown origin. You don't know where they're coming from, but you find it in lymph nodes, there are metastases to skin or liver or someplace. And surprisingly some of these people will live many years. I can think of some report of 212 months of survival,, and they didn't still know where the cancer was coming from.

So if you have up to 15 percent, and I think the figure is higher because since pathologists will tend to say they know when they don't really have proof. There

will be an over statement of the positives, or the other way around, understatement of how uncertain you can be.

So that makes it a problem because if you don't know where the cancer is coming from, there's a tendency for cancers to be identified as mesothelioma. And this opens the door to criteria that may not be valid. In other words, I had a mesothelioma that made mucin, but really it isn't true because it just simply -- you never found the original site. So that's one of the things that's been a handicap; that criteria have come in that are not really valid. Those are basically the points.

Q What about the available information with respect to -- that might be made available to you? Is that a problem in diagnosis?

A Yes. Well, that's -- that's another important factor. And that is, you can make a diagnosis on nothing more than what we call a cell smear. You can cough up some material. You can take a needle and take some fluid out, make a smear. And that's called a cytology procedure, cytologic examination.

Well, that is -- that gives you very, very little information because all you're dealing with is a cell out of context. You don't have the structure. But you can do a biopsy. Could be very small piece or it could be a large resected piece or it could be a whole resected lung. Of

course the real high level of confidence comes from autopsy when you get a diagnosis of mesothelioma or whatever you've heard about and they include all of these. There are some made by nothing more than smears and cell blocks, and some made by needle asprays(phonetic). But if you don't have one made by autopsy which is -- obviously you have to make the diagnosis during living. But the high level of confidence cannot be reached until you've excluded the possibilities.

Q Doctor, why is the tumor called a mesothelioma?

A The lung is -- believe it or not, the lung is really outside of the chest cavity just as the bowel is outside of the abdominal cavity.

How can you say that? The answer is that the chest cavity has a balloon in it. And the lung grows into this balloon. If you can imagine that balloon being a transparent balloon, you can see the lung through the outside, but you see it through two different layers.

The layer of the balloon that covers the lung is the layer of the balloon that is at the top. Well, the top layer of the balloon is called the parietal pleura, and the bottom layer is called the visceropleura. And that layer is called mesothelium, and tumors of that layer are called mesothelioma.

Q As the tumor develops what do you expect to see

if it's a mesothelioma?

A Well, pathlolgists for years have always said if it looks like a mesothelioma, it looks like a lung cancer. There are many different kinds of cells in the lung. But the mesothelium has these two cell layers. And so what you're looking for is a proliferation of these cells. And they proliferate in two -- in two fashions. One is they proliferate and they still look like the layer.

Now, the layer is comprised of these two cell kinds. If you think of a rug, the rug would be a thin rug, not a pile rug. Then the rug would be the epithelium like the mesothelial lining. But underneath the rug has some sort of backing. I don't know what that's called, maybe somebody here can tell me. But the rugs usually have some kind of lining or floor backing. And those two things may grow together. If they grow together, then you have the interesting phenomenon of a tumor growing from two separate distinct elements; from the rug itself and from the back itself. And that's where that word biphasic comes in. So it's tumor that grows with both of those components proliferating.

Q All right. Now, if the tissue begins to look less like a mesothelial lining, what does that tell a pathologist?

A Well, then it becomes a problem obviously if --

if you want to make the diagnosis. What you're saying is if it looks likes the pleura then it becomes a yardstick. You can say well, I think it's mesothelioma because it looks like it now. It's one of many criteria.

What you do is you set up criteria which are established, and you go through the criteria and you say well, does it look like a mesothelioma. That happens to be two of the criteria. One of them says does it have the structure. The other one says did it have the components.

In other words, with bricks you can make a wall or chimney or a house out of the bricks, but the bricks that you use would be recognized well, this is a brick house, and it's red brick. And you say yes, it's made out of red brick. That tells you yes, it's a house because it has that shape. So you say this is a brick house because it's got bricks and it looks like a house. So that becomes your yardstick.

If you have that, if it looks like a mesothelial layer, that becomes useful as a diagnostic criterion.

Q Does this tumor come in different types, Dr. Sherwin?

A Yes. It's important for to you know that you can get three different kinds of mesothelioma. One is called diffuse malignant mesothelioma. That has an asbestos exposure relationship. There are two others. They're both

local. There's a localized form that just grows as a carcinoma would, local. And that is usually benign, but it also in 20 percent of the cases is malignant. And that can grow just like a carcinoma and invade the whole chest cavity and mimic a malignant diffuse mesothelioma. But the important thing is no one has ever shown the relationship between malignant local mesothelioma and asbestos exposure. So those distinctions become important.

Q All right. Dr. Sherwin, let's go directly to Curtis Richie if we may. At my request, Dr. Sherwin -- first of all, have you reviewed medical records pertaining to Mr. Richie?

A Yes, I have.

Q Have you reviewed pathological materials prepared by Mercy Medical Center in Denver?

A Yes, I have.

Q And how about pathological materials from Dr. Abraham?

A Yes.

Q Have you reviewed Dr. Hammar's reports of these cases?

A Yes, I have.

Q And how about reports from Dr. Abraham?

A Yes.

Q Did you also review a report from Bruce Case?

A Yes, I have.

Q Did you have the opportunity to review electron microscopy photographs?

A Yes. They were -- they provided me with some electron micrographs. And at the very tail end of this, even at the time of deposition, we were processing our own electron micrographs.

Q All right. Doctor, did you also have the benefit of immunohistochemistry reports from anybody in this case?

A That's correct.

Q And from whom did you obtain those, sir?

A Well, the laboratory is the USC immunohistochemical laboratory, and the director of that lab is doctor Clive Taylor, and one of his associates is Dr. Nancy Barr. And his associate, Dr. Nancy Barr, provided me with reports. Dr. Taylor read one slide and provided me with a report on one slide.

Q Now, is this department, Dr. Sherwin, under your direction and control?

A No. I have no tie to this department whatsoever in any way.

Q Did you receive any financial benefit as a consequence of a referral to this laboratory?

A No. It's a referral laboratory strictly and the counsel pays for the services.

Q And have you had a past working relationship with this laboratory, most specificially with Dr. Taylor and Dr. Barr?

A Yes. We have worked out the panel of tests with Dr. Taylor basically.

Q What has he done? What procedure did he go through?

A Well, Dr. Taylor has a formal listing. He has a check sheet if you want to have these tests. It's like in a lab if you have a blood count done, he has a check sheet and he has a listing of all the tests that he does in that laboratory. And he and I have over the years lined up those tests that we believe may be useful in the arrival at a diagnosis of diffuse malignant mesothelioma.

Q Now, what is your understanding of the reputation of that laboratory and personnel that are involved, most specifically Dr. Taylor and Dr. Barr?

A Well, I believe it's highly respected. Dr. Taylor has written a book on the subject which I believe is widely used. You know, I don't have -- I have several people that have asked about it. But I know their cases come in from all over California. Simply by overhearing comments I believe that it is highly respected.

Q What about the qualifications of the two individuals? Are they certified in their field?

A Yes. As well they're both -- they're both highly qualified in the area of immunohistochemistry. They're both board certified in anatomic pathology.

Q Why is it, sir, that you don't do your own immunohistochemical analyses specifically?

A The laboratory is very demanding. You have to be in total control of the antibodies you're buying. You have to control the tests. You have to train your technicians. There are control tests going on all the time, not just for the mesotheliomas that come there, but for all kinds of different cancers. And they all serve to tell them how well they're tests are going. You have to be an expert in the area to control all of these factors, know which companies are providing the best antibodies, and to know whether the antibodies they are providing you really are working. Since that would be a full-time job for me, I don't do that.

Q Doctor, who made the arrangements with the University of California laboratory?

A Well, we have this check list and we routinely check off a certain number. I think it's 23 routinely, somewhere in that range. And I have an associate who just routinely checks off these. Once in a while we will ask for something special if it's available. If we hear of something new coming up that the laboratory has not

particularly developed -- for example, the renal antibody was actually developed by somebody on our faculty, and my -- I knew he had that antibody. And Dr. Taylor made it available to us by asking him for it. He manufactured his own. In other words, he developed that in his own laboratory.

So the arrangement is basically mostly what is a formal listing that Dr. Taylor and I have arranged. He and I agree these are the ones who -- if we drop some of them because he will tell me we no longer do them or we substituted something or we've added something and we are now doing such and such a test, you may wish to include it, so we do. But that's the arrangement.

Q Doctor, did my firm or did I have any involvement in the making arrangments with Dr. Taylor?

A No.

Q To whom did the reports from Dr. Taylor's laboratory come?

A Well, the report came from doctor -- as I mentioned, doctor -- from Dr. Barr and one report came from Dr. Taylor.

Q To whom?

A To me.

Q Not to me?

A No. They're always addressed to me. They do it

as a consultation service for me.

Q Now Dr. Sherwin, did you also review a copy of a deposition of Dr. Barr taken by plaintiff's counsel in this case?

A Yes, I did.

Q When did you have the opportunity to review that, sir?

A Last night.

Q Now Doctor, would you state whether or not the immunohistochemistry analysis by a qualified laboratory is the type of information upon which pathologists rely in considering reaching a cancer diagnosis?

A Yes. Immunohistochemistry is a developing experimental methodology. It's still useful. But at the end of all the reports there's usually a disclaimer saying this is an experimental or developmental test. And therefore, it always carries a little bit of reservation that things are developing, -- you know, in mesothelioma, because there's a new antibody coming out almost like a book of the -- book of the month club. Not quite that but they certainly are frequent. I think basically that's that answer unless I left something out.

Q No, I think not, Doctor.

Let me, Doctor, go directly to the heart of the issue if we may. Do you have an opinion, Dr. Sherwin, to a

reasonable degree of medical probability as an expert pathologist and based upon your evaluation of all the materials that we have discussed this morning, have you been able to reach a diagnosis to a reasonable degree of medical probability?

A Yes, I have.

Q And what is that diagnosis, sir?

A My diagnosis is I don't really know. It's a tumor of uncertain origin. I'm not sure where it's coming from.

Q Doctor, we spoke earlier of the three types of mesothelioma. I think you listed those for us as diffuse, local non-malignant and local malignant. Do you have an opinion to a reasonable degree of medical probability whether this tumor in the pleura was one of such?

A Yes. I am confident this is not a mesothelioma. Whether we are talking about diffuse or local benign or local malignant, this is not a mesothelioma.

Q Dr. Sherwin, over the years have you developed, incorporated, adopted, whatever verb is most appropriate, certain diagnostic criteria that you feel are useful?

A Well, I have used them. When I joined the panel there was certain criteria that were told to me and that I learned from the experience of others, and of course that I've picked up on my own from the standpoint if they said

it looks like the cells of the mesothelium I got to look at the cells of the mesothelium. They were cuboidal to flattened, just the way they said they were. So some of these they told me most of them were confirmed. But they are -- they are established recognized criterion.

Q By whom?

A And I use them.

Q By whom?

A Well, they were used by the panel in most reports. I'm sure whoever has told you about mesothelioma from a pathology standpoint has mentioned the key words, so I don't think it's going to be any surprise in terms of the criteria I use.

Q Can you state whether or not these criteria that you just described are generally recognized in the field?

A Yes.

Q Now, as knowledge developed, Dr. Sherwin, particularly your knowledge and knowledge in published literature, for example, can you state whether or not you have adjusted you criteria or changed the focus over the years?

A Well, there are two things I did change when -- way back in the early '80s when electron microscopy was just starting out in the field basically. It was hopeful that microvilli might be useful. Turned out as I started

to do more and more that I didn't think it was useful. And I think this is a good concensus right now that microvilli are not very helpful. I don't consider them helpful at all, so I have discarded the use of microvilli.

At one time we used to use a test for what is called hyaluronic acid. The mucous in your mouth is neutral and the mucous in some of the other tissue is acid. And there was a thought at one time that mesothelioma made acid mucous and that might be helpful. Now these -- through these special tests and having done it I suddenly over the time realized it was scientifically very invalid, similarly had no scientific validity. I certainly don't even bother doing it.

So those are two things that have changed. And incidentally, those are what we call ancillary tests. They're part of the ancillary. They're not the body of the criterion.

Q Doctor, we've heard the term microvilli in this courtroom before. Just describe briefly what that refers to.

A Every cell has a membrane, has a cover to it. That's the whole life is enclosing all the things that you use to live with inside a membrane protected from the outside. Some cells not only have a membrane, but they have the property of making that membrane fold so they

become fingers like that. It's a very interesting property which probably carries over into malignancy, which we wish it wouldn't do.

When these membranes fold they form these fingers. Now, these fingers are very useful for some cells. Why? Because if you wanted to absorb water or absorb anything, the more area you have the better you can absorb it. So these little fingers on certain cells are called microvilli, and that's all it is. A lot of cells have those kinds of fingers.

Q As a consequence of your review of the electron micrographs in this case did you find bushylike microvilli?

A No.

Q Is that a distinct criterion that some physicians employ?

A Well, as I say, it was used. Some people still use it. I don't use it. But in any event, they weren't there.

Q Do some physicians commonly look for those in the presence of mesothelioma?

A Well, yes. What I'm saying is -- is that in trying to come to a diagnosis they use electron microscopy to look for microvilli, long sinuous meaning wavey microvilli. Bushy is another word that's used. Branching is another word that's used. I just don't believe we have

scientific background to make that a valid diagnostic yardstick.

Q But in any event, were they there or not?

A As far as I know no one else saw them either.

Q Now Doctor, have you broken down your criteria that you use in diagnosis of mesothelioma into two categories?

A Two categories?

Q Major categories?

A Well, there is the main body, and I mentioned ancillary.

Q All right. What do we call those?

A The ancillary ones?

Q Well, no. Let's start with the --

A The main body ones are what pathologists are always relying upon. Remember that when mesothelioma was first detected and in the early days of making a diagnosis before we had electron microscopy before we had the immunohistochemistry, before we even had histochemistry, we were relying upon certain solid anatomical findings on the gross level being what the naked eye could see, what the microscope showed you. And those are the main bodies of the diagnostic criteria.

Q All right.

A It's the main body of it.

Q Now, you threw me for a loop because you used a different word.

I'm going to show you, Dr. Sherwin, Exhibit 475. Can you identify that, sir?

A Yes.

Q What is that?

A Well, it's a chart that I had mentioned should be set up because it would clarify the diagnosis.

Q Does that reflect your findings?

A Yes.

Q All right. And instead of I think main body, have you referred to certain tests as primary?

A Well, that's interesting. I may have said that, but I don't ordinarily use primary.

Q All right.

A But main body is fine, or the main tests as opposed to ancillary tests.

Q All right. We've used primaries and others. Is that satisfactory?

A That's -- maybe that's a good term.

Q I'm going to display this to the jury. And Dr. Sherwin, I want you to take us through your findings if you would with respect to Mr. Richie's tissue. Let's talk about how the chart is structured. First of all, you're trying to make a differential diagnosis between

mesothelioma and cancer; is that correct?

A Yes. Your problem is relatively simple. All you're trying to say is you've got to decide between a man and a woman, and you've got certain criterion that says well that favors a man, that favors a woman. We're not looking for absolutes. In fact our panel never said absolute, it always confident, you're confident that this is a mesothelioma or you're confident it's not.

All we did was to take them all, we never took any one by itself. I never do no more than your doctor would take any test all by itself, history, and physical and all the tests. And he may ignore some of the tests and say well, it doesn't fit. So you have to do what is called a clinical pathologic correlation, put all the pieces together. But while you're doing it you set up this little arrow, and it says which way is the arrow pointing. Is it pointing towards carcinoma? Is it pointing towards mesothelioma? And that's what this is doing for you.

Q All right. Well, in the interest of saving space on a chart like this, we've simply used yes or no. Do you intend that to be a definite yes or no?

A Well, I usually use plus or minus, but I guess you're tired of plus and minus and it became yes and no.

May I get up and look at this?

Q Yes, of course.

A So yes simply says the arrow was pointing this way, and no says the arrow was pointing this way.

Q That's all?

A The other -- the other way around if it says no it means the arrow is pointing to something else.

Q So we have a category for mesothelioma, adenocarcinoma, and Mr. Richie. Is that the basic structure of the chart?

A Yes.

Q Let's jump right into what you have denominated five primary testings and discuss the first one, diffuse lung encasement. Tell us what's involved and what you found.

A Yes. We -- remember we said that the name of this cancer is diffuse malignant mesothelioma. So right off there is a criterion everybody knows and can recognize. It didn't say local, it says diffuse. You have to ask yourself what is diffuse.

One of the problems is that people don't define their criteria. This is -- I guess my lectures usually say you must uniformly define and uniformly apply criteria, and that's why you're in trouble.

So what is dif -- what does diffuse mean? Well, diffuse is like a pillowcase. It covers your pillow, and so that's a pillowcase. You can take a dozen hankerchiefs

and do it, but it's not a pillowcase. That's what carcinoma does. So you have to have a definition. My definition comes out of Webster's Third International Dictionary which is, I think, a 1981. What it comes down to is diffuse means completely covered. Now, when this was originally defined Dr. McCoy had written down the outstanding characteristic is the completeness with which it invests the lung. And that's what I require by diffuse, it has to be a rind.

A rind is like an orange rind, grapefruit rind. It is around the lung. It's the most characteristic, most distinctive thing you see.

So we asked ourselves this question, does this fulfill the criterion of -- of being a rind of cancer that encases the lung. And the answer is it should be if it's going to be a diffuse mesothelioma. But it does not. In adenocarcinoma ordinarily. And Mr. Richie definitely did not have -- no one described a rind of cancer encasing the lung, definitely didn't describe that.

Q Doctor, did you have the opportunity to take some photographs through the microscope?

A Yes, I did.

Q And is there some photographs that help us to try to define whether or not we have a rind tissue or some other --

A Yes, I made two 8 by 10 color pictures for you to look at.

Q I wonder if you would direct your attention, please, to exhibit 470 and describe that for us. First of all, ask you can you simply state what it is, how it was prepared, and we'll go from there.

A Yes. Is that Exhibit No. OCF 470?

Q Yes, sir.

A This is from the left lower lung, left lower lobe of the lung. And from where you are you can see just two things --

Q Excuse me, Doctor. Just for our court procedure here it's easier if you can tell us where that was obtained, who obtained it, and then we'll go --

A Yes. It's a biopsy from the left lower lobe of the lung. And it was a February, '87 operation. I can't remember exactly the date, but it's an operation in which they explored the chest cavity and found what they suspected might be cancer, I assume, and they biopsied it.

Q Whose tissue is it, sir?

A This is Mr. Richie's. This is from the lung of Mr. Richie at the time of that operation.

Q Does that reflect what is visible through the microscope?

A Yes. In other words, the biopsy was taken,

processed through the laboratory, sections stained, and then I took -- I took a look at it and this is what I saw under relatively low power.

MR. GRAVES: All right. I request the admission of Exhibit 470.

MR. METCALF: No objection.

THE COURT: It's admitted.

Q (By Mr. Graves) Doctor, would you explain to the jury what is depicted there.

A You can basically see two things. One is a rounded, oval sort of structure on the top very, very well defined, and then some lacey material on the bottom. So the top half is this rounded overmass almost like an avacado, I suppose. Then on the bottom is a lacey structure, that's lung. So the lower half is lung tissue. And then when you look at it more closely you will see a line that goes across between this mass and the lung that's the pleural surface.

But the important thing for you is this has the characteristics of carcinoma. What is the characteristics? A rind of cancer would be the entire lung is surrounded by this kind of material everywhere. You could not find pleura anywhere without this material. Conversely, if it's lung cancer two things usually happen. You get a nodule that metastasizes to the pleura, spreads by channels, or

cancer cells drop off of another site in the chest cavity and they're just like seeds of grass. They implant. It's called implantation. Now, I don't know whether this is a metastasis to the pleura or an implantation. I believe that more likely is an implant. In other words, the cancer cells fell off, stuck to the pleura, and they grew like this. If it were a vegetable of some sort it might be I suppose a cauliflower or something on top of the pleura. But the important lesson is around the lung is pleura without tumor.

So this is the classic typical picture of what carcinoma of the lung or any other cancer would do when it was metastatic from an abdominal organ or any other place, that's what it does.

The pluera is a common site to spread. And once any tumor gets into the lung it's going to get in the chest cavity and it's going to have the opportunity to see and do this.

Q Doctor, would you state whether or not this photo represents encasement or diffuse?

A No. Very specifically we said if there were encasement there would be no pleura free of this particular tumor.

Q All right.

A You would not see -- the hallmark of carcinoma is

nodules. The hallmark of mesothelioma is a rind and encasement, multiple nodules, a rind like a grapefruit rind that's everywhere is mesothelioma. That's a standard definition.

Q Doctor directing your attention to Exhibit 471, was that obtained by you, sir?

A It's a picture I took.

Q Does that reflect what you saw through the microscope?

A Yes.

Q Is that Mr. Richie's tissue?

A This is Mr. Richie's tissue. It's that lung biopsy that was taken from that operation, it's the same tissue.

MR. GRAVES: I request admission of Exhibit 471.

THE COURT: It's admitted.

Q (By Mr. Graves) Would you then describe to the ladies and gentlemen of the jury what you find there, sir?

A This piece of tissue comes from the same microscopic slide that that came from. That is incomplete. I don't show a lower power that brings everything in, but this gives you a higher power of the pleura so everything at the top of this field that runs from here to there is pink material.

I can't -- there's no cancer there. This is a

thickened pleura which is called fibrosis. So it's fibrosis of the pleura from what cause I don't know.

Anytime you get anything wrong with the chest you have to be concerned that you're going to get fibrosis. You can have an operation you can go do a chest tap and get fibrosis. Automobile accidents may have contributed to this. But the cancer growing there itself is an irritant. And you get bloody fluid. And bloody fluid means the pleura reacts. And you will get this thickening.

But the important thing is this is fibrous thickening of the pleura and not a cancerous thickening. By definition diffuse malignant mesothelioma must be a cancerous rind that is diffuse and encases the lung. That's the definition.

Q All right, Doctor. Let's go to the second primary test that you have depicted up here. And that's a biphasic characteristic or -- I wonder if you'd explain what that is, please.

A One of the reasons diffuse malignant mesothelioma came into existence was simply because it had these two kinds of -- may I take that piece of paper and show them?

Q That's a good idea. Thank you.

A It will be handy. If you think about the yellow as the mesothelial epithelial layer and the blue as the supporting connective tissue, this is what covers the lung.

The lung is covered with this particular lining. Now, it has epithelial lining and it has the connective tissue lining.

How often do you get a cancer that proliferates with both of these? Not common at all, very unusual. So when you get a cancer that does both of these and it looks like the mesothelial lining, it becomes a sign that says if it's biphasic it has diagnostic value. Biphasic I suspect is not the commonist form, but if it's only the epithelial, that's what you see with carcinomas. So it doesn't have any value, doesn't have diagnostic value if it's epithelial only.

So even though somebody may say well, it's frequent, if you talk about confidence level you have a higher confidence level when you have both of them because that was how this entity was born. It was both of these growing together. So biphasic -- nothing complicated. It says isn't that extraordinary to have a tumor that comes from two different cells.

What do you mean by that? Well, it's just like having a carcinoma and a sarcoma at the same time. We don't usually -- pathologist says it's carcinoma or say it's sarcoma and says no, no, this one is both, meaning, Doctor, I have a cancer of both tissues. Yes, that's one of the unique things as a diagnostic value for diffuse

malignant mesothelioma, it does both. And that's what biphasic meanings.

Now, diffuse malignant mesothelioma if it is biphasic I say it favors the diagnosis. If it isn't biphasic then it says -- the arrow says well, I expect this proliferation to be with carcinoma. So therefore, it would deny it with adenocarcinoma. And Mr. Richie had an epithelial carcinoma only, he did not have a biphasic cancer.

Q All right, Doctor. Let's go to the structure now of our cells. I think you referred to tubulopapillary. What does that mean?

A Let's look at three and four together because they will tell you about them separately, but they go together. Tubulopapillary says that its architecture -- if it looks like -- all we're saying is this was one of the real hopes in the early days that that's how if you had a cancer that looked like mesothelioma and it was diffuse and it was biphasic and we had this uniform, flattened, cuboidal. And we did an autopsy there wasn't any, that was ideal. And then you would say I am confident this is mesothelioma.

So then somebody says tell me what it looks like. Well, mesothelium you said has a double label and has flat, cuboidal cells that constitutes this layer. But one of the

structural things it does is it folds. Why does it fold? Well, if you had a rug and it was too big for your room you're going to have to cut off the end. Otherwise you're going to get folds in the rugs. If you had too many cells growing, which is what happens with cancer, you get folds.

And so one of the things that happens is -- is that this layer as it proliferates starts to fold gets to look a lot like Christmas candy kind of thing. And if you make a section through this you're going to see more circles than you're going to see anything else.

But let me show you how that fold really looks. If you take the first fold -- if I take that first fold and look at it you'd see that little finger. And if you look inside that finger you find connective tissue, and you will see that tubulopapillary structure. In fact, there's a picture in that text.

Now, where did the tubules come from? The answer is cancers don't always proliferate even steven. So wouldn't it be great if they -- all the folds were uniform. They aren't. What happens is that some of the lining connective tissue on the surface will proliferate on its own and will start to curl. When these curl then you make a section through them. It's called tubule. So this kind of proliferation has a tubule look which is like a doughnut.

As these cells -- as the epithelium proliferates and forms this and it has this papillary thing when it forms the finger we get the core of connective tissue which you must have to make a true diagnosis of tubulopapillary. True papillary has that core. Now, if you have that then you can say well yes, it looks like mesothelium.

Then you have to -- may I go to the uniform flattened cells. The usual mesothelial cell is like a sugar cube. And incidentally we call them cookie cutting cells. Cookie cutting meaning that you stamp out one and they all look the same.

When the lung is covered by a cuboidal cell then you take a deep breath, it stretches it. So when it stretches it, it becomes flattened. So we talk about cuboidal and flattened cuboidal. They're just stretched. So that's all it means. And that's as it looks like a mesothelial cell as does it looks -- well it looks cuboidal, well it looks flattened because it may be stretched out.

So I say yes, I'll accept that uniform cuboidal flattened cell uniformity as one of the marks of diffuse mesothelioma. It's one of the outstanding characteristics. It's also in a bland cell. They all look alike. They don't look particularly harmful.

Now, the opposite of this uniformity is something

that says you wouldn't want to make a tie. Well, I shouldn't say tie because -- well, if you had wallpaper, I wouldn't want the wallpaper to be a nightmare of different sizes and shapes. So if you have a tremendous variation of size, shape, and at the same time you have the antithesis of this. So what it says the more you deviate from uniform cuboidal the less confident you're going to be in your diagnosis.

Now, in this case we have one of the photographs --

Q Doctor, I'd like you hand you exhibit 472. Did you take that photo, sir?

A Yes.

Q Does that reflect what you saw through the microscope?

A Yes. This is cancer again from that biopsy of the same operation.

Q Of Mr. Richie's tissue?

A Yes.

MR. GRAVES: I request admission of Exhibit 472.

MR. METCALF: No objection.

THE COURT: It's admitted.

Q (By Mr. Graves) Would you please tell the ladies and gentlemen of the jury what that represents, Doctor.

A One thing about cancer is it varies. You may get

an area that's very uniform, then it varies. You have to pay attention to that variation because sometimes variation is trying to tell you something. It's trying to differentiate or become something else.

Well, what I want you to see out of this is that you're not going to see uniformity. You're going to see polygons, you're going to see kite shape structures, banana shaped structures. This almost looks like a banana, pear shape structures. And they are dark, they vary in size, they vary in shape, they vary in staining. This is what we call pleomorphic. It's the antithesis of what you should get for uniform cells. This kind of thing says well, this is what you expect to see in carcinomas, you don't expect to see in mesothelioma.

Q All right, Doctor. Let's go to your last of the primary tests and tell us what the primary site identification means and what significance it carries with Mr. Richie.

A Yes. If you have any amount of experience in the pathology of mesothelioma you get the experience where you found the cancer in biopsy or resection of the chest or someplace else, and you're confident on the basis of the surgical material that it's mesothelioma.

And then low and behold at autopsy somebody finds a small occult cancer that clearly indicates this cancer

came from that particular organ. You can see the whole transition, you can see coming from the glands, going in the different shapes. And then all of the sudden you realize as confident as you were, you were fooled.

And this is the occult cancer. This is your uncertain origin. That may be 15 percent. And I say that's probably conservative. And because of that an autopsy is an exclusionary principle today and is very important. One, it says that yes, you can make the diagnosis during life, but you're not going to have the highest level of confidence, especially if a question is raised about cancer being someplace else.

So this exclusionary principle is a very critical one. And what it says is there is no site outside of the pleura. That's true -- well, for mesothelioma that's true. With adenocarcinoma it's not. I didn't say multiple sites, but it should say multiple organs. Any number of organs and tissues may give rise to cancer. And your job is to find the primary site would be in one organ or another; the pancreas, the thyroid, kidney, the lung.

And in Mr. Richie's case I strongly suspect the lung. I have reason to believe that -- maybe the kidney. But there's no autopsy, so I am faced with the fact that scientifically I can say to you the findings suggest the lung, the finding -- maybe the kidney.

But that's why you do autopsies, which of course would be information you can then use later on once we develop these tests. So it's important to have the autopsy documentation of what you did. Your autopsy is your quality control of medical care. Twenty percent of autopsies of clinical diagnoses coming into autopsy are erroneous. Ten percent have major diagnosis impact. What I'm saying is by not having the autopsy I am handicapped in telling you where the primary site is.

Q All right, Doctor.

A Now, there is one thing though that I would like to say that has to do with that last photograph, and that is that we do have one more photograph and it has to do with my suspecting the kidney. And this comes onto this principle -- comes under this principle that says everybody asked me said well, when you look at it on the microscope what do you see. Do you have any clue at all? Does it tell you anything? Could it be lung? And I said yes, it certainly could be. Then they said well, could it be any other organ. And I can guess any organ, but I would say in substance I do suspect the kidney. And they say why do you suspect the kidney.

Well first of all, there was an abnormality, there was a question raised in 1985 I believe or '83, 1983. There was a question raised about a cyst or a tumor in the

kidney, upper pole of left kidney I believe. But there is a report that says -- that said there -- now I know -- kidney pathology from the standpoint of years that it make take before you discover it.

There are times when we have picked up kidney cancer in autopsy several years after a cancer was detected in the body. So that's one of those tumors of uncertain origin that you may not find. It may take several years for the cancer to become evident or never become evident.

But the point is that they suspected it 1983 to '87 is not particularly a long time. It's within my experience, certainly within -- it's within reported experience. There are published reports of kidney cancers being detected several years after a biopsy, in fact, after a diagnosis made that it was something entirely different.

Now, the second thing says that when I looked at it I use that same old principle that says does it look like anything. Well you know, these cells look like kidney cells. So now I have a photograph that says what do kidney cells look like. And one of the hallmarks of a kidney cell is a so-called clear cell.

If you look at these cells you'll see an interesting thing, pink and blue or pink and black. There's a central black round body, roughly round, and it's surrounded by pink. Forget the spaces in between the pink.

But if you think about an egg, if an egg is one -- is a big cell, it really is. Now, in this case the egg yolk is stained black and the cytoplasm is stained pink. You can look at this and say do you see egg yolk. Yes. Do you see cytoplasm, pink? You say yes.

Then I take this next picture --

Q All right. This is Exhibit 473. Let me go through my preliminary thing just a moment here. Did you obtain that photograph, sir?

A Yes, similar operation.

Q You saw that material through the microscope?

A Yes, I did.

Q That is Mr. Richie's tissue?

A Yes.

MR. GRAVES: I request admission of 473.

MR. METCALF: No objection.

THE COURT: It's admitted.

THE WITNESS: Now, if you look at this you're going to see a lot of blue -- a lot of blue things. Every one of these little blue things is egg yolk. And surrounding that is absolutely clear space, just holes just like swiss cheese. Well, I don't know how well that shows. But if you look at it closely -- let's say we take this one right there. Around that is nothing but clear space, no pink.

Where did the cytoplasm go to? Well, it's all filled with either water or some secretory material fluid. What does that mean? Well, it's clear cells. And someone says what do you think about clear cells. You say well, ordinarily associate this with kidney. Someone says only kidneys have clear cells? Well, no. I've seen it at times with lung cancer. Seen it with other kinds of cancers, adrenal cortex. But the fact is -- is that that makes me think of kidney, at which point I would have talk to the clinician.

This is what I do all the time, you know. I see some clear cells. Is there any chance that may be primary in the kidney, anything wrong with the kidney. Well, that's interesting. Yet here in 1983 showed what may be a cyst or tumor. I said well, maybe I think we should -- I mean, my advice would be to explore that there are all kinds of tests that could be done just as, for example, bronchoscopy could have been done to see whether there was a lung cancer, may or may not have been because you can't look at the whole bronchial tree. Bronchoscopy was not done, nor was autopsy. So I'm handicapped. I don't have bronchoscopy. I don't have a urologic exam.

Way back I think in 1973 was the last there was something wrong back then. Could that have been cancer way back then? Well, cancer takes 20 years to develop and it

may -- I wouldn't even want to speculate. All I can say is that something wrong -- anytime you have something wrong it becomes a more likely organ to get cancer.

Q (By Mr. Graves) All right, Doctor. In this case were you confronted with metastasis?

A Yes.

Q Where?

A Well, I have to look at my report to really tell, but my recollection was that there was number of metastases to bone. I believe they talked about bilateral involvement of the lung. That's as far as my recollection goes, but --

Q Let's deal with those for the moment.

A Yeah.

Q First of all, do you recall metastasis of the bone of the right rib?

A Yes.

Q And the right femur?

A Yes.

Q Would you state whether or not, Dr. Sherwin, that is typical presentation for mesothelioma?

A No. No, that's not. You don't -- let me put it this way. When mesothelioma was first diagnosed if you have metastases it was excluded. There was a 1978 publication on the Massachussettes General Hospital in Boston. They published a series of mesotheliomas. They --

one of their criteria was you don't have metastases. In fact, they didn't even want to have the lung invaded. But my own personal feelings if you get a metastasis it swings you away from the diagnosis of mesothelioma. And certainly bone metastasis would not be expected with mesothelioma.

Q Have you made a diagnosis of mesothelioma in the presence of metastasis?

A Not in a high level of the confidence. Yes, I have. In my series there were -- I can't tell you specifically. But remember that the diagnosis of mesothelioma is made with different confidence levels, three different confidence levels.

Our panel made them one, two, three, then there was four and five which were -- which was away from them but you could accept them at three different levels of confidence. If it had metastasis it generally -- if everything else seemed to be strong and I felt that I had to consider it, I couldn't exclude it. It was sort of 50/50. But I would have to get my reports out and all my work to tell you, you know, itemize this.

I can -- all I can say is if you use the general principles metastasis says it's carcinoma and you're not supposed to give it your high level of confidence. I mean, real proof would be to say it's restricted to pleura. There's no lung involved, no invasion, and there's no

spread, then you could be confident if all of the other things were there.

Q Doctor, let's go back to our bone cancer for a moment. Has the source of that cancer been accounted for in any study or in the medical records themselves?

A Not that I know of.

Q Was a biopsy done of the bone?

A I don't know of a biopsy that was done on the bone.

Q Doctor, based upon your review of the medical records and including the clinical progress, anything that you feel is pertinent in this case, do you have an opinion to a reasonable degree of medical probability as an expert pathologist whether the bone cancer is metastatic from a primary cancer of the pleura around the lung?

A Oh, I am confident this is not a pleural primary cancer. This is not a diffuse malignant mesothelioma that has metastasized to the bone. I'm confident of that.

Q Now, let's talk about prostate for a moment. Do you recall from your reading of the medical records that there was a prostate cancer involved?

A Yes.

Q All right. And how many years ago prior to Mr. Richie's death was that?

A You know, I don't remember. It's a few years. I

can't -- I'll have to go look at my record.

Q Some years past?

A Some years past, right.

Q All right. Have you been able to rule out the prostate cancer as a source of the cancer to the pleura?

A Well, I -- with a reasonable degree of medical probability I don't think this is prostate. Why don't I think it's prostate? Well, for a number of reasons. I have suspicions about other things which are much more strongly in favor of them. And secondly, I have that little yardstick that says it doesn't look like the prostate cancer. I have the prostate cancer biopsy, the excision of materials. I looked at it. And I also know that prostate cancer can have a lot of different appearances. So it's -- there is the remote possibility. I could be wrong, but --

Q If we're looking at the tipping of the scale?

A If we are talking about, you know, reasonable probability I would say I just don't believe -- let me put it this way, that I can't exclude anything because I haven't done an autopsy. I don't have a biopsy. If I don't have it, I can't give you answers. All I can say is I don't think it's prostate. It doesn't look like it.

Q Now, have you been able to rule out the prostate as the possible source for the bone cancer?

A No. It's possible you can have prostate cancer lie dormant for long periods of time. So that is a possibility that there could be prostate -- it's not uncommon for somebody to have two cancers or three cancers. There are case reports of people with multiple cancers. So the fact that you had a prostate cancer doesn't at all rule out the possibility that he could have another. And the fact that there is bone metastasis doesn't mean it can't be from the original prostate.

Q How about the kidney? Is the kidney ruled out as a possible source of the bone cancer?

A No, nor is the lung, nor any other cancer.

Q Doctor, let's speak of the size. Is there a necessary size for a primary cancer to achieve in order for it to metastasize?

A No. This -- at one time if you -- if you go on the basis of majority of cases, there's a big -- we've all had the experience of tiny tumors which incidentally is one reason that even at autopsy if you have internists and residents do autopsies and not closely supervise they might miss the primary because it's small. They don't do enough sections.

You take a pancreas it's not nine inches long or something. You got to do a lot of cutting to find the lesion that may be no more than a centimeter, or less for

that matter.

We have been -- we were taught in my training program that you had to look for extremely small lesions and make lots of -- we used to call it bread slicing. You do fine bread slicing.

To give you one figure, where our own hospital had 250 or so tumors of uncertain origin and two out of three of those never ever were identified as to source, one out of the three were by autopsy. But these -- at 17 percent of those autopsies they failed to find the primary site. I think the reason they failed is sometimes they're very small. Sometimes the primary site actually disappears, nature heals it. But looking for it is certainly very important. The Roseweld Park(phonetic) had a 27 percent figure and I think UCLA had a figure in a recently published article I believe of about half of them my recollection it was eastern more than Roseweld Park or Good Samaritan. So this is a common problem if you have a small cancer that's missed at autopsy.

Q All right, Doctor. Let's focus on the lung itself. The interior lung, not the pleura. Can you say to a reasonable degree of probability that the lung has been ruled out as a source of a metastasis elsewhere in the body?

A No. The lung is certainly one of the prime

contenders as the source. I would certain say on the evidence that's available, the clinicians themselves said -- they called it undifferentiated lung carcinoma.

Incidentally I agree with their workup. I think it's a fine workup. I wish they had done a bronchoscopy from the standpoint of the possibility that something might have been done. That's my own personal judgment. And that I think, you know, the argument how much do you want to invest in studying, in searching if even at autopsy you may miss it. The answer is well, there are chances. There are people cured of kidney cancers. You take kidney cancer out and the lung metastases out, there are surgical resections from metastatic cancer, and there are some patients who require it. So I -- I think the lung is an important consideration.

Q And in your consideration did you take into account any of the findings specifically in the lungs themselves? In other words, what can you point to at this juncture?

A Well, the key thing about lung cancer -- if the finding of infiltration in the lung of nodules in the lung that -- when you talk nodules and infiltration in the lung, even if you don't know it's a tumor, let's say you think it might not be. If you have a tumor of uncertain origin you have to consider the fact that any abnormality of the lung

may be hiding a cancer. And the fact is the cancer is causing damage, and you've got the collapse of the lung may be because you've got a tumor obstructing which causes the lung to collapse but you don't see the tumor. Yes, there are reports in case x-rays, many of them saying bilateral infiltration where at least two nodules were found. I think there's a diagnosis saying undifferentiated carcinoma lung metastatic to bone and lung, or something like that.

So the clinicians themselves were suspicious of lung cancer, and they even considered a bronchoscopy. But they felt that even if it were the lung cancer, they didn't think they should do much. Well, that's a judgment call

Q Well, apart from the immunohistochemistry, Doctor, was there a clinical diagnosis made by the treating physicians in this case?

A I'd have to look at my report because I can't remember. For example, with a clinical diagnosis being the surgeon's interpretation after operation, post-operative diagnosis. And post-operative diagnosis, I believe that says undifferentiated carcinoma of lung, carcinoma of lung, metastatic primary and metastatic, or something like that.

Q Without going to your report right this minute, do you recall any of the physicians involved in the treatment of Mr. Richie indicating that the clinical presentation is inconsistent with mesothelioma?

A Yes. That's another thing. They thought -- the clinicians said that this -- the possibility of mesothelioma was quote, "unlikely". I remember distinctly the word unlikely. So the clinicians didn't think it was mesothelioma, which is important to me because if this diffuse part of it says to distinguish between what the clinicians see, does this favor carcinoma versus mesothelioma. And they themselves said that they thought this was unlike mesothelioma.

Q All right, Doctor. Wrapping up our primary test number 1 through 5, what comfort level do you feel with respect to number 5 regarding the existence or non-existence of primary tumor elsewhere in the body?

A Comfort level?

Q Yes.

A Confident. May -- I never used -- I've never -- I am uncomfortable anytime I don't have more material like autopsy, bronchoscopy, and so forth. But I don't have any question that this is a tumor of uncertain origin. I have no alternative to say I don't know where this cancer is coming from, but I strongly suspect the lung.

If somebody said well, we've got to sign this out as something, what are we go to do in the absence of autopsy and whatever, I had to say well I don't think it's to a reasonable medical certainty, but there's no more

evidence in favor of lung than there is in favor of kidney simply because all I got for the kidney is an area that shows clear cells, and the of course the radiologist's statement that there's a tumor or a cyst. But for the lung the clinicians themselves are identifying what they think is undifferentiated lung carcinoma.

So I would go along with the clinicians and say that's what -- I'd rank that higher than I do the kidney.

Q All right, Doctor. Let's go into the other tests.

THE COURT: Is this a good time to take a recess?

MR. GRAVES: Yes.

THE COURT: All right. Let's take 15 minutes. Court is in recess.

(A recess was taken, and the following proceedings occurred in the presence of the jury and on the record.)

THE COURT: All right. You may proceed.

Q (By Mr. Graves) Dr. Sherwin, I'd like to ask you now about the three other tests that you listed on Defendant's Exhibit 475. And the first one is electron microscopy. Is there anything more that you need to add aside from the testimony that you've already provided today?

A No. I still consider those non-contributory.

Q Let's go to histochemistry. What significance did you attach to that and why?

A No significance, non-contributory.

Q Why is that, sir?

A Well, it failed to show mucin. There was no mucin positively so it didn't serve the purpose. If you get a negative finding it doesn't help you.

Q Thank you. Now, let's go to the immunohistochemistry, the materials that you referred to Dr. Barr and Dr. Taylor in the immunohistochemistry department. Who selected the tests?

A Well, I selected them on the basis of the outline I mentioned. I have an associate who actually checks them off under my supervision.

Q Who is that person and what is her qualifications?

A Well, she's a Ph.D who is in research. And this is just a part-time thing that she does for me.

Q Approximately how many antibodies were selected for review?

A Twenty-four or twenty-five.

Q And this was from the battery established by Dr. Taylor?

A Yes. We have a routine panel. And I usually say just check off the routine unless there's some special

need.

Q Now Doctor, let's look at immunohistochemistry. In general can you state whether or not you are apt to get variances between laboratories dealing with the same test?

A Very definitely.

Q Did we have such a problem in this case?

A Yes.

Q In what particular test?

A The keratin.

Q And what significance did you attach to that?

A My first thought was we either had an antibody difference -- they're all commercially available. And you buy it from one company and it may be different, or you may get a batch from the same company but it's a different manufacturing date or some sort. So I thought there might be a variation in the antibody. The other possibility was that for some reason we don't have exactly the same tissue that they tested. So maybe the tissue we have that changed its character and the keratin was a different kind of keratin. Keratin comes in all kinds of -- it's just like body weight. There are different weights. And the keratins come in different weights.

Q And as a consequence of that variance did you take a further step with respect to the keratin?

A Yes. I just had another section processed for

what we call pan keratin. And pan keratin has all the keratins in it.

Q And did you find some?

A Well, most all the keratins, not all of them.

Q Did you find some consistency then with prior reports as a consequence of the pan keratin test?

A Well, both Dr. Taylor and Dr. Barr reported that the pan keratin was positive.

Q Now, having reviewed the Barr and Taylor reports submitted to you can you state whether or not their diagnosis led you away from mesothelioma?

A No. They favored carcinomas. I didn't put -- put any significant weight on that. I had already come to my conclusion. And I just simply accepted that. It's another arrow pointing a little bit towards carcinoma, not -- as I say, not a lot of significance in terms of weight.

Q Now, you are aware at that Dr. Barr's deposition was obtained?

A Yes.

Q You read it last night as I believe you told us. You were aware that she was subjected to cross-examination?

A Yes.

Q And as a pathologist, Dr. Sherwin, requesting an immunohistochemistry opinion from somebody like Dr. Barr,

is it of significance to you to know whether or not she changed her opinion as a consequence of the cross-examination by way of deposition?

A Well anybody's change of opinion would have some significance. But again, remember those are ancillary techniques. And the simplest way to understand that is we have an old saying that I grew up with a dog that wags its tail, and tails do not wag the dog. These are the tail kinds of things.

Q What conclusion was reached by Dr. Barr in her deposition regarding her immunohistochemistry finding?

A As far as I can see essentially from what was in her report she favored carcinoma.

Q And is that consistent with your opinion in this case?

A Yes.

MR. GRAVES: I have nothing further at this time.

THE COURT: Cross-examine.

MR. METCALF: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. METCALF:

Q Dr. Sherwin, when you come to court and testify like you have today you generally charge for your time, don't you, sir?

A I do, yes.

Q And what do you charge at this time?

A Let's see, I have a standard rate which is $200 an hour for consultation, 250 for deposition, 300 for trial. My sleeping time doesn't count. My travel time is usually on the basis of what I do. If I do nothing it's -- I think it's a 50 percent figure. If I do consult on the plane, then I charge that on consulation rates.

Q And so when you looked at the slides and what not in this case for Tilly & Graves you were charging $200 an hour?

A That is correct.

Q When your deposition was taken you were charging $250 an hour; is that correct?

A To you people.

Q And when you're here testifying you're charging $300 an hour?

A That's correct.

Q Do you have a reasonable estimate, Dr. Sherwin, of the number of cases you reviewed since 1985 for attorneys representing defendants?

A Well, I wouldn't want to rely upon, you know, my casual memory. All I can tell you is -- is that the past two years I've done something like 30 or 40 cases per year, something in that ballpark, couple dozen, three dozen. That's as best as I can tell you. It's difficult to keep

track of them because I may do a case this year that somebody gave me two years ago.

Q Since 1985 you've given over 100 depositions in cases of this type; is that correct?

A Well, I don't want to try to tally them. I would say that's a fair estimate, but I don't want to be on record as saying how many depositions. Hundreds. I know I testified earlier to that number, but I don't know what that number is right now.

Q Okay. So if it was 100 two years ago, it would be more than that now; right?

A If it was let's say 24 to 34 in that range per year.

Q Okay. Now, it's true, isn't it, Dr. Sherwin, that in 1990 alone you prepared over 100 reports for attorneys representing defendants on a review of mesothelioma cases?

A I don't know. I can't go back to 1990. My best is '91.

Q Well, if you saw your testimony under oath of July of 1990, would that refresh your recollection?

A Well, if you have a record of what I said back then it would help.

Q Do you remember the case of Edward Casey(phonetic)?

A Not by name, no.

Q That's -- we took your deposition, and Mr. Graves was there. Do you remember that, out in Los Angeles?

A I have a difficult time keeping track of all these names because I do consults other than asbestos. And we have medical students and colleagues. Names are very difficult to keep track of.

Q Let me show you. This is the deposition of Russell P. Sherwin; is that correct?

A That's correct.

Q Okay. Were you asked this question and did you give this answer, Dr. Sherwin, can you give me an estimate of the number of reports you have written on a review of mesothelioma cases that you have done at the request of attorneys representing asbestos -- or former asbestos product manufacturers in 1990 so far. Well, I would say I have done over a hundred. I don't believe I have done more than 150, but it is possible. But I would say it is in that range. Is that correct?

A Well it looks like so far -- sounds like reports up to that time, up to 1990.

Q Well --

A For that one year.

Q Question was in 1990 so far, wasn't it?

A Well, I don't know what that translates to. If

you ask me how many reports I make, if I do 30 to 34 cases per year and you go back to '85, there may be some years where there were more reports. So I can't -- I have no way of knowing. But that's my -- that's my recollection.

Q You're also asked on page 31, can you give me an estimate of the total amount that has been billed for the 100, 150 cases we're talking about for 1990. No, I can't. Is that a --

A Well, no I can't do that since I have no recollection of those kinds of numbers.

Q Apparently you were little busier in 1990 than you are today writing reports on these cases; is that correct?

A Well, it surprises me to think that I may have done 100 in that year, but it's possible. I can tell you what I've done the past two years.

Q And when you write a report, Dr. Sherwin, that's when the lawyer asked you to write one where you've decided that it's not mesothelioma; right?

A That's correct.

Q So at least in 1990 you reviewed at least 100 mesothelioma cases for attorneys representing asbestos companies and decided they were not mesotheliomas; true?

A Well, that's assuming I wrote 100 reports. If that were true, then that would be the case. I've

written -- well, I don't even know how many reports I've done this year, but I don't believe -- I don't have a number. I better not try to guess. But let's assume that that year had 100, then it would be 100 that were not mesotheliomas. That's surprises me. But that's one of the problems to answering those questions at depositions.

Q Now, you do not consider yourself to be an expert in immunohistochemistry, do you?

A That's correct.

Q There are other people who are experts in immunohistochemistry, and you defer to them when it comes to interpreting immunohistochemistry; is that correct?

A That's correct.

Q And you do not consider yourself to be an expert with regard to the ultrastructure of mesothelioma; isn't that true?

A No, I would say that I am an expert for the purposes I have in mind. In other words, electron microscopy has different degrees of specialization. And I am not an expert in the sense of doing electron microscopy full-time, of the running the machines, and knowing -- knowing all of the ins and outs of the electronics. And I also don't do much more than say cases that refer to mesothelioma. So from that standpoint -- although I have in the past. I've done breast cancers as a grant-supported

project. But I have enough capability, it's like a GP delivering babies. I can do the basic work.

Q But you've done no specific study with regard to the ultrastructure of mesothelioma; isn't that true?

A Well, not a special report, that's correct. I haven't reported any literature on mesothelioma in terms of that particular subject, correct. I have on other subjects.

Q Dr. Sherwin, just so we clear this up, you are not on the United States Canadian Mesothelioma Panel, are you?

A That's a different panel. I never was on it, right.

Q You're not on it. That panel began in 1985; right?

A Yes. I ended my service with the United States Panel in 1985.

Q And that panel was disbanded then; right?

A Yes, that's true.

Q That's right. And then a new panel was formed in 1985, the United States Canadian Mesothelioma Panel; right?

A Not quite true. The Canadian Panel was in existence most of the time for probably as long as the US panel. When the US panel disbanded or whatever happened there, the chairman died, and no one picked it up.

Dr. McCoy, who was the chairman of the Canadian panel, invited some members of this panel onto his panel.

Q And then it became the US Canadian Mesothelioma --

A He so designated the US Canadian panel. To my knowledge it's not a World Health Organization sponsored or certified organization.

Q You were not invited to be on that panel, were you?

A He did not invite me.

Q You've not been invited since that time, have you?

A That's correct.

Q It's changed over quite a bit as a matter of fact since that too?

A It's changed over the years, new members. I think he's rotated membership considerably.

Q And as new members have come on that's not included you, has it?

A Well, I think he's trying to. Well, hasn't included me, correct.

Q Now, have you been advised on this case Dr. Samuel Hammer, who is a member of the United States Canadian Mesothelioma Panel, testified that in Mr. Richie's case that that panel would have no difficulty deciding that

in Mr. Richie's case it was mesothelioma? Did anybody advise you of that?

A Nobody told me that.

Q Dr. Sherwin, you heard of the saying out of step. Do you know what out of step means when you say somebody was out of step?

A Yeah. I was in the Army.

Q You have a lot of people supposed to march left, right, left, right. Somebody else would get right, left, right, left is out of step; right?

A Right.

Q You've actually had the opportunity, haven't you, Dr. Sherwin, to have your ability to diagnose mesothelioma compared directly with pathologists who have specific expertise in diagnosing mesothelioma, haven't you?

A You know, that's not really true. I thought so at first. But when I delved into it, it turned out to be not the case.

Q I see. Well, let's talk about that a little bit. Now, you discussed how in 1984 a paper was published and about the incidence of mesothelioma in Los Angeles County; is that correct?

A That's correct.

Q And as part of that workup you reviewed pathology on cases that had been diagnosed as mesothelioma from

various hospitals in the Los Angeles area; true?

A Yes, over a period of about three years I reviewed 164. Well, more than that, but 164 published.

Q Then there were other people who were authors on this paper who used your review to decide whether or not the incidence of mesothelioma in Los Angeles County was increasing or not; isn't that right?

A Yes. In other words, I was kept apart from the epidemiology. I simply did the pathology.

Q And then the epidemiologist said okay, based on what Dr. Sherwin told us we'll decide whether the incidence of mesothelioma in LA County going up or not?

A That's correct.

Q In other words, they were relying on the accuracy of your pathology review to make their conclusions about the incidence of mesothelioma in LA County; right?

A Well, the validity.

Q Right, the validity.

A It was a validity of diagnosis that had been made. No one thought Sherwin was the only person that would -- in the world who could do this. I think you should understand that the timespan itself has a 50 percent disagreement average. And I think it's very important to realize that having been a member of the panel, of these two panels, is very unusual to have a complete agreement.

And Dr. McCoy has published that, that it was unusual to have all members in agreement. So there's a lot of variation between members.

Q Let's talk about this paper for a minute. You were the only pathologist in this paper?

A That's correct.

Q After your review of the pathology material you decided that you would only confirm if you looked at the cancers 29 percent of those as mesothelioma; is that correct?

A That's correct.

Q And then the paper was written up and published with the other authors relying on what you told them decided that the incidence of mesothelioma in Los Angeles County was not increasing; isn't that true?

A That's correct. Well, once they looked at my figures they realized that the incidence was really not increasing. That is the conclusion.

Q And you had confirmed only 29 percent of these possible mesotheliomas; right?

A Absolutely, right.

Q And in 1985 is when you first began testifying for defendants in asbestos cases; right?

A That's correct.

Q Okay, and --

MR. GRAVES: I'll object to the form of the question, Your Honor.

THE COURT: Overruled.

THE WITNESS: Well, yeah. I began living my litigation is really what that means. My first litigation was in 1985.

Q (By Mr. Metcalf) In 1985 is when lawyers representing asbestos companies first began asking you to help them out in cases where people had gotten sick or died from mesothelioma?

MR. GRAVES: Objection to form.

THE COURT: Sustained.

THE WITNESS: Well, the other people -- I had plaintiffs ask me too. Initially plaintiffs asked me. I think my low frequency discouraged them.

Q (By Mr. Metcalf) You know of the Defense Research Institute, don't you?

A Yes.

Q That's a group of lawyers that, for example, represent asbestos companies in cases like that; isn't that right?

A That's correct. Well, I don't know much about it. I was invited to give a talk, one of my presentations.

Q That's a lawyer group and not a group of doctors; right?

A Well, I was invited among a lot of other physicians, including Dr. Churg.

Q That was in 1985 when you talked to the Defense Research institute, isn't it?

A That's correct.

Q And you talked about mesothelioma at that time; right?

A Yes.

Q Now, in 1986 there was another paper written up and published that discussed these same LA County mesothelioma cases; isn't that right?

A There were two papers.

Q Well, let's talk --

A 1986 was one, and there was a followup. '86 had two papers. One was a followup on the one you're talking about.

Q Let's talk about the one, Results of Pathology Review of Recent US Mesothelioma Cases. Remember that one?

A Yes. I can't -- I'd have to look at it to tell you what's in it, but I remember the article.

Q And in that paper there were two pathologists with specific expertise in diagnosing mesothelioma; right?

A There were five of us.

Q Right. And two of them were identified as Dr. Wagner and Dr. Hochholzer as having specific expertise

in diagnosing mesothelioma; right?

A All five panelists had expertise. They were called referees. There was a panel of five of us. They ran into trouble with the panel and decided to narrow it down to two people.

Q Dr. Wagner and Dr. Hochholzer were the referee pathologists; isn't that right?

A That's right.

Q And in cases of questions then they looked at the available tissue material, didn't they?

A Material I supplied them from -- that I supplied them and other people supplied them.

Q Sure.

A That's correct.

Q Now, the 1986 paper again discussed whether or not there was an increasing incidence of mesothelioma in Los Angeles County?

A That's correct.

Q The conclusion in 1986 is that there is an increase in incidence of mesothelioma in Los Angeles County; right?

A Based on the registry not -- that's important to understand that article says because the panel had so much disagreement we had to revert to the registry diagnosis. You read that. And in other words, they set out to give

the panel -- the panel didn't work. We were so much in disagreement, so they finally got the referees. And their comments in this first paper was as follows: we think that even though we -- using registry, diagnosis registry, means exactly the cases I look at, even though we're using the registry we think it's -- it's valid because the two referees agreed on the higher percentage than --

Q -- you did?

A Than I did. But there was also other New York State and veterans cases as well. However, you should know this, I went up to Dr. Spirtas, who was a director, and I said I would like to compare their results with my results. And I found out that they weren't available. And the reason they weren't available was when they disagreed they went up to a double-headed microscope. That's in that report.

Q That's in the other 1986 --

A It's in the other report. How they did it, they went into a double-headed microscope and then they hashed it out, and then they reached one diagnosis and they threw away their disagreement. So how can you compare a consensus or that conjoint agreement with me? I'm an independent person. I don't know how Dr. Hochholzer and Dr. Wagner would have agreed on my cases. First of all, they had -- they only had several days to go through 200 --

no, 164 cases that I took two and a half years or three to do. I supplied them with one slide that I selected. They had access to the others. As far as I know they never did anything but tearing up their agreement -- I mean, tearing up their disagreement. Then you're coming up to me and saying they agreed that these were acceptable when in fact there is no such documentation. And that's a matter of record.

Q Finished?

A Well, I think it's an important thing to say.

Q Good. In the 1986 paper 64 percent of the Los Angeles County mesotheliomas were determined to be mesotheliomas; correct?

A On that conjoint basis by those two referees, not by the the panel.

Q And at that time both Dr. Hochholzer and Dr. Wagner were on mesothelioma panels; right?

A They were -- no, there were five of us on the panel. They were there.

Q Dr. Wagner was a member of the European Mesothelioma Panel in 1986; right?

A Well, I'm not sure about that.

Q Dr. Hochholzer was member of the US Canadian Mesothelioma Panel in 1986; right?

A Well, that is probably true, but I can't -- I

can't tell you.

Q When they reviewed LA County cases they decided that instead of 29 percent being mesothelioma, 64 percent were mesothelioma; right?

A Essentially doubled it as a conjoint agreement, correct. But that data was not used in that report. They reverted to the registry and they disregarded the panelists. They cut us from five to two. I'm only telling you that because what you're saying is not a fair comparison.

Q The comparison is that they were able to confirm more than twice as many mesotheliomas as you were; isn't that true?

A As a conjoint thing. But you see, the purpose of a panel is just like the jury. They have got to come to an independent opinion and then say what do you think. You can't -- they're not supposed to discuss the case among each other. They discuss the case among each other now. That's not coming to an independent opinion. I did it totally independently.

Q Now, in the other paper in 1986 they specifically discussed the method of the pathology review, didn't they?

A Yes, they did discuss it. It's a very extensive discussion, very complicated.

Q And in that case there was a meeting where you

all got together, Dr. Wagner, Dr. Hochholzer, you, and two other local pathologists; right?

A That's correct.

Q And you reviewed each other's materials?

A Not true.

Q Well, you reviewed your materials and you reviewed your --

A No, that's not true either. There were 74 problem cases that Dr. Wagner and Dr. Hochholzer identified. We only reviewed those cases they thought was the problem.

Q Well, those problem cases you only confirmed the diagnosis of mesothelioma in 20 percent, right?

A They're problem cases. You can't compare that to a general series.

Q That's right. And Dr. Hochholzer and Dr. Wagner even after meeting with you and reviewing them you only confirmed 20 percent; correct?

A I don't -- I don't remember. That sounds about right.

Q And they confirmed about 65 percent of them?

A They're higher. A panel, if you have a 50 percent average there's going to be some people at 30 and there's going to be some people at 80. They're at the 80s.

Q In fact, of the five pathologists, there's no question that you were the low man on the totum pole in terms of confirming mesotheliomas; right?

A Well, I don't think -- I like to think of it as a person sticking to the science of it and looking for proof and documentation. I think that's the difference. I think I had structured criteria and followed them.

Q Or maybe you had a different understanding about the diagnosis of mesothelioma then Dr. Wagner and Dr. Hochholzer; is that correct?

A My understanding is what's spelled out in this chart. You people have to decide how that conforms.

Q Now, in this case there were three other board certified pathologists who have testified. Are you aware of that? Dr. Giorno from Mercy Hospital testified that in his opinion it was mesothelioma; is that correct?

A Well, I understand there were three others.

Q Dr. Hammar testified it was mesothelioma, Dr. Abraham.

A Correct.

Q Other than yourself have you seen a report from any other board certified pathologist who reviewed that material who decided it was not mesothelioma?

Q How about Dr. Case? Is he -- I don't know his background, but he certainly reviewed the materials.

Q Well, we'll talk about Dr. Case.

A I don't know about Dr. Case, but I remember there was a report by him. Numbers -- numbers are not the same as evidence.

Q That's right. You might have 50 people marching in line left, right, left, right, and one person is doing right, left, right, left. But that's not evidence; right?

A It's the relative convincing force of the evidence, not the number of witnesses. That's my theory.

Q Now Dr. Sherwin, your opinion in this case is that Mr. Richie had tumor from someplace you don't know where; right?

A That's correct.

Q You are quite confident, however, that it's not a melanoma; right?

A Yes.

Q That it's not prostate; right?

A Yes, reasonably confident. Without an autopsy I have -- it's difficult. But I would say yes.

Q Now, do you remember in looking at the medical records, Dr. Sherwin, whether or not a Dr. Mark Barter was Mr. Richie's primary physician?

A I'm very hard on remembering names. I can't tell you that. But if you look through the reports, some of these are identified and some aren't. I'd be glad to look

at the report.

Q Well, let's take a look at what Dr. Barter said when Mr. Richie finally went into the hospice to die. He had a discharge diagnosis; right? Are you familiar with what a discharge diagnosis is?

A Yes, I'm looking at it. I'm reading it. I'm trying to see what he's saying.

Q Well, what he's saying is he had mesothelioma presenting in January, 1987 with malignant bilateral effusions; is that right?

A Well, that's his comment, right.

Q And he said he had prostatic carcinoma in June of 1983; right?

A Well, correct.

Q Well-differentiated. He had sarcoidosis of long standing; right?

A Yes.

Q He had hyponatremia?

A That's what he said.

Q Probably had to do with the cancer and the treatment to the cancer; right?

A I can't second guess it.

Q He had a tonsillectomy and adenoidectomy; right?

A Yes.

Q He had a hernia repair? Cataracts?

A Everything you're reading is right.
Q Is there anything in here about kidney disease at all?
A Not in his report.
Q Is there anything in there about lung cancer?
A Not what you've just read.
Q So assuming Dr. Barter was Mr. Richie's primary physician, he didn't even consider that Mr. Richie had kidney disease; right?
A Well, I don't know that. In that report he doesn't put everything he thinks down in this discharge summary. From that one statement it doesn't mention kidney. I have no idea whether he discussed that problem with anybody or not.
Q Other than in 1983, the statement on a bone scan of questionable tumor or cyst in superior pole of right kidney, is there a mention in his records that you saw anywhere about kidney disease?
A Well, that's the only record I found that indicated to me a suspicion of something wrong with the kidney that might be. That's the only record I found.
Q That was in 1983; right?
A In terms of information that's --
Q That's it.
A That's a finding as opposed to an opinion?

Q They found something that was questionable.
A Well --
Q That's what it says?
A This whole case is questionable.
Q I see. Now Dr. Sherwin, if the gross appearance of the tumor was enough to make the diagnosis you pathologists could throw your microscopes away; right?
A Well, the statement I would like better is no one should make the diagnosis with any one criteria.
Q Well, let's talk about the gross appearance of the tumor in Mr. Richie's case. The truth of the matter is that in mesothelioma can be a uniform rind of tumor. But it has other appearances, doesn't it?
A You'll have to tell me what they are.
Q Okay. Well, isn't it true, sir, that total encasement of the lung by tumor is a feature of lung cancer as well as mesothelioma?
A Oh, well lung cancers can have total encasement if that's what you're asking. Kidney cancer, pancreatic cancer, a lot of other cancers.
Q Total encasement doesn't tell you whether it's mesothelioma, whether it's lung cancer, whether it's some other kind of cancer?
A That's one of the real reasons why you have to do an autopsy in a case like this for sure if you have

encasement, which you don't have.

Q The absence of total encasement of the lung, however, doesn't tell you whether it's mesothelioma or not either, does it?

A Oh, there's no relationship to those two statements. Carcinomas ordinarily don't encase the lung.

Q Isn't it true, sir, that in your opinion encasement of the lung can be used to differentiate lung cancer from mesothelioma? Isn't that true?

A Well, it's true that -- well, if you get back to my original statement, no one criteria by itself can be used alone. I mean, you can't use any one criterion by itself.

Q Do you remember doing a workup for a lawyer at Boble & Gates(phonetic) in Portland, Washington on a Mr. Phillips?

A No, but I may very well have done that.

Q Does that look like a report you sent to the law firm of Boble & Gates in Portland?

A Yeah, it does, correct. That's my report.

Q In this report you say here, don't you, that while there is encasement of the right lung, apparent obliteration of the pleural space, this is a feature of lung carcinoma as well as diffuse malignant mesothelioma; right?

A That's an absolutely correct statement.

Q Okay. All right.

A In fact, as I mentioned there were some entities that go by that name pseudo mesothelioma carcinoma of the lung. But there are other forms that encase the lung as well as incidently even local mesotheliomas can do that eventually. So that's an absolutely correct statement.

Q When you, for example, in the Phillips case found total encasement of the lung you still concluded that Mr. Phillips didn't have mesothelioma; right?

A I have to read the report, but I assume that's what it says. But that's very logical. In other words, what it's saying is that you can't use any one criteria by itself. These are not absolutes. There is encasement. That can be produced by other cancers. This is one of the reasons why you have to do an autopsy if you really want a high level of confidence. But anyway, we don't have encasement.

Q That's right. Now, Dr. Hammar when he was here talked about Dr. Henderson and some other folks that wrote a book on malignant mesothelioma. You're familiar with this book, aren't you?

A Yes. I have a copy.

Q And these are respected pathologists; isn't that true?

A Well, I have no way of judging what you mean by respected. People who write and people who have experience are authoritative. That's the word I use if you have experience and you write papers on it. And they're generally published in peer review journals and it's authoritative.

Q Now, it's true, isn't it, sir, that mesotheliomas typically have a nodular appearance?

A There are -- there are opinions saying that you can find nodular presentations and you can find studies but they're anecdotal. They present these implying that they're early stages. But no one has ever published a scientific paper saying that they have identified a diffuse malignant mesothelioma before it became diffuse. In other words, I can't make a diagnosis of a diffuse malignant mesothelioma unless it's diffuse. If you're going to show me the first picture in there, I would say that's a good example of it.

Q It's an entire book on mesothelioma; is that right?

A That's correct.

Q And the first picture in this book on mesothelioma?

A Looks to me like metastatic nodular cancer.

Q That's right. This is in Dr. Wagner's --

A Yeah.

Q What is this and what does he say here? Says this is a malignant pleural mesothelioma?

A Well, he says so, you bet. That is an anecdotal statement.

Q Why would he pick that one to illustrate the first thing in the book?

A Very surprising to me because almost every text book you will look at you pick any text whether it's Dr. Churg or whether it's Sam Hammar or whoever, they'll show you a picture of a rind of cancer encasing the lung. They don't show you that picture. That's a classical picture of metastatic carcinoma to the lung. And I'm absolutely surprised that he would put that in there.

Q So again, Dr. Wagner, who has probably written more about mesothelioma than anybody in the world. Has selcted this/, but you would disagree that this is mesothelioma; right?

MR. GRAVES: Object to form.

THE WITNESS: You don't think I'm entitled to --

THE COURT: Overruled.

THE WITNESS: -- question people who write a lot?

Q (By Mr. Metcalf) Absolutely.

A Well, then I'm questioning it. I am saying that kind of nodular picture -- this in my experience is typical

for carcinoma. I have seen that over and over again with carcinoma. Conversely, the pictures you will see in every standard text book, you pick out any other text book and you'll see that they all show a thick rind. And that's how it's described, a rind of cancer that encases, nodules. McCoy has specifically said in his original one of his article nodularity by and large favors carcinoma. A sheetlike thickening favors mesothelioma. That's what I go by.

Q Okay. Other people may have a different view of it; is that correct?

A Well, McCoy is the chairman of that US Canadian panel. That's what he said.

Q We'll talk about that more in a minute. Dr. Wagner, however --

A Who do I believe?

Q Dr. Wagner, however, selected this picture to illustrate the very first picture of mesothelioma in this book; right?

A Yes.

Q And that picture from Dr. Wagner shows a nodular appearance to it, to a mesothelioma; is that correct?

A Well, that's what he's saying. And he's not the only one who has said that. Other people have claimed that as an early stage of diffuse malignant mesothelioma because

if you look at that picture there's a lot of pleura that's free of cancer.

Q Right. That's right. So --

A No, it's not a diffuse cancer by definition. It's not diffuse by definition.

Q Doesn't fit your definition of diffuse?

A Doesn't fit the definition of diffuse. It doesn't fit the definition of encasement. How much -- how much covering do you want to make a diffuse --

Q Well Dr. Wagner apparently doesn't think it needs to cover every square centimeter of pleura.

A Well, it isn't every square centimeter. There's a lot of square centimeters. And I would disagree strongly with that.

Q You have a different definition of diffuse?

A I'm not the one who has the different definition. I've cited all these text books, and I'm saying if you consult anyone of these standard text books, and there must be a dozen of them, you will find a picture of a rind. You will see this in that text book, you'll see in Dr. Hammar's book, you will see it in Dr. Churg's book, you'll see it in standard pathology text books. It's a rind of cancer. That's the hallmark of a mesothelioma.

Q Let's see what Dr. Hammar says in his chapter in his book on Pulmonary Pathology. Does he say here that in

early stages of some mesotheliomas they can be associated with nodular excrescency of tumor?

A Yes. That's his speculation in the early stages. We're not talking about early stages. We're talking about diagnostic stages. We are saying you can't diagnose diffuse malignant mesothelioma unless it's diffuse. And if you think it's early, you're speculating. There is no scientific papers showing the early stage of mesothelioma.

Q Well --

A Diffuse.

Q We'll keep talking about that.

A Yeah.

Q Here is the picture Dr. Hammar illustrated in his book with nodular excrescence of tumor?

A For the early stages. But look at what he shows for the classic anecdotal early stages. You can't confuse the exception and speculation with what has been classically the presentation of a diffuse malignant mesothelioma.

Q Well, is it your view that early mesothelioma looks the same as mesothelioma at autopsy?

A There are two early -- one is the development, and that's what we're talking about. The autopsy can be encasement for any number of reasons. I mentioned, for example, local cancer or carcinoma can encase a lung simply

by spreading. So you have to make the diagnosis on the -- incidently we're talking about arrows against your confidence level is high if it is a rind of cancer. If you have nodular presentations and you're claiming it's an early stage you're speculating and your confidence has to be slight. That's what getting us into muddied areas of confusing the classical presentation with the early speculation.

Q You're familiar with Dr. Churg's book?

A Yes.

Q Dr. Churg is a current member of the current mesothelioma panel?

A Yes. Are you going to show his typical picture of a mesothelioma?

Q Let's see what he says about early disease seen surgically.

A Okay. This again is a speculation.

Q Okay. Dr. Churg is speculating too; right?

A He is. There's no documentation on this anecdotal. You don't see a citation saying here are a series of cases at which we saw this and then follow it up.

Q He says here in early disease seen surgically the tumor appeared as scattered nodules over other pleural surfaces.

A The first part says it has been suggested that

pleural mesotheliomas start on the parietal surfaces, but in early disease seen surgically the tumor may appear as scattered nodules over either pleural surface. I think it's important to say this whole thing is talking about a speculative area.

Q That's your opinion?

A Well, he said early. I didn't put that in there. He's talking about early. There's no documentation for early stage.

Q Well, apparently you think Dr. Churg just fished this thing out of a dream one night, or that's what he says?

A Anecdotal comments or whether it's flying saucers or whatever are very common. A lot of people have personal experience with drug treatments. That's why do you controlled studies. That's why you have to have placebo trials. That's why you have to get the national institutes in and have a peer review, say let's verify this. The early stages have never been validated.

Q Dr. Joe Corson is a pathologist who is a current member of the US Canadian Mesothelioma Panel; right?

A Yeah.

Q Who is -- Dr. Corson has published and written extensively on mesothelioma?

A Yes. I've seen his picture of an early stage.

Again, it's -- these becomes what is known as a -- as a -- as a common fashion. Again, there's that magic phrase, early stages.

Q That's right.

A Let me qualify that. If I gave that to a medical student or if I were examining somebody and I showed them that picture and they said that was an early stage of mesothelioma and not carcinoma, I'd flunk him.

Q Okay.

A So what they're saying is that they think that this might be -- be -- be what goes on into a diffuse. Nobody knows. But that is the picture of metastatic carcinoma. So why would you choose an early stage of mesothelioma over metastatic carcinoma? Show that to any pathologist without telling them what it was called. And if they don't say that looks like metastatic carcinoma, I'd be very surprised and very concerned.

Q Dr. Corson is not a medical student. He's a member of the mesothelioma panel; right?

A But he's trying to tell you we don't know where this comes from. He'd like to explain to you what he thinks is an early stage. That's not what he's telling you a mesothelioma is, and he's also not denying that that's carcinoma. He's saying that we really don't know, but this is what he thinks is an early stage.

Q What does Dr. Corson say on page 179 of this book? Just read along with me.

The gross features of DMM have been well described in the early stages of DMM of the pleura proliferating malignant mesothelial cells form tiny gray plaques or nodules on the parietal and visceropleura which then collates forming larger nodules. Is that what it says?

A Yes. You know, citations on gross features that have been described, but you don't see a lot of citations coming after this one.

Q Well, do you think maybe the citations saying well described include that?

A Definitely not.

Q Okay.

A Definitely not, unless it's an anecdotal one. Like I said, there is no scientific report saying here are so many of these early stages. Well, I know this, if you just look at the recent literature on chest surgery where the surgeon will say that we don't think -- we don't -- for example, there's a very recent article stating that treatment surgically of mesotheliomas is probably ever going to be useful because we think at the very outset they're already multi-focum we believe at the outset. But that's again, we believe. So we're talking two different

things. I don't understand why that isn't clear.

Q So far Dr. Hammar is speculating about nodularity, Dr. Corson is speculating about nodularity in early mesothelioma, Dr. Churg is speculating about nodularity in mesothelioma. That's your view?

A We went through exactly the same thing with breast cancer. Everybody said you had to have a radical mastectomy until someone named Rose Cushner(phonetic) says I don't care what those doctors say. You don't have to have a radical mastectomy. And California passed a law to tell these doctors that they've got to give women an option. And there are other procedures besides radical mastectomy.

Doctors can fall into a system of belief that gets promulgated without the evidence. And the evidence says you don't have to have a radical mastectomy. But doctors are very reluctant to follow that kind of evidence. They don't -- they go by this common belief. They all say this is the way to do it. This is what we believe. And you have to forget a Rose Cushner coming along and say what's the evidence. And when they went into the evidence they found somebody out of step, a British surgeon who said you can do lumpectomies and radiation and get just as good results. He was out of step. Now he's in step of course.

Q Now, would you agree, sir, that a surgeon in a

particular case, surgeon provides clinical treatment; is that right? He's one of the clinicians that you talked about earlier?

A That's correct.

Q And in this case did you see in the manner in which the clinicians described the gross appearance of Mr. Richie's chest cancer?

A Yes, I did. And I have in front of me 2/7/87 operative report. And here post-operative diagnosis is probable malignant metastatic tumor. So I thought it was metastatic tumor, which is exactly what I would have expected.

Q What else does it say? Does it say pending further studies?

A Well, that's his post-operative diagnosis. When he looked at that he said in his experience that kind of plaque formation, whatever he was seeing, nodules looked like metastatic cancer. And that's what I'm saying, it looks like metastatic cancer. I accept that.

Q Well, let's take a look at it and we won't have to argue about it.

A Okay.

MR. GRAVES: What's the date, please?

MR. METCALF: This is if February 7, 1987 previously marked as Plaintiff's Exhibit 16-1.

Q (By Mr. Metcalf) With the thorascope, that's a procedure that goes in your chest to look around; right?

A That's correct.

Q One millimeter to 20 millimeter plaques were encountered on the visceropleura, parietal pleura, and diaphragm. A number of biopsies submitted for examination and on frozen section found to be compatible with an anaplastic malignant tumor. The type will be determined with further permanent stains. That what it says?

A He said he was deferring to the pathology, but his opinion was metastatic cancer. Probable malignant metastatic tumor. That's what we're -- that's what that whole diffuse is all about.

Q And he says the type will be determined with further permanent stains; right?

A Pathology can't tell them what the tumor looks like. He's the one who tells the pathologist this looks like metastatic disease. He's waiting for the pathology to tell him what kind of cancer it is. And in their first report was anaplastic carcinoma. But the pathologist is relying on that surgeon to tell him what that gross appearance looked like. Did it look like encasement or did it look like metastasis. And he said it looked like metastasis. I accept that.

Q Well, in fact it looked like the picture in

Dr. Corson's book and in Dr. Hammar's book, didn't it?

A Thank goodness he didn't call it early stage of mesothelioma. I think it's his diagnosis based upon his experience was much more rational.

Q Did you see the March 12, 1987 surgical report?

A Yes.

Q And does Dr. Parker, the surgeon there, describe what the gross appearance of the tumor is?

A Well, yes. At that time he says grossly this would be consistent with mesothelioma. And I think he's being influenced by the pathologist. I think the answer to this is the clinicians are right. The pathologists have taken them down the wrong track.

Q Okay.

A I think the clinicians are right.

Q Doctor Parker is one of clinicians; right?

A Well, we're talking about the clinician who looks at the gross examination. The treating physician did not look through the thorascope.

Q So the surgeon who looked at it said -- Dr. Parker, March, 1987, grossly, this would be consistent with mesothelioma; right?

A That's his statement at this time.

Q Okay. And you agree with that?

A No, I don't agree with that. I think he's being

influenced by prior pathology diagnoses.

Q So you disagree? You think the clinician then is wrong here; is that right?

A No. He's saying if you fellows think this is meso, then I'll go along with it. I thought it was metastatic. That's what he's saying as best as I can tell.

Q Does he refer to the pathology in this here?

A Well, only a pathologist can make a diagnosis of mesothelioma. So if he thinks it's mesothelioma, I would assume that between the time he thought it was metastatic and the time of this operation he's been influenced to say well if you people are thinking mesothelioma, then it could be. I -- now, I don't read his mind. All I'm saying is that presentation that he initially saw -- your best chance is what did he see initially. And I go by his metastatic.

Q Do you want to look at that?

A Plus all the others.

Q Do you agree with Dr. Barter when he says the man had mesothelioma?

A Who was Dr. Barter?

Q That's Mr. Richie's primary treating physician.

A Well you see, only a pathologist can put all the pieces together. So if you don't have a pathologist's interpretation you're not anymore than I can give immunohistochemistry expertise. Those are the people who

give you an answer. The only person who can tell you whether this is a mesothelioma or not or render a diagnosis with authority is going to be a pathologist.

So you can't look at a clinical interpretation. What you can look at is a descriptive, objective interpretation. And that descriptive, objective interpretation says this looks to me like metastatic cancer. Plus you've got all this other which says carcinoma. We want to do a bronchoscopy because we suspect lung cancer. So lung cancer is very strongly in contention.

Q Well, when the pathologists -- Dr. Giorno was the pathologist at Mercy Hospital that looked at the tissue taken through the thorascope. He looked at it and he concluded what, that it was mesothelioma?

A He looked at it through the thorascope?

Q No, he looked at the tissue that was taken.

A Oh, okay. That's a different statement.

Q During the thoracoscopy, and he decided it was mesothelioma; is that right?

A Well, pathologists -- the panel is there to see how valid these doctors are. If he makes that diagnosis, he makes it. I mean, we don't know the basis -- what is the evidence upon which he made the diagnosis, what criteria did he use and did he satisfy the criteria we just

displayed, did he think it was diffuse, did he think it was biphasic, did he think it was tubulopapillary, are right down the line and say how did this fit. And if you check those and find that they all favor adenocarcinoma, why would you come to a diagnosis of diffuse malignant mesothelioma? That's the surprising part. So it's opinion without evidence.

Q In other words, you disagree with what Dr. Giorno decided; right?

A Well, not by opinion. I'm presenting evidence to say here is my interpretation, here is the evidence from my interpretation. And incidentally, I have much more than evidence in my report than was on that -- on that listing. I think it's very important that these various statements that I make, you know, being mentioned by somebody somewhere down the line.

MR. METCALF: Your Honor, this my go faster if Dr. Sherwin and I could have some agreement that I'd ask questions and he would answer the ones I asked.

THE COURT: I think that's an appropriate objection.

MR. GRAVES: I think the questions are impossible, Your Honor, to answer.

THE COURT: The reason I'm saying that is there's some old law about the appropriate lawyer to make the

objection to a non-responsive answer. And the old law says it's supposed -- it's only the entitlement of the questioning examiner. But I -- I was sort of thinking maybe -- how much more time do you have?

MR. METCALF: I'm not sure, Your Honor. Maybe 30 minutes, something like that. It would be appropriate to break here. Could be a little longer.

THE WITNESS: Is there any possibility of going on because I've got a commitment this afternoon? And to hang around and lose that time is very -- it's very hard on my schedule.

THE COURT: Well, let me ask the jury. Anybody who feels we could try to finish this witness before lunch and take lunch afterwards? Is that okay?

THE WITNESS: I very much appreciate that.

Q (By Mr. Metcalf) Dr. Sherwin, what was described by Dr. Parker when he did the thorascopy in February of '87 -- March of '87 is exactly what you would expect to see mesothelioma looking like on a thoracoscopy; isn't that right?

A Well, as I quoted that February thoracoscopy in which -- let me get it out again, in which he said post-operative diagnosis probably malignant metastatic tumor, that is not what I expect to find with mesothelioma.

Q What he described in terms of the pleural -- the

nodule tumor on the pleura is exactly what you would expect to find when you look through the thorascope in somebody's chest who has mesothelioma; right?

A No. I expect to see a rind of cancer encasing the lung. That's what I would have expected to see. You wouldn't be able to see the lung. Or let's put it this way, you certainly shouldn't be able to see most of the lung.

Q Now, in this book that we referred to on asbestos-related malignancy there's an entire chapter on thorascopy; isn't that right?

A Well, I don't know. I don't memorize the contents. But I'm sure that they've gone into exploration.

Q Let's take a look at what these physicians say about what you expect to see on thorascopy. Looking at page 306, in 57 of the 62 patients that gross pattern of tumor involvement was consisted of nodules and masses that were malignant pleural thickenings or frequently both. So here you've got almost 90 percent of the ones they look at. This tumor was nodular on thorascopy; right?

A Well, that's what they say. But of course that's not -- that's a typical picture for metastatic carcinoma. I can't tell you what the clinicians are basing this on. That's their statement. That's what they claim. But remember, we're including a lot of diagnoses in of

mesothelioma, at least 50 percent of the diagnoses of mesothelioma if you go by the pages are erroneous. So you have to say that probably half of these are -- are not mesotheliomas to begin with because they weren't validated. So I can't -- all I can tell you is when you have nodules you're talking carcinoma. When you have sheets you're talking mesothelioma. For them to say that is misleading, there's a lot of misleading literature.

Q Okay. Now, you go on to say that nodules and masses observed in a total of 40 patients were small, 1 to 5 millimeters in diameter. Approximately one-fifth of the cases form a collection of small granulations represent early stage in mesothelioma, and the remaining four-fifths of the cases the nodules were larger than 5 millimeters in diameter. So again, they're talking about a picture that looks just like this, aren't they?

A Well, I -- I can't read into their minds, but it sounds to me like as though most of what they're talking about is metastatic carcinoma.

Q Well, they talk about that, don't they? They say the grand amount, 3 percent of cancers to the pleura of metastatic to the pleura have a similar appearance, 3 percent. Isn't that what they say there?

A Well, I can read that just the same way you read it. But can't we go back to what the surgeon himself said.

He thought it was metastatic. And why do we want to look at somebody else's general treatment. Here is a specific case. The surgeon said he thinks it's metastatic. I agree with him.

Q Well, the surgeon said he was going to wait for the pathology report and decide what kind of cancer Mr. Richie had, didn't he?

A From the standpoint of the final diagnosis. But in terms of what you just said, what does a surgeon see when he looks into that chest, the surgeon said I saw metastatic cancer. That's what he said. And that's all I can go by.

Q You don't want to go by what the surgeon said in March of '87 where he said grossly, this would be consistent with mesothelioma?

A I don't know why he made that --

Q Should we throw that one away?

A What's the basis for his saying that?

Q What's the basis for -- in February for his saying that it's got to --

A Oh, no. When somebody says I think my operative diagnosis is metastatic cancer, that's a strong diagnosis. If he said later on something, a plaque is consistent with mesothelioma, that's a very weak statement, you know, having -- I won't go into analogies, but consistent is very

weak as opposed to a surgeon saying within a reasonable degree of medical certainty, this is metastatic disease. And I think that's what counts.

Q Um-hum.

A It's far more significant than somebody you see consistent with mesothelioma carries with it a lot of things that happen. Since all I can tell you is this case says he thought it was metastatic. And that is not the only finding. Remember that we have a lot of other findings to suggest that this is in fact a lung cancer.

Q The surgeon sent the tissue down to the pathology department for a reason, didn't he?

A Is that a real question?

Q That's a real question.

A They're obligated -- the surgeon can't make a diagnosis of mesothelioma or any other cancer. That's what pathologists do. He is -- he is bound to depend upon the pathologist, which is the problem we're running into. The clinicians are on one track and the pathologists are on another track. Who is right?

Q Now, the next page in that book talking about what looks like thoracoscopy, has some more pictures of pictures through the thorascope; right? And they point -- they have a picture, for example, of grapelike nodules on the parietal pleura. Again, that's exactly what was

described in Mr. Richie's thorascope, isn't it?

A I didn't see the word grapelike nodules. But I don't know how his findings compared to that. The surgeon will tell you, not me. I wasn't there.

Q In any event, what is described in Anton and Eisner about the thoracoscopy appearance of mesothelioma being nodular masses, you would disagree with that as describing mesothelioma; is that correct?

A Well, it's not my disagreement. That's the way it was born. If you look at Dr. McCoy's own statement he said nodules favor carcinoma, sheets favor mesothelioma. We're not talking about absolutes. We're saying if you find nodules, which way do you turn. And I say you turn towards carcinoma.

Q You've never --

A It's just one of my criteria.

Q You've never had the opportunity to look through a thorascope at a mesothelioma, have you?

A At one time probably. I can't -- not in recent recollection. I've gone up to the operating room at times. I've been a part of surgery. They have asked me to look at things. But I can't specifically say that I've seen enough of them.

Q Now, mesothelioma can also appear even at a late stage as a large bulking mass in the lung; isn't that true?

A Anything is possible. We're, again, not trying to make absolutes. Anything can happen. You can have nodules. They are described. All I'm trying to say is what gives you a high level of confidence -- I think all of this is coming down to one simple thing, what does it favor and how does it fit in with everything else. That's all we're asking.

Q Dr. Hammar describes early mesothelioma being nodular. Dr. Churg describes it as being nodular. Dr. Corson describes early mesothelioma as being nodular. All of them are on the US Canadian Mesothelioma Panel; is that right?

A Yeah. Dr. McCoy has a photograph in which he claims there's an early stage. You can add that to it.

Q Dr. McCoy?

A Dr. McCoy. So I'm aware of these, but they're all early stages. And if somebody were to ask you to pick up an early stage of something as opposed to what you've got right now, if you don't fulfill that criterion --

Q Does a fetus at an early stage of pregnancy, post two weeks conception look like a fetus eight and a half months? I mean, they look totally different, don't they?

A Well, you can turn it around. You can't tell the difference between a cat and a dog and human or anything else in these early stages of development. That is very

similar. So but there's no -- yes. I don't think there's any real relationship to that. I mean, you're simply trying to tie in something. Cancer is not pregnancy.

Q You have to do some other tests, don't you, to find out what you've got?

A Well, you have to put them all together. You have to do a lot of things.

Q Now, you would agree --

A Tests and observations.

Q You would agree, wouldn't you, Doctor, that metastatic disease is not evidence for or against the diagnosis of mesothelioma. Is that true?

A You're not supposed to have metastasis. If you've got Dr. Churg's book you see extensive metastasis, which is an argument against mesothelioma. That's Dr. Churg's word. You'll find it somewhere in there. So what does that tell you? It tells you that you're not supposed to get metastasis, but anything is possible. So am I going to deny -- I already acknowledge that I had accepted some cases with metastasis, but I can tell you not in a high level of confidence.

Q Well, metastases are found in approximately half the cases of mesothelioma; right?

A Not extensive. Read his book; right? The finding of extensive metastases is an argument against

mesothelioma.

Q Okay. Let's just see what it says. In the past it was thought that mesothelioma did not metastasize?

A That's right.

Q That's in the past?

A In the past. And little by little the example has gotten into that until a little bit of metastasis was accepted and a lot more and so forth. But now too much is being accepted.

Q More -- but more recent studies have shown metastases are present in about half the cases that are examined at autopsy. Thoracic or abdominal cavity lymph nodes are the sites most frequently involved; pleural tumors less often metastasize to superclavicular or cervical nodes. We're getting there, doctor.

A I want you to read that line.

Q It's very common for pleural tumors to metastasize to one or both lungs. Tumor is also fairly frequently found in heart, bone, liver, and adrenals. Elmes and Simpson claim that epithelial tumors are more likely to have distant metastases.

Mr. Richie had epithelial tumor, didn't he?

A That's correct.

Q Epithelial is of least confident of the group. Whereas Law et al. claim that metastases are most frequent

with saarcomatous tumors. As a rule, metastases are not clinically significant, and presentation with extensnive metastatic disease is against the diagnosis of mesothelioma.

A Let's read that again. As a rule, metastases are not clinically significant. He's got highly clinically significant metastasis.

Q Well, Mr. Richie showed up in the hospital because he had chest problems; right?

A I don't know what you're saying. All it says is an extensive metastasis argues against the diagnosis. That's what he's saying. Now, I don't go along with that frequency. I think if you went into validation or said let's go through literature you would find that it's not so frequent as they say when you talk about confidence levels. But in any event, I don't use it as an absolute. All we're saying is if you've got metastasis it's an argument against it. That's all we say.

Q All right.

A You don't -- you're going to use -- you want to use the metastasis for that purpose. Dr. Churg doesn't necessarily want to do that.

Q Okay. Well, he said extensive metastasis and clinically significant metastasis is an argument against mesothelioma. Mr. Richie --

A Has both.

Q -- has some evidence of metastases of something, although it was never confirmed to be a metastases in the femur and on the ribs; right?

A Bilateral of the lung, at least two nodules in the lung, one of which -- or both of which may be metastatic, one of which may be primary according to one of the notes. So we're talking about clinically significant metastases. And again, the important thing is those are the hallmarks of carcinoma. You don't use that to support mesothelioma. Whichever side of the fence you're going on, it's got to be carcinoma.

Q And were you advised in this case that Dr. Hammar and Dr. Abraham both testified that if what Mr. Richie had are metastases, it was of no significance in making the diagnosis of mesothelioma?

A I have no interpretation of their report.

Q Now, epithelial mesothelioma that's what Mr. Richie had; right?

A Yes, that's correct.

Q Okay. And the epithelial mesotheliomas are usually about 50 percent of all mesotheliomas; right?

A Maybe more.

Q Maybe more. So the most common presentation is an epithelial mesothelioma; right?

A That's right.

Q When you say -- when you say something that's typical; in other words, biphasic is typical, you don't mean to suggest that that means it's -- you're going to more likely see a biphasic mesothelioma?

A No. Let me paraphrase Dr. Suzuki(phonetic). While the frequency of epithelial is more common, the biphasic presentation has diagnostic value. That's all we're saying. Sure, it's more common. But the biphasic has diagnostic value. That's a quotation out of the disability compensation book.

Q Doctor, epithelial tumors can have a desmoplastic pattern; is that right?

A That's correct.

Q And epithelial mesothelioma is the cancer cells are usually cuboidal, round, or polygonal; is that correct?

A Well, they can be anything. They've been described you name it descriptions. And somebody in some book or some article has claimed they've got a mesothelioma like that. But the simple answer is does it look like normal mesothelium. The normal mesothelium is cuboidal, flattened, uniform. That is one of the criteria that was originally set up by Churg, uniform. It's an outstanding property to have uniform, cuboidal, or flattened cells.

Q That was in what, 1976?

A It was actually earlier.

Q Earlier, that's right.

Do you think maybe times have changed in the ensuing --

A No longer looks like the mesothelium anymore, no. It's still likes like --

Q People have a better understanding and appreciation about what mesothelioma does look like?

A Well, what I'm saying is if it looks like the mesothelial cell you have evidence. If it doesn't look like the mesothelial cell, where is your evidence. If it is anaplastic, for example, which this cancer is, it has no diagnostic value for mesothelial cells because they don't look like that. So we're talking about a pathologist looking through a microscope saying does it look like mesothelial lining, and the answer is it does. If it's uniform, cuboidal, or flattened, the more it deviates from that the less confident you are in using it as an argument in favor of mesothelioma. It's -- that's as simple as I can make it.

Q You wanted to talk about Dr. Case's report a minute ago?

A Well, I don't want to talk about it, but if you want to bring it up.

Q Here it is written to somebody at Tilly & Graves;

is that right?

A Yeah. I don't recall exactly what it's about. I just know that it's Dr. Case's report.

Q He's a pathologist; right?

A Yeah, he's from MaGill, as I believe.

Q He describes looking at the same slides that you just talked to us about. He said that this slide provides more evidence of tumor which appears to be growing on the surface of the lung, providing some circumstantial evidence for mesothelioma. Is that what Doctor --

A That's what he says. I saw that photograph, and it is growing on the surface of the lung, but it's a local growth. I'm surprised that he said that.

Q And Dr. Hammar also said that. Are you surprised that Dr. Hammar said that?

A That they took that photograph of lung and he said --

Q He showed us exactly the same photograph and said this is exactly what mesothelioma looks like.

A Well, I wish somebody had asked him about -- how about carcinoma.

Q Oh, somebody did ask him how about carcinoma.

A I hope he said that's the way carcinoma appears.

Q He said it's the way mesothelioma appears.

A He didn't -- he did not say carcinoma appears

that way?

Q Let's take a look at what Dr. Case says about the appearance. He said that particularly noteworthy are areas around the end of the tumor in which cells are elongated, have papillary extension of their cytoplasm. This appearance is similar to that of mesothelial cells in these areas; right?

A Well that's his opinion.

Q You disagree with that?

A Not only do I disagree with it, but the only identification I can see where it looks like something was kidney to me. It was so variable that I felt this was probably a renal carcinoma on the basis of histology all by itself, which of course I have to temper because I have to put all the criteria together. Sure, I disagree with that. That's a very limited statement. And those were not his conclusions as I understand it.

Q Well, Dr. Case's conclusion was he didn't know what it was. He couldn't say whether it was mesothelioma. He couldn't say it was cancer. He couldn't say anything. Is that what you understand?

MR. GRAVES: Your Honor, I'm going to object to this. This is speculation. Dr. Case is a witness here. He will be here on Wednesday to tell us all about this. I think to go through lugubrious detail of his report --

THE COURT: He said he relied on it in forming his opinion, did he not?

THE WITNESS: No.

THE COURT: Objection overruled.

Q (By Mr. Metcalf) Now Dr. Sherwin, is it true that the epithelial mesotheliomas are composed of cuboidal and polyhedral tumor cells with prominant neuclei?

A You can name any description and there's somebody who has described that. Anaplastic, polyginals, spindle, cuboidal, you name it, there's a report somewhere in literature that's claimed, including mucin production. You also find these reports. So yes, you will show me a report that says that, but that's not what they normally look like.

Q You know Dr. Victor Roggli; right?

A Yes.

Q Dr. Roggli is on the United States Canadian Mesothelioma Panel; right?

A I don't know that. He may be. He may not be.

Q Well Dr. Hammar when he testified told us that Dr. Roggli is on the panel.

A Well, then that's true. I'm not sure about that.

Q In any event, you recognize Dr. Roggli as being somebody who has written extensively about mesothelioma and other asbestos-related diseases?

A Yes.
Q Is that correct?
A Yes.
Q This is -- you're familiar, of course, with his book; right, Pathology of Asbestos Associated Diseases?
A I can't quote you things from it.
Q Well, under histopathology doesn't he say that the most common is the epithelial pattern, which we've agreed on; is that right?
A Yes.
Q Which is composed of cuboidal or polyhedral tumor cells with central neuclei and often prominent neuclei; is that right?
A That's fine. I have no problem except for one thing. And that is, again, remember the most common epithelial is not the same as the one with the diagnostic value. You have to -- you have to interpret those statements. And you also mentioned cuboidal. How many are polyhedral I don't know. But cuboidal -- he certainly recognized cuboidal because that's the way the mesothelial cells look.
Q You feel that the most helpful pattern diagnostically is when it's tubulopapillary; is that right?
A The pattern that has diagnostic value is tubulopapillary, yes. If you notice, I put it together

with the cytology, tubulopapillary with uniform cuboidal cells or flattened.

Q Now, when you in fact come across a mesothelioma you've been asked to look at by a defense lawyer and it is tubulopapillary, you then discount that and say well tubulopapillary is consistent with all kinds of cancer?

A No, I don't discount it. I have an arrow, and I'm trying to adjust the arrow in saying how do I use it.

Q Well here is --

A Tubulopapillary -- there are lung carcinoma -- I published papers on tubulopapillary carcinoma of the lung. The comment is tubulopapillary cancers are thyroid, pancrease, kidney, lung. There's no question about that. But I don't discount it. Everything I'm doing is an arrow. Which way does it point if I get tubulopapillary? It may not help.

Q In November of 1986 you reported to a lawfirm in New Orleans, you wrote this court report. In there you said thirdly, microscopic findings show epithelial cancer which has metastasized to a lymph node that has tubulopapillary appearance is consistent with different kinds of cancer; is that correct?

A Absolutely correct. That is a sound scientific statement. But however it's being used to say that if two cancers can produce the same thing, for example, you

already mentioned encasement. Lung cancer can encase the lung. When you find that you have to worry about lung cancer, doesn't say I discount. It I says it doesn't help me, ordinarily it would favor mesothelioma. And so I have to say in this case if we find these things I have to weigh it with everything else.

Q Now, biphasic cancer would be one that's a combination of epithelial and spindle cells; right?

A Sarcomatous, correct.

Q Sarcomatous cells are spindle shaped; correct?

A Well, there's spindle epithelial cells that's -- I didn't said that a true biphasic cancer is sarcoma which means it's coming from connective tissue which happens to be spindle. But there are epithelial cells which are spindle. They're called spindle cell carcinoma.

Q Now, in this case the immunohistochemistry done at Dr. Taylor's lab determined that the cancer would be consistent with mesenchymal tumor; is that right?

A That was Dr. Barr's opinion, correct.

Q Is mesenchymal a sarcomatous cancer?

A That by definition is carcinoma.

Q So we have epithelial. Dr. Barr says sarcomatous or mesenchymal.

Q In Mr. Richie's case. But you're discounting or don't really consider the immunohistochemistry done at USC;

is that right?

A Well, they based that on, as I understand it, on vimentin positively. And epithelial cells co-express vimentin and keratin. When she says consistent when she probably also said in the report that epithelial cells can also produce vimentin. But the point is she herself -- I have to -- I have to take that report just as a blood test from the lab and say does it fit with everything else. Basically that was a non-contributory.

Incidentally, I didn't get Dr. Case's report until after my -- only recently. I did not rely upon that for any information for any interpretation. It was mentioned that I relied upon it, but that's not true.

Q Now it's true, isn't it, sir, that most adenocarcinomas are positive when tested for neutromucin?

A No. 99.9 percent of renal carcinomas are negative for neutromucin.

Q Let's talk about lung cancer. I thought you told us before that it could be kidney cancer but you favored lung cancer, but you didn't know.

A Some 20 to 40 percent or more of lung carcinomas are mucin negative. That statistic doesn't help. The people can't be given statistical diagnosis. So I can't answer that question. Mucin may or may not be positive. It's one of those things where if it's positive it tells

you it's not a mesothelioma. If it's negative it doesn't really help you. That's why we say non-contributory.

Q It was negative in Mr. Richie's case?

A It was negative, correct.

Q Now, Mr. Richie's tumor was vimentin positive; is that right?

A I'd have to go to the report to tell you. I only go to that report for their interpretation. I don't try to enumerate or second guess them. I don't try to do that.

Q Well, Dr. Hammar said it was vimentin positive; right?

A Doctor --

Q Dr. Barr said it was vimentin positive?

A I accept that. I don't want to go -- to be put in a position going through all these tests since I don't incorporate them in my correlation.

Q I think you told us that Mr. Richie's tumor was keratin positive right?

A Pan keratin positive. And also Dr. Abraham, Dr. Hammar, and who knows who else has done this and found keratin. Yes, keratin was identified.

Q And it was -- Mr. Richie's tumor was CEA negative; right?

A I believe so, but I -- I don't like the idea of not having the report in front of me going through them.

And I don't see the point of doing that since I draw no conclusions on those.

Q We've already had testimony from Dr. Giorno, Dr. Hammar, Dr. Abraham that it was CEA negative.

A Yeah, and Dr. Barr herself had a deposition which I read last night.

Q And isn't it true that when you have a combination of positive keratin, positive vimentin, and negative CEA you can be assured that we're dealing with a mesothelioma?

A Oh, my goodness. I can't imagine anybody making that -- I never make the statement under any circumstances.

Q Isn't that the typical finding -- excuse me, isn't that the typical finding of mesothelioma?

A Well, let me just simply say there are two answers to that. Number one says you're asking me to be an expert in this area, and I've already acknowledged to you I don't have expertise, so you really shouldn't be asking me that question. The second thing says sure, I'm conversing, but I don't want to get into it.

Q If a person who had expertise in immunohistochemistry like Dr. Hammar testified if you have vimentin positive and keratin positive and CEA negative, which is what you'd expect to find in a mesothelioma, you would have no basis to disagree with that because you're

not an expert in immunohistochemistry?

A I have no comment on it. I wouldn't agree or disagree. I just defer to my own laboratory because I work with them.

Q Here is a chart. And I suppose I know your answer to this, but what this does is it -- it lists the tests done in Mr. Richie's keratin stain, CEA, LeuM1, B72.3, BerEP4, HMFG. Can you tell us, as Dr. Hammar did, what percent positively you would expect to see for carcinoma and for mesothelioma in these? Do you have any idea?

A Well, I don't like to give an answer to a question where I'm not an expert in the area where I'm not conversing with all the literature. And so as an expert you really shouldn't ask me that question.

Now, the second question -- I mean, second approach to that would say if those were such great gold standards why are we struggling so hard to come up with all these new ones like an anti-mesothelial antibody. How about -- BerP4 was recently introduced when theoretically LeuM1 was such a great gold standard. This is all in a state of flux. And to single out those I think is really not appropriate from my standpoint.

Q Aren't these the ones that have a value in helping diagnose mesothelioma to people who are experts in

this area?

A They're a fraction of what I do. I do 25 of them.

Q But you did a lot of them. You didn't do any actually, did you?

A Well, I mean, I requested 25. That's absolutely correct. I requested 25.

Q You know Dr. Shebani and Dr. Battifora, don't you?

A I have met both of them.

Q They're practicing in Los Angeles; is that right?

A Yes.

Q City of Hope Cancer Research Institute?

A Well, Dr. Shebani recently moved.

Q Dr. Battafora is an expert in immunohistochemistry; is that right?

A I accept that, yes.

Q He's on the United States Canadian Mesothelioma Panel; is that right?

A Yes.

Q He's written extensively on the use of immunohistochemistry for helping diagnose mesothelioma, hasn't he?

A That's correct.

Q You've probably seen this article by Shebani and

Battifora; right?

A Yes, I have. This is 1986. And that's subsequent -- there are several articles subsequent to this. That's almost out of date.

Q So '86 would be out of date in your view?

A Well, this field is changing radically, yes. Well, as a none expert I would -- I would not rely upon that. I'd get his later one.

Q Well, let's see what he says here. On HMFG, which was done in this case, 96 percent of adenocarcinomas were positive and zero percent of mesotheliomas were positive; right? Is that what it says here?

A Well, I can read that and listen to you and acknowledge it, but I can't comment on it as an expert. And I would also say that I don't understand what you're doing in 1986 when so much literature has come to pass since then, a lot of experience with all of these since 1986.

Q Did you bring anything with you that would indicate that what he reported in '86 is wrong?

A Well, I actually do have articles. But I can't go into it because it would put me in the position of being a none expert critiquing the experts, and I don't want to do that. But it's -- but there's a very basic fact, Dr. Shebani has published recent articles in 1991 and 1992

that encompasses all of these, including one that's an update that brings you up to date on all of these, including his recent events which I'm sure I have with me. If you want the citation, I'll put it out.

Q Well, if you have the article I'd be happy to look at it.

A I'm not going to comment on it because I would have to be an expert to do it. If you want me to do it I will do it.

Q The point, Dr. Sherwin, of this really is, isn't it, that these various tests are recognized as having value in discriminating between adenocarcinomas and mesotheliomas; isn't that right?

A It means that I'm using them because they may have some value. But let me emphasize they are ancillary tests. And if you look at McCoy's articles on US Canadian Panel experience, you'll see in there says ancillary tests. That's what these are.

Q That article is 19 --

A 1991. I don't remember the exact citation.

Q That's right.

A These are ancillary tests, and I do them as ancillary tests. They're still exploratory. We're still searching for the gold standard. And I still turn to Dr. Taylor and his department for interpretation, and I

expect them to be keeping up with that.

Q Okay, good. Are you having any success in finding that article?

A Well, I have a lot of papers in here. So let me just let me go through and see if we can find that.

MR. GRAVES: Your Honor, I'd object to the procedure. I don't think there's a question pending on it unless Mr. Metcalf is going to insist that he go through --

THE WITNESS: Well, the article by Shebani which is an update -- I'd rather go on with the deposition and try to find it while you're talking.

THE COURT: I don't know what to do. I never had this problem before.

MR. METCALF: Apparently haven't had Dr. Sherwin in court before.

THE WITNESS: Well, I don't mind helping you.

THE COURT: Do you have any other questions?

Q (By Mr. Metcalf) Dr. Sherwin, have you got any familiarity with the B72.3 test?

A Well, personally in terms of expertise, no; in terms of use, yes. For a long time we used B72.3, and it turned out, according to Dr. Taylor, to be very unreliable in his laboratory hands. And because it was unreliable he came up to me one day and said we're going to discontinue it. And I said fine. It came off his list. I couldn't

even check it anymore because it was no longer available I don't think. So we don't do B72.3.

Q Other laboratories, however, may have different experience with it and have been able to find it very useful; isn't that right?

A Well, may very well be. That's the kind of question that you might ask Dr. Barr or Dr. Taylor.

MR. METCALF: Well, rather than wait on the article, I'm going to not ask anymore questions.

THE WITNESS: Okay.

THE COURT: Redirect?

THE WITNESS: I'll try to find it after you get through here.

MR. GRAVES: I have only two questions.

REDIRECT EXAMINATION

BY MR. GRAVES:

Q Dr. Sherwin, you've testified that you made use of Dr. Barr's expertise and Dr. Taylor expertise with respect to immunohistochemistry; is that correct?

A That's correct.

Q When counsel asked you about the combination of positive for keratin, vimentin, and negative for CEA, was that strongly suggestive and diagnostic of mesothelioma. Do you remember that question?

A Yes.

Q Do you remember Dr. Barr's answer to that question when it was propounded to her in the deposition?

A Well, I can't recall it, but --

Q Directing your attention to page 39, did she give a response?

A Well, there is a -- let's see, whether that combination of staining was present in Mr. Richie's case. Yes, I do have an opinion.

Q Would you read that paragraph, please, upon which --

A It says basically what Dr. Churg is referring to is that the same malignant cell will express both keratin and vimentin. That's called co-expression of antigens, which I mentioned. And in this case when we stained the initial panel of antibodies we stained the same piece of tissue with keratin and vimentin. And all the epithelial markers were negative. Vimentin was solely positive and strongly. So there have been no reports in literature of mesotheliomas being negative for keratin.

Q Right. Is that the physician you relied upon?

A I simply relied upon her interpretation. I didn't put a lot of weight on it, no significant weight on it. She simply concluded -- favored carcinoma. That's fine. It goes along with what I believe.

Q And Doctor, finally with respect to the discharge

statement that counsel mentioned to you, this is in May of 1987, do you recall reviewing this, sir?

A Yes, I do.

Q Was there a comment about the prostatic carcinoma?

A Yes, in June of 1983. I also should mention I didn't -- I'm glad you raised this. Very top paragraph says that he was given tetracycline that first operation, if I recall correctly. So I want you to know that some scarring of the pleura after that first operation could have been due to the tetracycline. But yes, prostatic carcinoma in January of 1983.

Q All right. Now, did he make a comment; that is, Dr. Barter whom we've heard of before, did he make a comment about the bony metastases and the relationship to prostatic cancer?

A Well, let's see what he said. He said he has known bony metastases by previous bone scan, and whether this is from the mesothelioma or prostate cancer is not known.

Q That was the end, the final summary, was it not?

A Discharge diagnosis dated May 1987, date of discharge May 4, '87 and his date here is 5/7/87. Final it says underneath, final summary, correct.

MR. GRAVES: Thank you. Nothing further.

THE WITNESS: Here is that article by Shebani.

MR. METCALF: I'm not going to do it.

THE WITNESS: Well, it's -- since you asked for it. Dr. Battifora is part of the article. And there's a recent summary of LeuM1 and a flock of others.

Well, that's the -- that's one of the -- I brought along a lot of supporting evidence.

MR. METCALF: I appreciate that, Doctor. I'll take a look at it. I see the judge scowling.

THE COURT: We're going to be in recess until a quarter to 2:00.

MR. GRAVES: May Dr. Sherwin be released?

THE COURT: Dr. Sherwin may be excused.

THE WITNESS: Thank you for allowing me to --

THE COURT: Recess just a little over an hour. Remember the admonition. See you at quarter of 2:00.

(A recess was taken, and then the following proceedings occurred in the presence of the jury and on the record.)

THE COURT: Mr. Graves, your next witness.

MR. SPITALNIK: Your Honor, we'd like to call Dr. Gordon Bragg.

DR. GORDON BRAGG,

called as a witness on behalf of the defendant, having been first duly sworn, was examined and testified as follows:

THE COURT: You may be seated. Please state your name and spell it.

THE WITNESS: My last name is Bragg, B-r-a-g-g, Gordon Bragg.

DIRECT EXAMINATION

BY MR. SPITALNIK:

Q Dr. Bragg can you tell us what your profession is?

A I'm a professor of mechanical engineering at the University of Waterloo in Waterloo, Ontario, Canada.

Q Dr. Bragg, I'd like to ask you a number of questions regarding your opinions about the behavior of asbestos in the air. But before you do that I'd like you tell us a little bit about your background. Can you tell the jury what your educational background is.

A I hold a bachelors degree in mechanical engineering from the University of Toronto in Canada. I hold a Ph.D in aeronautical engineering from the University of Camebridge in England.

Q Dr. Bragg, you mentioned mechanical engineering. Can you describe to the jury what mechanical engineering is?

A That's the design and analysis of any kind of equipment that uses energy most basically.

Q And you mentioned that you obtained your Ph.D in

aeronautical engineering. Can you tell us what aeronautical engineering is?

A Most generally aeronautical engineering deals with the flow of air over any kind of object, most specifically airplanes of course, but generally flow of air over objects.

Q What specifically do you look into when you study aeronautical engineering?

A You look at air flow, how they interact with solid bodies, how the forces between the surfaces and the air interact.

Q And you mentioned that you obtained your Ph.D in aeronautical engineering. Can you tell us what's involved in obtaining your Ph.D in that field.

Q In that area you do a piece of research typically for about three years. You present a dissertation and defend it against other experts. And that successful defense entitles you to your Ph.D.

Q Did you have successful defense of your dissertation?

A Yes, I did.

Q Now, you mentioned initially that you were a professor at the University of Waterloo. Can you tell me how long have you been a full professor at the University of Waterloo.

A Since 1979.

Q Have you held other positions at the University of Waterloo?

A I arrived there immediately after completing my Ph.D in 1965. And I was successful as an assistant professor and associate professor, and in 1979 was promoted full professor.

Q Can you describe to the jury what the University of Waterloo is and tell us a little bit about its engineering facilities.

A University of Waterloo is a relatively new university. We have the largest engineering school in Canada. We have the largest graduate program in engineering in Canada. We have the largest research funding both from government and from private sources in the engineering field in Canada.

Q As a full professor of mechanical engineering at the University of Waterloo what are your responsibilities?

A I teach both ungraduate and graduate programs, I lecture and supervise graduate students, I do research myself, and I supervise research by graduate students. And I do a small amount of administrative work.

Q Apart from serving as full professor at the University of Waterloo have you ever had any visiting professorships at other educational facilities?

A I've been a visiting professor at the University of Calgary in Alberta, Canada some years ago.

Q And in what was that visiting professorship?

A In the field of fluid mechanics.

Q Now, you mentioned earlier that some of the work you do as a full professor of mechanical engineering at the University of Waterloo involves research. Can you tell the jury a little bit about the types of research that you've undertaken in your field of mechanical engineering.

A In recent years all of my work has been in the field of air pollution and air pollution controls and analysis of particulates in air. And also most recently a considerable amount of my work has been devoted to the question of asbestos in the air, how it gets there, how it gets removed, what happens to it in the air.

Q Have you written any papers on this particular topic?

A On that topic I have written approximately 25 papers in the area.

Q Have you written papers on other topics involving mechanical engineering?

A I've done research papers. I've written about 50 of them. As I said, about half of them are on the subject of asbestos.

Q Are those papers peer review papers?

A Yes. They're anonymously reviewed and accepted in peer review journals.

Q When you say they're anonymously reviewed, can you tell the jury a little bit about the peer review process and why that's significant in your field.

A In the scientific area it's important that any piece of research be judged, and it be judged independently and only those papers which have survived this review process should enter the scien -- the formal scientific literature.

Q You discussed that some of these papers dealt with what happens to asbestos in the air, how much is in the air, and how it leaves the air. What do you base those papers on? Is it just pure research? Are there other avenues that you explore?

A Some of my work has been in the laboratory where we study asbestos and how it gets in the air and how it leaves the air. We've studied in laboratories the various measurement methods, some of the various measurement methods used to measure asbestos, and also on the basis of a wide range of field studies in natural locations where asbestos is present. Supervised a lot of measurements in the factory air in buildings, in environments of that nature.

Q And what type of field studies have you

undertaken into these different facilities?

A Measurement of asbestos levels, kinds of methodology for measurements of asbestos levels, sources of asbestos, and by the levels what they are, studies of that nature.

Q In conjunction with your research papers on this topic approximately how many different industrial facilities did you conduct field studies at?

A Well, if you include all the various field studies I've done and not just the ones that have been sources of research papers, probably several hundred.

Q Now Dr. Bragg, apart from your position as a full university professor, have you held any other positions historically which involve asbestos and buildings?

A Yes. I've done contract research for the province of Ontario Ministry of Health, Administrator of Labor, I have done specialized studies for a Royal Commission in the province of Ontario which would be similar in the United States to a presidential commission, and I have also done studies on behalf of organizations that appeared in front of OSHA; that is, in the United States the Occupational Safety and Health Administration and in front of the Environmental Protection Agency.

Q Now, you mentioned the position as consultant with the Ontario Ministry of Health. When was that?

A That would be approximately 1969 or '70, somewhere in that area.

Q Can you describe for the jury what that position involved.

A At that time I was doing research on the control of asbestos dust on behalf of the government of Ontario. And in the middle of that period I became involved as a consultant and an inspector going into the asbestos using facilities in the various factories in the province assessing the levels there, determining how to measure them, providing advice to the people there on how to control and minimize asbestos dust levels at the environment where they were using asbestos or using asbestos as part of their products.

Q And approximately how many industrial facilities did you visit while you were involved with the Ontario Ministry of Health?

A Somewhere between 50 and 100 at that time.

Q Dr. Bragg, I believe you also mentioned that previously you were involved with the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario. Can you tell the jury a little bit about that position and what it involved.

A I was one of ten specialists engaged by the Commission to provide specialized studies for them. The

particular area in which I was asked to provide information was on the ability to control asbestos dust and the levels that could be achieved by those various controls, and also the costs of implementing those controls.

Q Did this Royal Commission generate any type of written report as a result of your findings?

A Yes, they published my own study as a specialized book and also they produced a multi-volume analysis of the whole question of asbestos in all environments at that time in the province of Ontario.

Q Dr. Bragg, we've talked about the Ontario Ministry of the Health and the Royal Commission as bodies that you consulted for previously. Are you currently involved in any other consulting activities that involve asbestos in buildings?

A From time to time I provide written documentation for engineering control of asbestos dust on behalf of an organization entitled the Asbestos Institute. And I give courses on their behalf to engineers on the control of asbestos dust in the industrial environment at various locations around the world.

Q And can you tell us what the Asbestos Institute is?

A Asbestos Institute is an organization created and funded by the Canadian government, by the government of the

province of Quebec, by the manufacturers in Canada who both mine and manufacturer asbestos, and by the unions who work in those industries. And the objective of the -- of the organization is to promote safety in the use of asbestos.

MR. SPITALNIK: Your Honor, may I approach the witness?

THE COURT: You may.

Q (By Mr. Spitalnik) Dr. Bragg, I'm handing you what's been marked as OCF Exhibit 457a. Is that a current copy of your curriculum vitae?

A Yes, it is.

MR. SPITALNIK: I move to have this admitted.

MR. METCALF: Objection. It's redundant.

THE COURT: It's admitted.

Q (By Mr. Spitalnik) Dr. Bragg, are you also involved in legal issues involving asbestos?

A Yes. I've appeared before OSHA on behalf of the Asbestos Information Association of North America with respect to the OSHA proposal sometime ago to lower the permissible exposure levels. Also I've provided testimony to the Environmental Protection Agency of the United States on behalf of the industry with respect to their proposal to phase out and ban asbestos, which was proposed some years ago now.

Q Are you also involved with lawyers consulting on

cases such as this one?

A From time to time in Canada and the -- and the United States I'm asked to provide testimony before courts.

Q In that capacity have you been retained by my firm to discuss how asbestos fibers behave at the Gates facility here in Denver?

A Yes.

Q And are you compensated for that by our firm?

A Yes, I am.

Q And have you reached opinions in this regard with respect to how asbestos fibers behave at Gates facility here in Denver?

A Yes.

Q And are those opinions based upon generally accepted scientific principles regarding how asbestos acts in the air?

A Yes, they are.

Q Well, can you tell the jury a little bit about the basic scientific mechanisms which impact upon asbestos fibers in the air and what they are?

A It's useful when thinking about asbestos, especially asbestos in the air, to group what we call mechanisms into three different processes. The first one is to discuss how asbestos gets from a solid object and in a solid form into the air. The second thing that is

helpful for understanding is to discuss what happens to it while it's in the air. And the third thing that is useful is to discuss the mechanisms by which it leaves the air. And if we look at each of those separately and break them down, then the result will explain why the levels that we find in the air are what they are.

Q Well Dr. Bragg, you mentioned these three different mechanisms. Let me address the first one you stated, how do fibers get from a solid into the air. Where else would asbestos fibers be if they're not in the air to begin with?

A Asbestos is a naturally occurring mineral that occurs everywhere. It's in most soils certainly in North America, it's in thousands of products; brake shoes, piping insulation, and it is present in many, many different forms in places where it's in solid form; that is, not in the airborne form.

Q Well, you talk about asbestos being in solid form in a product. Is there a term of art which is used to describe what that solid form is?

A Asbestos as it's used in making products is almost invariably in the form of what we call a matrix; that is, just a mixture of two different kinds of solids. It's different from a solution not totally mixed. They're mechanically bound together. That matrix is the form in

which we find asbestos in building products, in insulation, in brake shoes, and things like that.

Q Well, let's talk specifically about asbestos-containing insulation. Does that have a matrix in it?

A Asbestos-containing insulation is in a matrix form.

Q And can you tell the jury how a fiber would get out of this matrix of the asbestos insulation into the air?

A There -- how things get in the air is again best broken up into a process in order so that we can see what happens. And it's helpful to discuss, first of all, how you get a fiber or a particle of asbestos out of the matrix. That has to happen first. That happens by a grinding or a milling or a breaking up process. The broad term for which is comminution, but it means milling or breaking up.

If that should occur and if it should occur in sizes that are of importance to us, it then is necessary to get that created fiber away from a solid surface. For small fibers of interest to us the biological significance is a much different process than the usual understanding of large particles.

The third thing that has to happen is that the particle has to be moved in the air to an area where it

might be breathed or emitted from the building or moved elsewhere. So there's the creation of the particle, the comminution, the removal from the solid surface, and dispersion through the air.

Q You mentioned a little bit about the comminution, of the breaking up.

A The overcoming adhesion is a process that's very different for a small particle; that is, one that you can't see, than it is for a large particle. And what happens is that various forms of electrostatic attraction become very important.

The situation you have one is familiar with is dust on your car. The dust particles on your car are large enough to see. That makes them many, many times larger than anything we can possibly breathe. And you know that your car dust doesn't come off if you drive on a bumpy road. It doesn't come off if you drive fast. It doesn't even come off in the -- in the rain.

The particles that are of interest that might be breathed are many times smaller than that, and the adhesion forces are many, many, many times larger than that. So that what overcomes these adhesive forces is considerably larger and worth more consideration than say sand grains or pieces of sugar on a table. These are -- what happens -- what's happening there is quite different.

Q Dr. Bragg, you mentioned a number of things, and I'd like to first ask you about the fibers. You mentioned the size is of importance. What do you mean by the size is of importance?

A Well, there's a number of ways you can look at fiber size. The usual terminology is to talk about a micron, which is a millionth of a meter. To give you a flavor for that, the smallest particle you can see in a beam of sunlight in darkened room is probably something of the order of about 25 microns. Very fine human air might be 100 to 150 microns. The largest object that is generally considered inhalable is about 5 or 10 microns; so that, if you can see it as an individual particle it's not inhalable.

Question of inhalability of asbestos is a little more complicated because some of the longer ones even though they are long can be breathed by virtue of them being very narrow. So the inhalability of asbestos is very rather more complex. But it's good to think of if you can see it, it's not inhalable.

Q Well Dr. Bragg, does the size of the fiber relate to the energy required for comminution?

A Yes. It's also a very important factor in size when you break it up or grind it, it's very -- fairly easy to create large particles it's very difficult to create

small. And particularly the amount of energy that's required to create very fine particles is considerably larger. That's why it takes time to mill flour, to grind up cosmetic powders and things of this nature is it takes a lot of energy to create small particles. So that simply the creation of large particles doesn't imply necessarily measurable levels of small ones.

Q Is the size of a particle important when you're looking at these adhesion sources that you referenced earlier?

A Very much so. Again, the smaller you go the stronger the effective adhesion forces are. And again, the best example is if you turn a table upside down with sugar on it, they will of course leave. But the finer dust even that you can see by eye will not necessarily leave the table when you turn it upside down. And asbestos particles that are of interest are much much smaller than any of the particles that you can see.

Q Now, we talked about comminution as a method of releasing fibers from the matrix of asbestos-containing insulation. Can you give the jury practical example of how that comminution would take place in an industrial setting.

A Well, the process would certainly be created -- we would go -- in comminution we would have the overcoming of adhesion certainly. An example is like if we sawed or

sanded the material, that would certainly give us the individual particles. And with the sandpaper and with the individual teeth on the saw, that focused force that you need to overcome those comminution and adhesion forces. It can certainly be done.

Q Would the mode or method of sawing impact the fiber release?

A Certainly. For example, simply wetting the product before it's sawed and if it's kept wet would eliminate the overcoming of adhesion that you would break it up, you would comminute it certainly. But it would stay inside the water. That would be an example of a very different type of solid.

Q Dr. Bragg, once you have this comminution going on, how long after the comminution will fibers continue to be released from a matrix?

A You need that disturbance of the surface that causes comminution, and you need that focused force that caused the overcoming of adhesion before you'll get a release. What that means is the minute you stop doing that, for example, sawing, you stop getting a -- really a release.

Q Well, we've talked about sawing. Can you tell us whether vibrations can cause release of fibers from the matrix.

A Everyone is aware, of course, that vibration can cause the release of individual particulates given strong enough vibrations and extreme enough vibrations. You can certainly get that. What vibration in any normal environment cannot do is provide that focusing that causes the comminution and cause the overcoming of adhesion forces.

Q So in this case are you making a distinction between respirable fibers and non-respirable fibers?

A Very much so, because the whole point is -- is that the large ones we can see, of course vibration can take very loose material and cause it to break up. It's quite a different story with the small material of the sizes that are picked up on the usual sampling in appropriate industrial hygiene sampling techniques in the respirable sizes.

Q Well, can you tell us about air flow over uncaged insulation? Is that sufficient to cause fibers to be released from the matrix?

A Air flow in any normal environment up to very high velocities will certainly not cause any grinding up or comminution, but it will also not cause an overcoming of these adhesive forces for the small particulate sorts of -- for the small respirable size fibers. This, again, is contrary to the normal understanding from things you can

see because of course you -- you can blow visible dust off solid surfaces.

Q Well certainly, Dr. Bragg, if we have damaged insulation or ripped insulation, wouldn't air flow over that damaged or ripped insulation be sufficient to cause a release of respirable fibers?

A Most definitely not.

Q And how do you explain that, Doctor?

A Again, first of all, this is -- this has been tested experimentally. We've done tests in my lab, and many others have looked at air flows over not only normal surfaces but damaged surfaces, surfaces with despoited dust and so on. And the small particles that are of interest to us because of potential for being inhaled are not released. And that's true even if the material has been previously damaged.

This again is contrary to the normal understanding of the larger particles. It's contrary to our understanding of things like sand storms and so on. These particles are small and they're held on very, very strongly. And there's a lot of experimental evidence for that. It's been tried by many, many people.

Q Well Dr. Bragg, if you're dealing with such small particles, how can you conduct experiments which are going to give you any indication of whether the forces of

adhesion are overcome?

A Well, one of the experiments we did is we took an environment of very heavy asbestos-filled air, very dusty environment that we created in the laboratory. And we let the particulates settle out on a small piece of aluminum. We looked at it under a scanning electron microscope which allows us -- it's a type of microscope that allows us to go to quite high magnifications and look at these small fibers. Then we use a compressed air hose to blow over that surface for approximately 20 minutes.

And we looked at the -- at the surface again. And the vast majority of our photographs are identical before and after. Occasionally a very large particle larger than we -- inhalable ones around 20 -- or 10 microns, 10 or 20 microns in diamater will leave, but mostly there was absolutely no change at all between before and after.

Q Dr. Bragg, we've talked about sawing as comminution. We've talked about vibrations and air flows. Can you tell me whether pipe movement -- if you have pipe which is insulated with pipe insulation, whether that movement is sufficient to release respirable fibers?

A What type of movement would you suggest? I'm -- I find your question just a little bit general.

Q Well, when equipment started up, for example, if

we have lineal pipe movement would that be sufficient to cause the release of respirable fibers?

A No, I wouldn't think so no.

Q Why is that?

A Well again, we need those focused forces. We need something that causes a grinding process if that hasn't already occurred. And even if it has previously occurred and we have particulate sitting on solid surfaces and we need some kind of focused force to move them off. And in the absence of a focused force like a saw tooth or a bit of sandpaper or something equivalent like that, we're not going to get certainly measurable quantities of the smaller dust that is of significance.

Q Dr. Bragg, when we started our discussion you mentioned three different areas, and we've talked about the first and how fibers get into the air. Can we now discuss the second, what happens to these fibers once they get in the air?

A There are two major mechanisms if asbestos gets into the air. If the small stuff that's of importance gets into the air, then we want to look at it. The first one is diffusion. And what that means is these fibers are very little, controlled by gravity. They're not to any significant level falling. They're moving basically with the air.

Q The result of?

A The result of that is they move about the natural air currents, they diffuse very quickly. What that means is that the concentration, the number of fibers in a given volume of air drops very quickly. The reason that happens is because while the number of fibers remains constant, the number of fibers per volume of air drops very quickly.

The other mechanism that happens is air in any indoor environment will leave that indoor environment very quickly. In the same way that when we talk about dilution being important, the important thing we want to talk about is the concentration, the number of fibers per unit, volume of fibers per cc is something you may have already heard about.

In the ventilation or the moving of air from indoors to outdoors and fresh air coming in, what we speak of is air changes per hour. What that means is that you want to know in an indoor environment how many volumes of air the same size as, for example, this room enter and leave this room in an hour; so that, if for example there were two air changes per hour in this room, then we're saying that an amount of air equal to the volume of this room enters and leaves here twice in an hour.

In that situation in even very tightly controlled rooms you're going to get at least two air changes per

hour. Any environment that doesn't have at least two air changes per hour will be received as very stuffy. So that amount of air is entering and leaving. The consequence for asbestos fibers of course is that that's the air that contains the asbestos.

Q Well Dr. Bragg, let's address your initial comment dealing with dispersion and dilution. Can you tell the jury how distance acts to dilute fiber concentration?

A If we say have a 1 foot by 1 foot by 1 foot box of air and somehow or another we've got ten fibers in there, we've got 10 fibers per cubic foot. If over a few moments we move out to a box 2 feet by 2 feet by 2 feet and we've got 10 fibers, we still have that but it's 8 cubic feet, 2 by 2 by 2. So as we've doubled the size we've got eight times as much air. So the concentration just in moving from the 1 cubic foot to a 2 cubic foot box has gone from 10 fibers per cubic foot to 10 fibers per 8 cubic feet. That continues on and it continues relatively quickly because there are always air currents indoors or out causing this. The affect is dispersion. The result is dilution of the concentration. And it's the concentration that's the important consideration for health for analysis of air. So the concentration is dropping very quickly.

Q Well Dr. Bragg, are you telling us then if we double the distance we don't get one-half the

concentration?

A I'm saying if you double the distance you get one-eighth of the concentration.

Q Well, let's talk --

A If you double it again you get one-eighth of the one-eighth.

Q Less talk about a practical example. We talked earlier about sawing insulation. Can you tell us how this dispersement and dilution impact on fibers released from asbestos-containing insulation while it's being sawed?

A Well, if you saw asbestos let's say with a dry saw or something of this nature, you may get in a -- let's say in a 2 foot by 2 foot by 2 foot box, that's the distance from the saw possibly to the breathing zone of the person who is doing the sawing.

Let's hypothesize that the concentration is about .5 fibers per cc as measured by the proper industrial hygiene occupational methodology. That person is going to be exposed to that level for the five minutes or two minutes or whatever that he's been exposed to. But if you now consider the concentration the instant it's stopped and let it diffuse out, you -- let's say an 8 foot by 8 foot box, you're going to get not .5 fibers per cc, but 1/64th of that on average. And that's -- I think that comes to about not one-half a cc -- or not a half a fiber per cc,

but I think .0078 fibers per cc. That is instead of .5, .007 I think.

Q Would that be the fiber concentration that someone 8 feet away from sawing would experience?

A On average.

Q Now Dr. Bragg, how can you give us this type of testimony? What data is it based upon?

A Well, it's based upon a simple reasoning process, but it's also based on an enormous amount of occupational data not only for asbestos, although it is based on asbestos measurements, thousands and thousands of them. But it's also based on -- well, it's based on my own experience in part that these levels drop off very quickly from the sources that draw in concentration due to dilution.

Q Now Dr. Bragg, you talked about the person sawing would be at a .5 fibers per cc concentration for the two or three minutes or five minutes period that he was sawing. Are you familiar with the time-weighted average concept?

A Yes, I am.

Q And how does this .5 fibers per cc relate to time-weighted average?

A In all occupational hygiene studies the proper way to test the levels, the way that regulations in the United States and everywhere else in the world are written,

is the dose is properly calculated as an eight-hour time-weighted average.

What that means is that what you want to know is what concentration that person is exposed to throughout the standard eight-hour working day. What that means is -- let's assume for the moment that -- that half a fiber per cc occurred just so we have some easy calculations for 15 minutes, and that that same person was doing other things through the rest of the day; so that, for the other seven hours and 45 minutes they weren't sawing so their exposure was zero.

The eight-hour time-weighted average since there's 32 15-minute periods in an eight-hour workday, the proper eight-hour time-weighted average for that person doing the sawing is .5 divided by 32. So it's -- I'm not sure. It's .017 or something.

Q And would you also do calculations of time-weighted average for the person 8 feet away from where the sawing was taking place?

A Yes. You'd take their value that I think it was point .00015, I think, and you get 1/32nd of that. And that would have at least two and maybe three zeros in front of it. And under those circumstances you would be at a level -- that person would be being exposed at a level which over the time-weighted average is equivalent to

background; that is, the level of asbestos that's in the outdoor air, that's in this courtroom. Those are the levels that you find everywhere that we're all breathing all the time.

Q And you mentioned different levels which are applied to the work place. What is the personal exposure level which was set by OSHA for asbestos in the work place?

A At the present time in the United States the exposure level is .2 fibers per cc over an eight-hour time-weighted average. So that -- that should be the average person's exposure that's set by OSHA. And that's the level that OSHA allows workers to be exposed to throughout their working lives.

Q And in the example we gave how would a person who was 8 feet away from the sawing, how would that level relate to the PEL for asbestos fibers?

A It would be -- be -- be something of the order of 1/1000th of the level of the OSHA PEL.

Q All right. Dr. Bragg, we've talked about how fibers get in the air, and we've talked about how they behave in the air. I believe you discussed a little bit about how fibers get out of the air. What is the major mechanism whereby fibers get out of the air?

A The major mechanism is as I mentioned by which they get out of indoor air is through ventilation,

infiltration, and exfiltration. They simply leave the building. Typically I would think there would be -- I could hardly conceive of a factory environment where there wasn't five air changes per hour. And under those circumstances certainly you have a level of fibers so low you couldn't detect. It would have left the building at least within an hour. More likely you wouldn't be able to detect the difference between indoor and outdoors within less than an hour.

Q Do you have an opinion regarding what the air changes per hour were at Gates?

A My understanding is there are a number of windows frequently opened, that there was a lot of heat sources in that building, that it was a multi-story building with heat sources at various levels. Under those circumstances I would think the air changes per hour would have to be at least five air changes per hour.

Q Now Dr. Bragg, are there any other mechanisms besides air exhausting fibers out of a building which would remove asbestos fibers from the air in a building?

A Yes. I mentioned when I talked about sources that you have to overcome electrostatic attraction. Attraction is if the disturbance in the room caused a particle to get very near a solid surface. But the disturbance generates concentrations of particularly

getting near solid surfaces that particulate could play out, could be attracted to the solid surface, and it would be pulled out of air that way. If that happened you'd need that same generation or disturbance process I spoke of earlier to get it back in again. So it wouldn't be a major removal mechanism, but it would certainly happen.

Q Dr. Bragg, we've heard the term reintrainment in this trial earlier on. Is that a mechanism which impacts upon asbestos in the air?

A The possibility for asbestos which was once in the air to get back into the air again depends on a disturbance. No disturbance, no overcoming adhesive forces, no resuspension. Most studies indicate that you cannot measure the suspension it is so small. Resuspension that is so small can't be measured. The reason is no disturbance, no resuspension, no focused force, and no resuspension.

Q What about walking or equipment moving? Is that sufficient to resuspend asbestos fibers into the air?

A Hypothetically it may be because the disturbance is there. However, there being any number of studies in asbestos factories, in buildings with asbestos, and buildings with damage to asbestos and so on, the levels that are present in those buildings are indistinguishable from outdoor levels; so that, while it's a hypothetical

possibility, no one has been able to measure it.

MR. SPITALNIK: Your Honor, may I approach the witness?

THE COURT: You may.

Q (By Mr. Spitalnik) Dr. Bragg, I'm handing you what's previously been marked 22-1 and 22-2 in this case. And we were -- it was indicated earlier that those show studies which highlight how reintrainment produces high concentrations of asbestos fibers in the air. Have you seen those charts before?

A Yes, I have.

Q And what relevance do they have with respect to the reintrainment of asbestos fibers in the air of a building?

A These diagrams do not relate to asbestos.

Q What do you mean by that?

A These are measurements taken with a device called a fibrous aerosol monitor. And they simply do not measure asbestos. They measure the product of the fibrous aerosol monitor.

Q What type of product would that be?

A It -- it would be any type of fiber including some quite large ones. It would typically -- if I recall the study, it would almost certainly be fabric fiber because it increases in the presence of people would be

increased by processes like pant legs rubbing together, things of that nature.

Q Well, in terms of -- in our discussion of reintrainment then did reintrainment of asbestos fibers in an industrial setting produce significant concentrations of asbestos fibers in a worker's breathing scene?

A Well again, you need a mechanism like the sawing or the sanding to do it, so that the presence of asbestos on the solid surface does not in any way imply presence in the air. You have to have the disturbance. You have to have the mechanism for getting it up there.

Q Now, we've talked about these different mechanisms whereby fibers get from solids into the air, how they behave in the air, how they're removed from a building in an industrial setting. Have you reviewed at my request a videotape which was produced by Alan Segrave to determine how these mechanisms worked in that experiment?

A Yes, I have.

Q And what is your opinion with respect to that experiment?

A My understanding of that experiment is that the ceiling of the room is one of the very few ways in which you can get zero ventilation. If I can recall correctly it was claimed that it was zero ventilation. Therefore, the air charges per hour is zero. Therefore, you are short

circuiting the natural diffusion process that occurs in any normal environment. And this is the fundamental problem with the methodology as far as showing what's happening in a factory environment.

Q Well, when you're talking about what's happening in a factory environment, why didn't we use a sealed room like that to analogize what a factory environment is?

A Well you're preventing dilution, you're maintaining the concentration, and you're preventing ventilation. There's already zero air charges per hour in this artificial environment, so you're preventing the very processes that are important in understanding what happens in the environment.

Q What about the volume of air in that experiment? Is that important in terms of whether or not we can analogize this to an industrial setting?

A Well, it -- actually it creates the exact opposite. With a sealed environment the opportunity is there for a buildup of fibers, for an increase over time. But you're preventing dilution and you're preventing ventilation which caused a decrease with time.

Q And how does the volume in the experiment relate to the volume of air at the first floor of building 10 at Gates?

A I haven't done a detailed calculation, but it

would be 1/1000th of that, or of magnitude of the volume indoors at Gates. And remember, ventilation is occurring as well.

Q Well, given your comments regarding this experiment do you have an opinion regarding whether it produced accurate data regarding how fibers are released in an industrial setting?

A In that study the structures in the asbestos fibers were measured by a method called the indirect transmission electron microscope method. That is not the AHERA. That is the -- the methodology that's used in school which is the direct transmission electron microscope. It's also not the methodology that's appropriately used to measure health effects.

What the proper measurement for measuring the health related effects is that which is recommended by the Occupational Safety and Health Administration. It's called the phase contrast optical microscope method. And it's the one that's not only used by OSHA, it's used by regulatory bodies throughout the world. No regulatory body, no testing organization has certified the indirect transmission electron microscope method which was used in that study. It's not used by any regulatory or testing body anywhere.

Q Well, can you tell us about how magnification in

the transmission electron microscope differs from the phase contrast microscope?

A In just the magnification the phase contrast microscope the one that's used to discuss -- to relate to epidemiology, the one that medical people want to know about, is about 350 power, 300 or 350 power, something of that order. And you can go to about 20,000 magnification with the indirect TEM.

Q Wouldn't we want to use a more powerful microscope to determine presence of asbestos fibers?

A You would if you want to answer the scientific question what asbestos is in the air. And if you do that the proper method is a method called the direct method TEM.

The problem with the indirect method, which is the one that was used in that study, is -- if I explained the process to you you'll see why there's a problem. You can take a large chunk of asbestos which is not respirable which is visible to the eye, size of a grain of sugar, and with the indirect method it's then put in water, a little bit of acid is added, it's vibrated ultrasonically, and then it's refiltered on to a new filter. And that's what's looked at under the microscope. Under those processes that one visible particle gets broken up into millions of little particles. And it's those millions of little particles that are counted under the microscope.

The problem is that it mischaracterizes what was in the air. What was in the air was the large particles with no possibility of being inhaled. What's being counted is that large particle being comminuted, again that word, being broken up by the use of acid and ultrasonic baths into millions of particles which are then presented as the number. And it's that breaking up that's prevented that method of the transmission electron microscope can be used properly in other ways which don't break up the particulate.

Q Why isn't this direct TEM method used by OSHA?

A The reason is that universally the medical people and the epidemiologist have created risks with respect to asbestos to the levels as measured by the OSHA optical microscope method. Medical people will be prepared to speak to you, epidemiologists will be prepared to speak to you about the levels which are disease producing and not disease producing based on phase contrast; that is, optical microscope methods. Those are the ones that they have used for some period of time now to measure the risk. And as an engineer that's why I take those measurements in order to be able to provide to these people and to the regulators and to OSHA to look at what the risks are with respect to asbestos.

Q And was phase contrast microscopy used in this

Segrave experiment?

A Not that I saw, no.

Q Well, given your comments on the experiment and the measurements taken, do you have an opinion regarding the validity of the analysis undertaken by Mr. Segrave as a result of that experiment?

A I don't think that experiment speaks to what may have been present in the atmosphere, that might have been in that plant.

Q Now --

THE COURT: So there's no doubt about it, I did not admit that experiment, and there was no foundation laid that that experiment had anything to do with the kind of testing that would have resulted from testing in building 10. That was in no way a foundation laid. It was not admitted for that purpose by any means.

And the jury could not possibly consider that experiment as demonstrating precisely the kind of levels of asbestos that may have been in building 10 back during the years that Mr. Richie worked there. So I hope that's not -- that disspells -- the reason I admitted that was for the purpose stated, not for the purpose you're asking questions about.

MR. SPITALNIK: Thank you, Your Honor.

Q (By Mr. Spitalnik) Let's move along, Dr. Bragg.

Are you familiar with the product know as industrial talc?

A Yes.

Q And these mechanisms on how fibers behave in the air, can we also apply those to talc containing tremolite?

A We can discuss those mechanisms as they apply, yes.

Q And how would they apply in that context?

A Well, if talc is being used in the process, and I understand that it was, it's being used in the process already comminuted; that is, it's already ground up and milled. Also, it will be in a drum or package or something, so it's not near a solid surface. So the first two mechanisms are already present.

In the powdered talc you don't need to have comminution. It's already been done. And we don't have a solid surface present. The other fundamental difference is if it's being used in the process, well then we can presume it is to some extent -- continuous processes are if not continuous, at least similar. So under these circumstances the possibility of a talc related emission is both greater because two of the mechanisms are no longer needed and continuous at least if the use of talc is fibrous.

Q How would the fibers released from talc behave in the air once they're in the air?

MR. METCALF: Object to the form. I don't think

there's foundation that this talc that Mr. Richie was exposed to had any fibers in it.

THE COURT: Lay a better foundation.

Q (By Mr. Spitalnik) Dr. Bragg, are you familiar with the talc produced by Southern Talc in general?

A I think I've heard information on it. I can't speak to the details of it.

Q Are you familiar with tremolite in talc?

A I am familiar with the fact that many talcs contain tremolite, yes, which is a form of asbestos.

Q And are you familiar with whether tremolite can exist in fibers?

A Yes, it can.

Q And would fibers of tremolite in the air, how would they behave?

A Fibers of tremolite being of the same size as -- or the approximate same size as asbestos -- other forms of asbestos would behave identically; that is, they would dilute and diffuse identically and leave the building identically.

Q What about raw asbestos fibers?

A Well, raw asbestos fibers if they are milled as they usually are, if they are used in a process then they are milled, they are already broken up, and they are in a bag. They are no longer near a solid surface. So the

first two processes aren't needed. And if we hypothesize that it's used in the process, that it would be used continuously or semi-continuously, then the opportunity is there for continuous or semi-continuous emission, and therefore, concentration level.

Q Dr. Bragg, we've now talked about how fibers are released from a solid, how they behave in the air, how they're removed from the air, and how different mechanisms affect asbestos insulation and talc and raw asbestos. Do you have an opinion to a reasonable degree of probability in your field of mechanical engineering whether these mechanisms occurred at Gates from 1945 to 1982?

A These mechanisms will -- quite generally they apply everywhere. And I would therefore say they would apply at Gates, yes.

MR. SPITALNIK: Thank you very much, Dr. Bragg. I have nothing further at this time.

THE COURT: Okay. We're going to take ten-minute recess. Court is in recess.

(A recess was taken, and then the following proceedings occurred outside the presence of the jury on the record.)

THE COURT: Is this the last witness today?

MR. GRAVES: No, Your Honor. We're calling Dr. Barr by deposition.

THE COURT: Well, we may have to take up an issue about whether that's going to happen or not.

MR. METCALF: That's right. We object.

THE COURT: Well, let's do it after this witness.

MR. GRAVES: Well, all right.

THE COURT: And then so there's no more live witnesses anyway?

MR. GRAVES: That's correct.

THE COURT: Tomorrow is full? Bring them in tomorrow? Do you know if tomorrow is a full day of testimony and witnesses?

MR. GRAVES: Only Dr. Case on Wednesday.

THE COURT: And then you'll rest?

MR. GRAVES: Yes.

THE COURT: Are you going to put on any rebuttal? Do you know yet?

MR. METCALF: I'm not sure, Your Honor.

THE COURT: When will you know?

MR. METCALF: Probably by tomorrow.

THE COURT: Well, let me know by tomorrow too then.

MR. GRAVES: I wonder if I could be included in that communication.

THE COURT: Yes. You should tell Mr. Graves too so he can spend the night preparing.

MR. METCALF: Well, if I -- you know there's going to be some discussion before he walks into this courtroom.

THE COURT: Well, I don't know anything about that. You're the only -- I don't have to know everything.

(The jury returned to the courtroom, and the following proceedings occurred on the record.)

THE COURT: Mr. Metcalf, you may cross-examine.

MR. METCALF: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. METCALF:

Q Dr. Bragg, there is a significant asbestos industry in Canada; isn't that correct, mining asbestos?

A Yes.

Q The Canadian government has lobbiests in Washington D.C. whose purpose is essentially to resist the regulations of asbestos in the United States, at least as it pertains to Canadian asbestos; isn't that true?

MR. SPITALNIK: Your Honor, I'm going to object to relevance.

THE COURT: Overruled.

THE WITNESS: May I have the question again, please?

Q (By Mr. Metcalf) Yes. The Canadian government has lobbiests in Washington D.C. whose purpose it is to

resist this country regulating asbestos, at least in so far as Canadian asbestos goes; isn't that true?

A I'm not sure that I have --

Q The AIA, Asbestos Information Associaion of North America for whom you have presented testimony to OSHA and EPA, is an organization made up of companies that are interested in selling and utilizing asbestos; isn't that true?

A They are users of asbestos, yes.

Q And they maintain lobbiests in Washington D.C. whose purpose it is to resist regulation of asbestos; isn't that correct?

A Yes. If I may expand on that? To influence the legislation, yes.

Q And your presentations to OSHA and to the EPA have been to attempt to influence regulation of asbestos in a way that would make regulations less strengent for asbestos than what's being proposed; isn't that correct?

A No, that's not correct.

Q That's not correct?

A My testimony on behalf of AIA for OSHA was to indicate to OSHA the levels that were being achieved in the United States using the best available technology and to identify what the consequences of the various proposed PEL's would be. My testimony on behalf of AIA before EPA

was to use the methodology of exposure analysis which EPA was using, to use data available to me, and to indicate to the EPA what the consequences were of the proper use of their risk analysis, it was not to make recommendations in either case.

Q Well, you wanted to point out that the consequences would be erroneous for the people on whose behalf you were testifying; isn't that true, that they were unnecessary?

A I did not render opinions of that nature, no.

Q Okay. And when you have made presentations on behalf of the Asbestos Institute one of the things you have advocated is that amosite and crocidolite asbestos ought to be regulated more strengently than chrysotile that's mined in Canada; isn't that correct?

A When I have spoken on that matter, the basis for what I have said has been the regulatory bodies throughout the world and the United States to discrimination between the various types is not made by regulation. In most of the countries in the world there is a discrimination by type, and many of my views reflect that discrimination by type.

Q By discrimination by type you mean your writings have indicated that amosite and crocidolite asbestos should be regulated more strengently than chrysotile asbestos

that's mined in Canada; correct?

A I have reported the results of the regulatory bodies such as the World Health Organization, International Labor Organization, the British government, the provinces of Canada. All of these regulatory bodies regulate the different types of asbestos differently. It's only in the United States to my knowledge among the major industrialized countries, there are no differences made between the various types. And I've reported that in my writings.

Q That's your belief, isn't it, that the Canadian type of asbestos should be regulated less strengently than amosite or crocidolite?

A My understanding as an engineer of the epidemiological literature, the medical literature, and the regulatory literature throughout the world is that there is a difference between the types.

Q And that, for example, amosite is more dangerous than chrysotile based on your understanding; is that true?

A That's my understanding of the epidemiology, the medical, and the regulatory effects throughout the world, yes.

Q And in fact, amosite is one of the types of asbestos used in kaylo; right?

A That's my understanding, yes.

Q Now, basically what you have been doing when you make presentations to these regulatory agencies is -- and what you've done today is to present the industry viewpoint; correct?

A No. I appear regularly with union people when I act on behalf of the Asbestos Institute. And the purpose frequently is to minimize exposures in the occupational environment.

Q This is an article you wrote, isn't it?

A Yes, it is.

Q Asbestos in the Environment and Industry Viewpoint?

A Yes, it is.

Q And that's the viewpoint you take, isn't it, the industry viewpoint?

A No, that's the view I took in that article.

Q Okay. That was 1986 you wrote that one?

A I don't recall the year.

Q Now, you talked about being a professor and some of the other activities you engage in. There's one further entity that you're connected with that you didn't describe, and that is being the owner of a corporation; isn't that true?

A I am, yes.

Q Yes. Corporation is Gordon M. Bragg &

Associates?

A Yes, it is.

Q You're the president of Gordon M. Bragg & Associates; is that right?

A Yes.

Q You're the sole stockholder of Gordon M. Bragg & Associates; is that right?

A Yes.

Q You're the sole employee of Gordon M. Bragg & Associates; correct?

A Yes.

Q Gordon M. Bragg & Associates would be the entity that's sends the bill out for your time testifying here; is that right?

A It's the entity through which I charge for work time outside the university.

Q And that's the entity that sends me a bill for taking your deposition if I took it; right?

A Yes.

Q Charge what, 190 an hour now for deposition?

A That's correct.

Q Is trial the same?

A Yes.

Q And when you travel between Waterloo, Ontario and Boulder, do you charge 190 an hour for that?

A Yes.

Q And that goes to Gordon M. Bragg & Associates and not the university; right?

A That's correct.

Q When I took your deposition that was down at the lawfirm of Tilly & Graves; is that right?

A That's correct, yes.

Q And you'd been to Tilly & Graves, what three or four other times before that?

A Yes.

Q You've been retained by Tilly & Graves in somewhere between 18 and 25 other cases; is that right?

A Potentially. I've only testified in this case at this point.

Q But you've been retained by them in a number of other cases, haven't you?

A Potentially, yes.

Q And in each of those other cases it's a case where a worker in a rubber plant made a claim for injuries on account of exposure to asbestos; is that right?

A I'm not sure they're all rubber plants, but that would characterize many of them.

Q And the other times when you've been to Tilly & Graves it's been in connection with one of these other cases coming out of rubber plants where Tilly & Graves

retained you; is that right?

A That's correct.

Q You know George Merlo, don't you?

A I've met him two or three times.

Q Met Mr. Merlo at Tilly & Graves; is that correct?

A Yes, twice I think.

Q You've met Mark Van Ert, have you not?

A Yes.

Q And you've met Mark Van Ert at Tilly & Graves; is that right?

A Yes.

Q And you and Mr. Merlo and Dr. Van Ert have traveled together to a rubber plant in Iowa to take a look at it; is that right?

A Yes, we did.

Q And with you was a lawyer from Tilly & Graves; is that right?

A Yes.

Q You've not been in the Gates plant in Denver, have you?

A I have not.

Q You've not been to a Southern Talc mine or mill in Georgia; is that right?

A No, I have not.

Q Have you prepared a written report of your work

in this particular case?

A No, I have not.

Q Were you asked by Tilly & Graves to prepare a report?

A No, I was not.

Q You've seen no documents, have you, describing any ventilation system at Gates, have you?

A I think I remember some material that may have been from Mr. Antonson or Mr. Segrave's deposition speaking about it. I don't recall the details.

Q That wasn't significant to the views you're offering today though; right?

A It's helpful to know that there are windows. It's not a sealed plant. It's helpful to know that there was heat sources. That was in some minor way helpful to me in deciding that at least five air charges per hour would be taking place.

Q You've seen no documents describing the direction of air flow at Gates, have you?

A I think I saw something somewhere that suggested there were breezes which again would indicate quite significant air change rates.

Q Well, but I was asking about the direction of these breezes.

A Not that I recall, no.

Q Were you provided with any information from Mr. William Dorris to the effect that when you walked into the mill room during the time all the equipment was in operation there was so much vibration it felt like you were walking on jello?

A I don't recall those words, no.

Q No. The principles and processes you've described here today are universally applicable; is that right?

A If they're applied properly, yes.

Q In other words, they operate in a rubber plant; right?

A If the mechanisms are present the mechanisms would be operative. The principles always apply.

Q Sure. And they operate in an office building; right?

A If the mechanisms were there the principles would apply, yes.

Q They operate in a school building; right?

A Yes.

Q Operate in a construction site; is that correct?

A If the mechanisms were present, if they were acting as I've described, then the mechanisms would apply, yes.

Q Would operate in an asbestos mine or mill; is

that right?

A Yes, that's correct.

Q Operate on board a ship; is that right?

A If they were used properly, yes, they certainly would.

Q They would be operative in the home of anybody here in court today; right?

A If they applied, yes.

Q Well, can you think of a situation where the principles that you have been describing wouldn't apply in a home, for example, electrostatic bonding of the submicroscopic particles? Do you remember talking about electrostatic bonding?

A I do.

Q That would be applicable in a person's home, wouldn't it?

A If a fiber was present near a solid surface, if it was close enough, if there was the charge, which there is likely to be, then it would be attracted to a solid surface if it was present at that position, yes.

Q Well, my coat is a solid surface; right?

A Yes, it is.

Q Carpet is solid surface; right?

A Yes.

Q Ceiling is solid surface; right?

A Yes.

Q And of course this idea of air changes in a home that had some wall and ceiling insulation, wouldn't it be your opinion that there would be what, three or four or five air changes per hour in a home like that?

A Probably two or three, yes.

Q Two or three at least.

Now, cigarette smoking consists principally of respirable particles, droplets, doesn't it?

A To some extent principally, yes, it does.

Q So if I were to blow cigarette smoke across this table, which is a solid surface, good portion of those particles would bond to the table; is that correct?

A Not necessarily, no.

Q Not necessarily?

A No. The reason for that is the electrostatic character of the smoke, the different particle size, distribution is different, the disturbance level may or may not be the same. And it's only those that are very close to the surface that would likely be displaced.

Q Now, what you've -- I want you to assume witnesses who have testified in trial at this time have described the Gates Rubber plant, the first floor of unit 10 where Mr. Richie worked during the time he worked there, as being a very dirty, dusty place, okay? When there's

other dust on the surface of things, that tends to prevent other particles from bonding to those surfaces, doesn't it?

A No, as a matter of fact it doesn't.

Q They don't somehow influence that phenomenon of electrostatic bonding? Is that what you're telling us?

A I suppose there might be a circumstance under which it might, but on solid surfaces you often get large buildups.

Q Now, I want to talk about vibration for a minute. You told us that you needed to have -- vibration would not disturb asbestos pipe covering. It would release asbestos from pipe covering because you didn't have a focused application of energy; is that right?

A No, I said that vibration would not have sufficient focus to release the type of respirable size particles.

Q Let me show you Exhibit 20-5, sir. Do you see this metal object coming down here, a pipe hanger?

A Yes, I do.

Q And when witnesses describe vibration at Gates they described these pipe hangers chewing into the ends of pipe covering. Did anybody tell you that before you got here today?

A I think I've read it in the depositions.

Q When you have a piece of metal chewing into the

end of pipe covering, that's the kind of occurrence that would be expected to release respirable fibers, isn't it?

A Not necessarily. It's a possibility, but not necessarily. The reason for that, again, is the lack of focus. It looks to me as if there's been a good deal of crushing going on. And this typically may not release respirable fibers. It's certainly going to release a significant quantity of respirable material.

Q Okay. That visible material apparently is, as I understand what you're saying, is likely to be dropped downwards with gravity?

A Probably from the looks of that. It's possible that it's a thermal expansion effect which would be even more a crushing action rather than a sanding or sawing type action.

Q Let me show you what's been marked as Exhibit 20-3. Do you have any idea what that shows?

A Look like a ventilation hood over a hopper.

Q In other words, this would tend to ventilate and exhaust material that escaped from what was being put into the hopper; is that correct?

A Are you suggesting that that's a ventilation --

Q Well, I'm asking you. What do you think that is?

A It would be difficult to hypothesize. If it was a collection hood it would be totally ineffective.

Q Okay. The asbestos that you tested, you talked about doing a test in your lab where you put asbestos on a surface and looked at it with a microscope, then blew an air hose on it and looked at it again. That was chrysotile asbestos, wasn't it?

A In the recent test it was chrysotile, yes.

Q You haven't done that with amosite asbestos, have you?

A No, I haven't.

Q Now, do I understand correctly that it's your view that respirable particles are going to be probably no bigger than 5 to 10 microns?

A With asbestos that's a very difficult question. I would suggest to you that they would have -- they're called aerodynamic diameters.

Q We looked earlier at an Exhibit No. 40 that talks about something called 901A talc. Have you ever heard of 901A talc?

A No.

Q Do you know whether or not that's the kind that was used at Gates?

A No, I don't.

Q Nobody told you that?

A I have had it suggested to me that talc was used at Gates. I don't -- and I think I've also had it

suggested to me that there was asbestiform material there. That's my knowledge.

Q Well, let's look at the size of 901A talc. Average particle size is 17 to 23; is that right?

A That's what it reads, yes.

Q And 17 to 23 microns is a size -- is at least double what respirable is; isn't that correct?

A Those average sizes 17 to 23 are averages, they're well above respirable.

MR. SPITALNIK: Excuse me. What's the date on that, Conard?

MR. METCALF: Well, I'm not sure. It has -- oh, it's October, '88.

MR. SPITALNIK: I would object, Your Honor, based upon previous rulings that anything after Mr. Richie's time frame there is not relevant.

THE COURT: Well, that was admitted by you I thought.

MR. SPITALNIK: No, sir.

Q (By Mr. Metcalf) Let me ask you this --

THE COURT: Overruled.

Q (By Mr. Metcalf) You don't have any information about whether any of the particles in 901A talc are respirable size, do you?

A If it's milled talc there is certainly going to

be a significant proportion of it that would be respirable. I don't have any independent information for that particular form of talc.

Q And you've not actually observed this talc being milled; is that correct?

A No.

Q You don't know the process by which they grade the talc to get certain sizes or grades, do you?

A I would assume it's sifted. But no, I don't.

Q Or air separated perhaps?

A That may be.

Q It's true, isn't it, that Mr. Segrave used standard transmission electron microscopy to analyze the asbestos dust that was discharged from when that kaylo was cut; isn't that right?

A No, that's incorrect. He used non-standard transmission electron microscopy of the type that's not part of the AHERA protocol, nor is it accepted by any testing certification organization such as the American Society for Testing Materials.

Q Let me ask you this, when were you first retained by Tilly & Graves?

A I don't recall, but it would be a couple of years ago.

Q And at that time it's your understanding that

they were representing Owens Corning; is that right?

A That's correct.

Q And during those years since you've been retained by them have they ever -- has Owens Corning ever provided you with a piece of kaylo?

A No.

Q Have you ever asked for a piece of kaylo to test it?

A No. My opinions are not dependent upon the product, nor are they dependent upon the type of asbestos, such as the difference between chrysotile and amosite. My discussion of the physics is a discussion that is independent of the type of asbestos and it's independent of the product.

Q So whether the asbestos in a calcium silicate base product like kaylo, whether it's mixed up with concrete wouldn't have anything to do with your opinion about fiber release; is that right?

A The harder the material the potentially more difficult it is to grind it up, to mill it, to comminute it. However, when we find -- when we go to the field when we look at exposure levels, exposure levels don't vary with the product, nor do they vary with the type of product. The only thing that causes a variation is disturbance to the material.

Q It would be your opinion, would it not, Dr. Bragg, that if asbestos was brought into my home, for example, or your home, that it would in all probability be eliminated from the home either by air exchange or electrostatic bonding within two or three hours; is that right?

A In what way are you hypothesizing? That it was brought in through the air?

Q How about on my clothes.

A If you brought in a measurable amount on your clothing and if there was a disturbance to your clothing such that it got into the air, then those mechanisms I spoke of would be active, yes.

Q And those mechanisms being air exchange and electrostatic bonding would remove those fibers from -- the respirable fibers from the air within two or three hours; is that right?

A Most likely they'd be eliminated in the outdoor air. But those mechanisms would apply, yes.

Q Now, you have no opinion concerning the levels of asbestos at which mesothelioma occurs, do you?

A I'm not a medical doctor.

Q You have no opinion about the type of fiber, the type of asbestos, and the ability to cause mesothelioma other than what you may have discussed a little earlier; is

that right?

A I have an opinion, but I'm not offering it. My expertise is as a mechanical engineer.

Q You have no opinion about the dimention or size of asbestos fibers that would be most likely to cause mesothelioma; is that right?

A Again, I have an opinion, but it's not based on my experience as a mechanical engineer.

Q Now, if I came into a home and had asbestos on my clothes and there was some disturbance that got some of it off my clothes, anybody in the home who would be exposed to that likely would not be exposed for more than what, two or three hours if they had happened to be in the same room?

A Well, I think first of all, it's a question as to whether mechanisms of that nature unless it was very extreme could cause a level that we could measure above the background levels. Remember, there's asbestos in the air everywhere at measurable levels. And the -- some of the effects may be such that they're so small that we can't significantly determine that they're significantly different from the levels that we find everywhere.

Q And Dr. Hammar when he testified showed us a chart of some occupations with asbestos exposure resulting in mesothelioma or other asbestos-related diseases. Part of this list he showed us was a page of reports of people

who developed mesothelioma, and their only exposure was living in the same house with somebody whose job involved working with asbestos. Now, it would be your testimony that that kind of exposure that was known to cause all this mesothelioma that's reported here would be at background levels?

MR. SPITALNIK: Your Honor, I'm going to object. I think he testified he has no opinion regarding levels which are sufficient to cause mesothelioma.

THE COURT: Overruled. This is cross-examination.

THE WITNESS: Could I have the question again, please?

Q (By Mr. Metcalf) You told us about if I came home and had been out cutting kaylo for a couple hours today and I come home and I got dust on my clothes and I get into the house and my kid comes up and grabs me and says hi daddy and I hug my wife and I go change clothes, that that kind of exposure they have is essentially going to be background exposure; right?

A Potentially and most likely, yes.

Q And in that case all these people that got mesothelioma from household contacts got it from background exposure. Is that your --

A I have no opinion as to what the sources of those

mesotheliomas are.

Q Are you familiar with recent reports of mesothelioma in people in buildings that just contain asbestos-containing materials such as pipe insulation or ceiling spray?

A I have heard there are reports of that nature. I gather they are under enormous criticism.

Q Well, have you seen the Anals of New York Academy of Sciences from 1991?

A May I see that, please? I think this is the conference of plaintiffs' experts that was held in New York, yes.

Q Like Dr. Bruce Case?

A I'm not sure.

Q It says here that it's printed by the New York Academy of Science.

MR. SPITALNIK: Your Honor, I'm going to object to foundation.

THE COURT: Overruled. I mean, I assume you haven't finished laying foundation yet. That's one of the doctors that's going to testify; is that correct?

MR. METCALF: Right.

Q (By Mr. Metcalf) Anyway, have you read this?

A No.

MR. METCALF: I have no other questions, Your

Honor.

MR. SPITALNIK: Just a couple questions.

REDIRECT EXAMINATION

BY MR. SPITALNIK:

Q Dr. Bragg, Mr. Metcalf asked you a little earlier about different types of asbestos fibers. Now, do you have an opinion regarding what type of asbestos fiber poses the most significant health risks?

A I'm a mechanical engineer. When I speak of risks I quote other experts and other regulatory bodies.

Q And we also talked briefly about the direction of air flow. Does the direction of breezes in a building impact upon the dilution of concentration of fibers?

A Not on average.

Q And can you explain that.

A If we hypothesize that a draft of air went say in one direction, then a person who is downstream of that might get a higher instantaneous value during that time. However, there's an equal probability that that breeze will go the other way, and in the other times the level will be zero. So that on average the dilution is, as I stated earlier, instantaneous. That may mean a whole lot of zero exposures. Then this may be one or two or three or four times zero.

Q So how does the direction of breezes impact upon

a time-weighted exposure?

A When you take the eight-hour time-weighted average as you should do for the occupational exposure, the direction would have no effect because the averaging is what is done, what is important, and what is necessary to do.

MR. SPITALNIK: Your Honor, may I approach the witness?

THE COURT: You may.

Q (By Mr. Spitalnik) Mr. Metcalf talked to you about Exhibit 20-3, and I believe that you pointed out that if this was a collection hood it would be totally ineffective. Why is that?

A Well again, I point out that the smaller duct is what was pointed to here. And it is very common knowledge and very important to the occupational hygiene and ventilation people to know how short a distance these hoods have an influence.

The -- the typical way of describing this is these hoods collect within a distance away from the hood equal to the width of the hood. And a situation we're all aware of that explains that if you want to know how neffective a section can be, think about not trying to blow out a match, but trying to suck out a match, how very close to your lips to get to be able to extinguish a match by

sucking. You realize how very close you have to get.

The other experience is when you're vacuuming you lose efficiency vacuuming the minute the vacuum is not quite close to the surface, the minute you lift the vacuum away from the surface it becomes ineffective. The same is true of these hoods. So their influence is only a very short distance away.

Q How would that hood impact on fiber concentrations which were not in the immediate vicinity of that hood?

A Within a distance equal to the width of the hood would be effective zero effect.

Q We also talked about on cross-examination talc. And you mentioned that if talc is milled, a significant portion of that talc would be respirable. Why is that?

A Well, because there's always a distribution; that is, if that's the average size, then there will be some much larger pieces and of necessity some much smaller pieces. When you consider that a pile of milled talc say a pound or two would have millions maybe billions of individual pieces, there's plenty of opportunity for the very small respirable ones to exist in that pile.

Q And also on cross-examination you talked about a hypothetical where Mr. Metcalf comes home with fibers on his clothes and talked about how the vast majority of those

fibers would be exhausted by ventilation and that some fibers would be adhered to surfaces. Are those adhered fibers still in the building?

A If there are adhering to solid surfaces in the building, yes, they're still in the building.

Q Are they in the air though?

A No, they're not going to get in the air at the moment. There's been an amount of -- measurement of asbestos levels in buildings which contain asbestos, biuldings which contained damaged asbestos, and buildings which contain no asbestos and outdoor asbestos levels. In the vast majority of cases there is no significant difference in airborne asbestos levels between any of these groups; that is, the airborne asbestos level in buildings with no asbestos is comparable to those in buildings with damaged asbestos to take one of those examples. And this is part of the basis for being able to say that these kinds of minimal exposure levels that you might get from these things are not distinguishable from these background levels.

MR. SPITALNIK: Thank you very much.

THE COURT: Any recross?

RECROSS-EXAMINATION

BY MR. METCALF:

Q Dr. Bragg, do you have any idea why you were

asked about PEL's, the average over a day, what is a peak exposure?

MR. SPITALNIK: Your Honor, I'm going to object. I think that's beyond the scope of redirect.

THE COURT: No, I think it is.

MR. METCALF: Well, it relates directly to these average exposures in terms of what happens when you get a very short term high intensity exposure.

THE COURT: All right. Objection overruled.

THE WITNESS: Can I have the question again, please?

Q (By Mr. Metcalf) What's a peak exposure?

A A peak exposure is what regulations allow for shorter periods of time, typically for 15 minutes or half an hour. That purpose is to prevent the average being generated from say 5 minutes of a very, very, very high exposure. That is also disallowed in regulations.

Q Are you prepared to offer any opinion on what the biological significance is of a peak exposure as opposed to the same amount over a long period?

A I don't offer medical opinions. But it is my understanding from the regulatory literature that asbestos is a chronic exposure and not an acute exposure. And that means that it is the longer term averages that are of importance.

Q So that, for example, a high intensity short-term exposure wouldn't override the lung defense mechanisms and cause retention of more asbestos?

MR. SPITALNIK: Your Honor, I'm going to object again. It's been stated many times he has no medical opinions regarding mesothelioma.

THE COURT: That's going to be his answer.

MR. METCALF: Then if that's his answer I haven't heard his answer.

THE WITNESS: I have been speaking outside my expertise.

Q (By Mr. Metcalf) Okay. On average, Dr. Bragg, if I got my one foot in a pail of boiling water and the other in a pail of ice water I'll be comfortable, won't I, on average?

MR. SPITALNIK: Objection, Your Honor.

THE COURT: The objection is sustained.

MR. METCALF: No further questions.

THE COURT: That crosses the line that defines an argumentative question.

You may step down.

I'm going to ask the jury to step out a minute. We may be through for the day, but we may not. So I'm going take up a legal matter, then we'll bring you back.

(The jury left the courtroom, and the following

proceedings were had on the record.)

THE COURT: They ought to make the evidence classes come to these trials. They can learn so much. It demonstrates all kinds of obscure evidentiary issues such as which lawyer can properly move to request the witness to give a responsive answer. And although I think the law is changing in that regard or, you know, what's an argumentative answer, and my research discloses it has a lot to do with the context, the tone of voice. And although neither of those things were relevant in Mr. Metcalf's last question, clearly it was -- that statement was not a question. And that means it's argumentative.

MR. GRAVES: The only reason it was held argumentative was because he didn't raise his voice at the end. He could have gotten away with it if he raised his voice at the end.

THE COURT: I don't think so. That sounds like a statement to me.

MR. GRAVES: All right.

THE COURT: If his voice would have indicated a question mark it still would have been an exclamation to me. It was a statement to the jury.

With regard --

MR. GRAVES: Do we have another evidentiary

issue? I hope we don't because I fully expect to be able to call Dr. Nancy Barr by deposition.

THE COURT: Well, now this sounds to me, Mr. Graves -- I remember hearing you say the words Mr. Metcalf is on a fishing expedition. He's just fishing for a new expert and trying to find one.

MR. GRAVES: Exactly. That's the predicate upon which I seek admission of this testimony.

You may recall that I resisted this deposition. I resisted it on the basis that it performed no function in this case. It was not to determine the basis of Dr. Sherwin's opinion. It was an admitted and flagrant statement that they're trying to determine whether or not Dr. Barr should be a witness in this court. I objected on that basis because she had not been designated as a witness.

Now -- now, the Court wasted a half a day while this deposition was obtained, and then even another hour the next day so that we could obtain this marvelous transcript, okay?

Before that deposition was taken I stood up in this court and I pointed to Mr. Metcalf or Mr. Patrick, I don't recall which, and I said if this deposition turns out favorable to OCF, OCF is endorsing this witness. So proceed at your risk. And low and behold we find that

there's some favorable testimony.

I withdraw all my objections to the deposition. I withdraw every objection to every question that was raised. And I ask that the Court permit this deposition to go forward because there have been statements made by Dr. Sherwin that indeed there was some reliance upon Dr. Barr.

Dr. Barr has been eluded to throughout the course of the trial, and I think it's only fair now for the jury to get the entire picture regarding the immunohistochemical testing undertaken by Dr. Barr.

Now, at the conclusion of the deposition I immediately called Dr. Barr and asked her if she could come forward and testify in person. And of course she refused. And I said look, Judge Sandstead needs something more than that. Would you write me a letter saying you can or you cannot.

I have in my hand a letter dated November 20th saying "Dear Mr. Graves, I will be unable to participate in trial regarding Curtis Richie through December 15, 1992 due to my responsibilities as Laboratory Director and Professor at USC."

I've done my best to get her here, and I think she would be a delightful witness. She sounds like a delightful person once we got a hold of her. But in as

much as she's more than 100 miles from the court, I have not -- I've done my best to get her here. This Court has wasted valuable judicial resources in obtaining this deposition. And if it's not put to use, then I think it's travesty. At least it ought to be used now that it's been taken and this Court has gone through so many hoops to allow it to be taken.

THE COURT: Do you want to make a record, Mr. Metcalf?

MR. METCALF: Yes, I do.

I guess first I would comment that if every deposition that was taken was subject to Mr. Graves' arguments, we would be here from now until 1994 reading them because wouldn't it be a shame not to use them once taken.

Dr. Sherwin's testimony I think pointed out that Dr. Barr was more than just a technician. She provided the interpretation of the results. And that's why we wanted to take Dr. Barr's deposition was to see what the heck her interpretation really was so we know whether or not Sherwin's reliance on it was accurate. So we finally took her discovery deposition, and she said what basically she said in her report.

Now, Dr. Sherwin read the parts of Dr. Barr's deposition into evidence today that counsel wanted him to

read, and he testified at length about what Dr. Barr did and the tests she did and the meaning of it. Nobody has ever endorsed Dr. Barr as a witness. So on that ground alone I would suggest that it would be inappropriate to present that deposition at this point. And counsel got it all in already through Dr. Sherwin. So I object.

MR. GRAVES: If I may respond briefly, Your Honor. Apparently designation of witnesses plays no role on plaintiff's side of the bar. We seem to have these mysterious people come in with videos that have no basis at all in the courtroom whatsoever. Even from Judge Sandstead's own lips I heard today that we really don't have to worry about that deposition as being reflective of what's going on at the Gates plant. I have no idea, Your Honor, what the purpose of that deposition is now.

THE COURT: To show when you saw asbestos how much drops off into the air. This helped the jury see that asbestos does become loose when you saw it. That's what it was for.

MR. GRAVES: But it doesn't show asbestos loose. It shows white particles. The jury new that. And it's not the fibers you see. You don't see fibers. So what I'm -- I'm sorry.

I didn't mean to digress on that point, and I would like to discuss that further with you when we get

through this. The point I'm trying to make is there have been loose endorsements all the way through this trial, and that one is the most prejudicial as far as the defendants are concerned. We even have people that haven't even bothered to submit reports and have been permited to testify. This lady has been subjected to rigorous cross-examination.

I think what's most important, Your Honor, is the last page which I ask you to consider. I did not read the last page. I'm saving that for the jury, and I think it's very important for the jury to hear this. This is when I began my examination.

Question, "And do I construe your reports and Dr. Taylor's reports correctly that based on all of the evidence that you have before you, that the immunohistochemistry favors carcinoma as opposed to mesothelioma?"

Answer, "Yes." End of story.

The point is that is very, very powerful stuff. Here is a lady that did 25 separate antibody tests and she evaluated them in lugubrious detail and described them at great length to Mr. Patrick. There's no question as to the foundation of her opinion. It's solid and good stuff. And I think the jury should have the benefit of that because immunohistochemistry seems to be the banner on which flies

the plaintiff's case.

So therefore, Your Honor, I'm asking that fundamental fairness be applied here. I'm entitled to at least get the benefits that the plaintiff had under similar circumstances, and most importantly, with very probative type evidence.

THE COURT: I find beyond any doubt that to permit Dr. Barr to testify by deposition would be a complete and utter violation of the Court's responsibility under Rule 403 and under 611, to prevent confusion of issues, misleading of the jury, considerations of undue unduly waste of time, needless presentation of cumulative evidence.

I permitted the deposition of Dr. Barr because plaintiff advised the Court that she was being relied upon for his opinion in expressing his opinions; that is, of Dr. Sherwin, that that was not mesothelioma. He was permitted to do that at great length during his testimony today. And for that reason I will deny the right to call Dr. Barr as a witness and for any purpose.

MR. GRAVES: Your Honor, I would like to make an offer of proof of the transcript dated November 20, 1992 and the letter from Dr. Barr, which I will mark as a joint exhibit, No. 476.

THE COURT: I will make a record by saying I beg

the Court of Appeals upon reading this transcript to pay particular attention, very close attention, to the detailed testimony of Dr. Sherwin and to this deposition of Dr. Barr, upon whom Dr. Sherwin sort of relied, but not really, according to his own testimony.

MR. GRAVES: Thank you.

THE COURT: So I'll put them in the -- I have a bunch of what I call court exhibits. But you can call it whatever you want so that the record is clear.

MR. GRAVES: Yeah.

THE COURT: The Court has this abiding fear that unless the entire record of every second of this trial is read in great detail by the Court of Appeals, the Court's rulings cannot be understood. In fact, based on the rulings here, some of which rely on the history that this Court has had in trying these cases, I think it's incumbant upon any appellate court to appropriately under this Court's rulings understand the legal issues involved; that they read the transcripts of all 15 trials and all of the detailed motions and rulings in all of those cases in order to understand completely the rulings of this Court in this case and in others in the past.

MR. GRAVES: I would hope, Your Honor, that if appeal is required in this case that you would not require the parties to certify the library that you've incorporated

and all of the transcripts of the 15 trials. I would beg that you not do that.

THE COURT: I will incorporate whatever I can get so they can read it all, because if it's not read the issues cannot possibly be understood.

MR. GRAVES: But then that prohibits appeal because there would -- would be no way that any party could possibly justify the Court of the cost of that record.

THE COURT: Well, that's an interesting proposition.

Well, can I send the jury home then?

MR. GRAVES: I'm sorry, Your Honor. That's what I was counting on doing for this last 35 minutes.

THE COURT: Tell me who is -- oh, well, I don't need to know.

We are ready to go for a full day tomorrow, or can I tell them it's not going to be full?

MR. GRAVES: It's going to be --

MR. SPITALNIK: It's a full day tomorrow.

THE COURT: What can I tell them about Wednesday? We should have the evidence -- well, I don't know because you won't know until tomorrow.

MR. METCALF: Yeah, I -- I can get rebuttal testimony. I will definitely try to have that person here, it will be Wednesday, so that we can get it to the jury on

Thursday. There's a possibility that, you know, in scheduling that I couldn't get anybody here until Thursday morning. It's not going to be Dr. Teitelbaum.

THE COURT: I was going to say I need to know for Mr. Graves' sake and for mine. And so I don't have to know anymore about it if it won't be Dr. Teitelbaum.

MR. METCALF: One of the people I have attempted to contact about this is Dr. Rose.

MR. GRAVES: I would say, Your Honor, I've had no chance to depose Dr. Rose. What counsel is saying is I must do in the face of every case is to depose the 2,000 experts that he's listed in this monster called CV2000. I think it would be fundamentally unfair.

THE COURT: Didn't Dr. Rose testify in this case?

MR. GRAVES: No way.

THE COURT: She didn't?

MR. METCALF: No.

THE COURT: That was last month.

MR. GRAVES: I have never seen the woman, never had anything to do with her in the courtroom. Therefore, I'm starting in square one. That would be fundamentally unfair. And I ask the Court to consider that in advance.

THE COURT: Well, let Mr. Metcalf ponder that himself before I rule.

Well, Mr. Graves just handed the Court

Defendant's Exhibit OCF 476. It includes the telephonic deposition of Nancy Jean Barr and her letter dated --

MR. GRAVES: I think it's on the inside cover.

THE COURT: Oh, November 20th. And they are made a part of the record.

Would anybody object if I asked my law clerk to go in and tell them they can go home?

MR. METCALF: No objection.

THE COURT: All right. Nine o'clock.

MR. GRAVES: All right. Could we take up one thing? We don't need this on the record as far as I'm concerned.

THE COURT: All right

(The trial concluded for the day.)

* * * * *

CERTIFICATE

The above and foregoing is a true and accurate transcription of my stenotype notes taken in my capacity as Official Court Reporter, Division V, District Court, County of Boulder, State of Colorado.

Dated this the 9th day of June, 1993.

DAWN R. McWILLIAMS, CSR
Official Court Reporter