

UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF ALASKA

UNITED STATES OF AMERICA,) Case No. A98-0158-CR (JKS)
))
 Plaintiff,))
) Anchorage, Alaska
 vs.) Tuesday, February 23, 1999
) 9:44 o'clock a.m.
CONSTANCE M. WALKER,))
))
 Defendant.))
))
_____)

**EVIDENTIARY HEARING ON DEFENDANT'S MOTION IN LIMINE
TO PRECLUDE ADMISSION OF DEFENDANT'S POLYGRAPH EXAMINATION**

VOLUME 1

TRANSCRIPT OF PROCEEDINGS

BEFORE THE HONORABLE JOHN D. ROBERTS
UNITED STATES MAGISTRATE JUDGE

APPEARANCES:

For the Plaintiff: STEPHAN A. COLLINS
 Assistant U.S. Attorney
 U.S. Attorney's Office
 222 West 7th Avenue, #9, Room 253
 Anchorage, Alaska 99513-7567
 (907) 271-5071

For the Defendant: KEVIN F. McCOY
 Assistant Defender
 Federal Defender's Office
 550 West 7th Avenue, Suite 1600
 Anchorage, Alaska 99501
 (907) 271-2277

Court Recorders: ROY VAN HOLLEBEKE
 LINDA CHRISTENSEN
 U.S. District Court
 222 West 7th Avenue
 Anchorage, Alaska 99513-7564
 (907) 271-5629

APPEARANCES (Continued):

Transcription Service: A & T TRANSCRIPTS
5321 Larkspur Street
Anchorage, Alaska 99507
(907) 562-3613

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ANCHORAGE, ALASKA - TUESDAY, FEBRUARY 23, 1999

(Call to Order of the Court at 9:44 a.m.)

(Defendant present)

THE CLERK: On record.

THE COURT: The defendant has filed an opposition motion. The government is entitled to reply. Did you want to do that orally, or do you need some additional time?

MR. COLLINS: I believe I can respond orally, Your Honor. The defense filed a -- served a subpoena labeled Custodian of Records, United States Postal Service. Previously there was a hearing in which we established that there are essentially two houses; there's the Postal Service side and there's the Postal Inspector side. The subpoena was served on Friday to an employee of the United States Postal Service, an inspector, not the custodian of records.

The subpoena requested a copy of manuals, training materials. It did not specify as to time frame, did not specify what particular portions of the manuals. It lacked specificity in that it can refer to any types of materials that may or may not have been produced by the United States Postal Service, Inspectors Division. It lacks specifics -- if it refers to materials that are -- were not prepared by the United States Postal Service, then the subpoena is inappropriate, because then the defense can seek it through other means.

The subpoena was dated -- this time of service, 9 a.m.

today, February 23rd, the date right -- this evidentiary hearing which we're about to enter into on the polygraph examination. The government's position as stated in the documents, in the motion to quash, that the subpoena cannot be used for evidentiary hearings purposes. The -- it appears to be a discovery motion -- or attempt to gather discovery or to ferret out through the files of the United States Postal Service for whatever materials I believe will be used for impeachment purposes, which is an improper use of the subpoena.

The materials also requested may cover information that the United States Postal Inspector Service deems to be sensitive information. In that regard the subpoena is overly broad and is not tailored specifically for an issuance at this time. It was served on Friday and in order to -- if the Service were to be directed to comply, they would be required to ferret through whatever documents that they have, which I would submit are in the thousands, and that in order to comply by today would be unduly burdensome. So I think there's a basis for quashing the subpoena.

THE COURT: The Court will rule on the matter at this time. The subpoena asked the documents to be presented at this hearing. Defense acknowledges in the opposition that they're not related to the *Daubert* hearing which is set today. At most, it's a premature motion. Documents that might relate to trial cannot be obtained at this time. If it's to avoid another suppression hearing, I don't think that's a valid purpose. It's -- basically appears to be a discovery motion.

The Court will grant the motion to quash. In the case that it's reissued or resought by defense, you might want to make it more narrow, because the government has objected to it as being broad. The sensitivity part can be addressed by having something submitted for an in camera inspection first.

I'm not as concerned about the proper service. It says Custodian of Records and it was received by the Postal Service. I'm not as concerned about that aspect of it. But as far as the timeliness of it goes, the motion is granted.

So we'll proceed with the hearing. Mr. McCoy, the burden is on you to go forward. Do the parties want to make a preliminary statement first?

MR. COLLINS: If I may speak first, may we excuse Inspector Bennett, who appeared to respond? May -- be excused at this time?

THE COURT: Yes.

MR. COLLINS: As a preliminary matter, Mr. McCoy and I have discussed the stipulation to the admission of certain documents, and somewhat in the same vein as those the defense submitted. Two articles the government would seek to submit on the -- on reviews of the directed lie control question technique. Plaintiff's Exhibit 1 is an article entitled The Directed Lie Control Question, authored by Dr. Stanley -- or Dr. Stan Abrams, the government's intended expert on this issue at this hearing.

Plaintiff's Exhibit 2 is An Analysis of the Psychodynamics of the Directed Lie Control Question in the

Control Question Technique, authored by Dr. Matte. That's Plaintiff's Exhibit 2.

Plaintiff's Exhibit 3 is the curriculum vitae of Dr. Stanley Abrams, much like the defense submitted the curriculum vitae of Dr. Raskin. We agreed to the stipulation of the admission of that.

Plaintiff's Exhibits which are marked 4A and 4B for the purpose of indicating that they're two tapes, is the recording of the actual polygraph examination, the audio recording of the actual polygraph examination administered to Mrs. Walker, and this is a copy of the tapes provided by the defense to the government.

Plaintiff's Exhibit 5 is a copy of the transcript in the *United States versus Cordova* district court hearing. Much like the defense submitted some transcripts of other hearings on the polygraph, the government presents that for the Court's consideration.

THE COURT: You say the *Cordova*?

MR. COLLINS: The *Cordova* case. The district court hearing was held after the --

THE COURT: This is *Cordova 2*, the one after the appeal?

MR. COLLINS: Correct. Preliminarily, there's also the issue of how we're to proceed, I guess in order to provide at least direction to myself. The defense has submitted in its notebook of exhibits the affidavit of Dr. Raskin which contains not only his assessment of the validity of polygraphy, the technique used in this case, as well as his conclusions.

The -- that procedure was followed in the *Cordova* matter, where the defense submitted the affidavit, and then the court proceeded with the cross-examination of Dr. Raskin, and then the defense was permitted a redirect. So in essence, it appears that in *Cordova* they avoided the direct examination of Dr. Raskin because in essence his testimony was contained in the affidavit which was submitted in that case. And in a similar vein, the affidavit submitted in this case essentially contains his testimony.

So if -- does the Court wish to proceed with a direct examination encompassing a repetition of his affidavit, or does the -- would the Court prefer to proceed with a cross-examination of Dr. Raskin and allow redirect?

THE COURT: Let me hear from Mr. McCoy first.

MR. McCOY: Your Honor, I prepared a presentation for Dr. Raskin to outline how the *Daubert* standard works and how the polygraph that's at issue here meets that *Daubert* standard. That affidavit is a mere summary and is nowhere the type of affidavit that was submitted in the *Cordova* case. I specifically request and want to go forward with the direct so we can outline and make the appropriate record in this case. So I -- this is the first I've heard of this suggestion. The affidavit is nothing more than a brief summary of what Dr. Raskin did. This Court's not going to have a sense of the *Daubert* factors or what he did just from that affidavit. So I object to proceeding in that fashion.

THE COURT: You have the right to put on the evidence as

you choose. You have the burden of going forward, as I said, and so I'll permit you to do it in the manner you choose.

MR. McCOY: With regard to the exhibits that Mr. Collins has proffered, I have no objection at all as to all of them save 5, which I believe is the *Cordova* transcript. I doubt I'm going to have an objection to that. I think I just want the noon hour to quickly look at it and see whether I have a basis, but probably not. So if I could just reserve my decision on that until the noon break, I'd be able to advise the Court shortly after the noon break of what my -- what I feel about that. Is that agreeable?

THE COURT: Yes.

(Plaintiff's Exhibits 1, 2, 3, 4A, and 4B admitted by stipulation)

MR. McCOY: All right. What I'd like to do now is proceed with the evidentiary hearing, if the Court's prepared to take evidence?

THE COURT: Yes.

MR. McCOY: All right. At this time I'd call Dr. David Raskin to the stand. Dr. Raskin, if you would step up to the clerk and take an oath, you'll be sworn.

DAVID C. RASKIN, PH.D., DEFENDANT'S WITNESS, SWORN

THE CLERK: Please be seated at the witness box. For the record, sir, would you please state your full name, address, and spell your last name?

THE WITNESS: David C. Raskin, R-a-s-k-i-n. My address is Post Office Box 2419, Homer, Alaska, 99603.

THE CLERK: And is it M.D.?

THE WITNESS: Ph.D.

THE CLERK: Ph.D. Thank you.

MR. McCOY: May I inquire?

THE COURT: May proceed, yes.

MR. McCOY: Thank you, Your Honor.

DIRECT EXAMINATION

BY MR. McCOY:

Q Good morning, Dr. Raskin.

A Good morning.

Q I want to ask you a few questions about your background to begin our process here today. Could you tell us what your occupation is, please?

A I'm a professor emeritus of psychology from the University of Utah --

Q All right.

A -- where I hold a lifetime appointment. And I am a forensic psychology consultant.

Q All right. In the area of psychology, do you have any areas in which you specialize in?

A Yes. I specialize in experimental psychology, psychology and law, and human psychophysiology.

Q All right. With regard to human psychophysiology, could you describe for Judge Roberts what that is?

A Human psychophysiology is a scientific discipline in which scientists, primarily psychologists, but also physiologists engineers, and medical people, conduct research where they

measure bodily reactions in controlled situations, and from understanding what stimulation is presented to the individual and how the body generates physiological reactions, the scientists attempt to make inferences about psychological states and mental processes.

Q Okay. Is psychophysiology a recognized subspecialty of the field of psychology?

A Yes, it is.

Q All right. And is it a body of knowledge that is based on scientific principles?

A Yes, it's a very heavily scientifically-based and technology-based discipline.

Q Why was it that you selected this as a subspecialty to explore during your academic years?

A Well, I began my academic training in engineering, and frankly, I got a little bored with engineering. And so I -- I moved from that to mathematics and then I -- I encountered physiological psychology as an undergraduate in a course and found it fascinating, because it combined a lot of the things that I'd always been interested in. And then I started graduate school in clinical psychology but found that that was not really a very scientific discipline. It was more involved with treating people and doing, you know, talk therapy and things like that, and it just didn't embody science to the

extent that I felt comfortable with. And then I discovered psychophysiology. I happened to be at UCLA doing my graduate work, which is one of the -- the centers for psychophysiology in the world.

Q Uh-huh (affirmative).

A And I had the good fortune to study with some of the top people in the world in that field.

Q All right. Well, you've mentioned UCLA. Could you describe for the record and for Judge Roberts what your educational background is?

A Well, I received my bachelor's, master's, and Ph.D. degrees from UCLA in 1957, 1960, and 1963, respectively.

Q Uh-huh (affirmative). Have you belonged to any professional and honorary organizations in connection with your studies?

A Yes, I have.

Q And do you belong to any psychophysiological organizations?

A Yes. Well, I -- I belong to a variety of organizations that have psychophysiologicalists as well as one specifically in psychophysiology. I'm an elected fellow of the American Psychological Association, a charter fellow of the American Psychological Society, a member of the American Psychology Law-Society. I'm a member and past president of the Rocky Mountain Psychological Association. And I'm a member of the Society for

Psychophysiological Research, which is the International Scientific Society for Psychophysiolgists. And I've served on the board of directors, elected to that, as well as been selected to run for president three times, fortunately not elected.

Q And these are the offices that you've held at these various organizations?

A Yes, as well as having held offices as serving on editorial boards for the scientific journals in these associations. I've served as an associate editor of the Journal of Psychophysiology and also as a member of the editorial board of the Journal of Experimental Psychology, and also as a consulting editor for about 20 other scientific journals.

Q Okay. Could you touch briefly on how these organizations that you've identified relate to the field of expertise that you'll be testifying to today?

A Well, polygraph techniques are an application of human psychophysiology and psychology. And so the polygraph technique is derived from the use of scientific instruments known as polygraphs which were originally developed by psychophysiolgists.

Q Uh-huh (affirmative).

A In fact, one of my professors was a pioneer in that area. And using that technology combined with the understanding of

psychology and psychophysiology, one can make measurements in controlled situations, and polygraph techniques are a special controlled situation where one asks questions, which are the stimuli, carefully-crafted questions, in a standard psychological protocol, and makes recordings using polygraph instrumentation, and then interprets those recordings in terms of what was asked and what reactions were observed to make inferences about a particular psychological state, the existence or nonexistence of the state of deception, attempting to deceive.

Q Okay. How long have you been studying psychophysiology and the polygraph?

A I began working in psychophysiology in 1958, so that's 41 years.

Q All right.

A And the polygraph as it's used in the vernacular, the so-called lie detector, I've been studying that since 1970, so that would be 29 years.

Q Has there ever been a meeting specifically honoring you and your research in these fields?

A Yes.

Q Would you tell Judge Roberts about that, please?

A Well, when I took early retirement from the University of Utah and became an emeritus professor, the -- some of the

members of the Society for Psychological Research, including two of the past presidents, put together a symposium in the annual meeting in Toronto, Canada in 1995 in which they honored me -- it was probably the greatest honor I've had in my academic career -- for my contributions to the field of psychology and particularly specifically with my contributions to the field of polygraph science.

Q Who in the field attended this symposium?

A Well, there were people from probably many subspecialties within psychophysiology; of course, many of my former students who --

Q Uh-huh (affirmative).

A -- have become well-known psychophysiolgists in their own right, and others, including Edward Katkin, who's a recent past president of the society and a renowned psychophysiolgist, and Stephen Porges, who's also a past president and renowned psychophysiolgist. And some of my students who are well known in this field, and many others who -- who attended it out of interest and who are --

Q All right.

A -- professional and personal friends.

Q And who was it, if you didn't mention, who organized the meeting, the symposium?

A Well, I think the organizers were Dr. Porges --

Q Uh-huh (affirmative).

A -- and Dr. Honts -- or Dr. Kircher. I can't remember --

Q Uh-huh (affirmative).

A I think -- both -- both of -- all three of those had been my students at one time.

Q All right. You have before you Exhibit A; could you tell us what that is?

A I believe that's my curriculum vitae.

Q Yeah.

MR. McCOY: Your Honor, I'd offer Defendant's Exhibit A as a summary of Dr. Raskin's professional and educational background.

THE COURT: Any objection?

MR. COLLINS: I believe we've stipulated to the admission --

MR. McCOY: That's fine.

MR. COLLINS: -- but we'll go and --

THE COURT: Exhibit A is admitted.

(Defendant's Exhibit A admitted)

BY MR. McCOY:

Q I want to talk about your time at the University of Utah. Could you tell us when it was that you were employed as a professor with the University of Utah?

A My first appointment there was in 1968 as associate

professor, and then I was promoted to professor in 1972.

Q All right. And did you teach classes at the university?

A Yes, I taught a full load of classes --

Q All right. And --

A -- as well as research.

Q And what were the range of classes that you taught?

A I taught the full range of classes, from introductory psychology through specialized laboratory techniques for graduate students in psychophysiology. And I included in that human learning, memory, experimental design and research methods, special courses on topics of interest at the time, history and systems of psychology, psychology and law, including of course the -- the -- organized for the law school at the University of Utah. And courses in psychophysiology, and a variety of other special topics as --

Q And the research that you did as well as teach, did that have a focus?

A Yes, the research I did always had a focus, I hope. But that shifted over time as my interest changed. That's one of the nice things about academic life, is one can pursue interests as they become important or attractive, and --

Q Uh-huh (affirmative).

A -- so my early research began in human learning and human memory and intellectual processes, and then into physiolog- --

psychophysiological studies of human learning and conditioning and using polygraphs for that purpose. And then I moved into studying attention, using physiological methods and studying pathological populations such as schizophrenics. I had grants from the federal government and National Institute of Mental Health to do work in that area, and I also did research in biofeedback, having to do with people learning or not learning to control their physiological responses.

And -- oh, I left out that early in my career I did some rat research too in terms of learning. I -- I guess I tend to repress that.

Q All right.

A And then -- then I later moved into the area of polygraph techniques because of an interest that developed in 1970. And that became a major focus of my work. And in recent years I also added to that work in psychology and law and research and development in the area of interview techniques, particularly with children, and in sexual abuse cases and analysis of witness statements.

Q All right. Have you served at other universities as well as the University of Utah?

A Yes.

Q And did you teach classes at those universities?

A Yes, I did.

Q What other universities were they?

A Well, I taught for two years at UCLA after I received my Ph.D. and then I moved on to Michigan State University, where I was hired in 1965 as an assistant professor of psychology, and promoted to associate professor in 1968. And then I left that year and went to the University of Utah. I also was a visiting professor at the University of British Columbia in Vancouver, Canada in 1974-'75.

Q All right. What is it that you do now, sir?

A Now I continue to do a lot of writing in these areas and collaborate on research with my former students, particular Dr. Kircher at the University of Utah and Dr. Honts at Posey (ph) State University. And I contribute chapters and writings for legal publications as well and also Journal articles that we prepared on various topics. And I do training and workshops around the United States and in Canada, and I do consulting for attorneys and law enforcement --

Q All right.

A -- and training.

Q What is original research?

A Original research? Well, that's --

Q Yes, sir.

A -- something that somebody does that somebody else hasn't quite --

Q All right.

A -- done that way.

Q Have you conducted original research during the course of your career?

A Yes. The majority of my time at the various universities since I got -- since I left UCLA -- well, even at UCLA -- has been in research. The teaching, although it's time consuming for the type of positions I've had and the institutions I've been, the teaching is a lesser commitment of time than conducting scientific research, getting federal grants on which to conduct this research, and publishing in scholarly journals about the results of that research.

Q And what areas have you conducted original research in over the years?

A Oh, I think I described those earlier --

Q Right.

A -- in terms of my research interests, yeah.

Q Be fine. And when you've performed original research, have you published the results?

A Yes.

Q And have you subjected the -- your research results to peer review?

A Yes, the publications that I have authored or co-authored have been routinely submitted either to scientific journals

which have a very rigorous peer review, or through other editorial processes, such as when a book is edited, the -- they -- it also goes through extensive review by the editors of that --

Q All right.

A -- and often are sent out to consultants. So -- and also sometimes the -- the grants that I've had, I've had many grants from the federal government for this research. The grants themselves initially are subjected to very rigorous review before one gets the funds, and --

Q Okay.

A -- getting the funds is, you know, sort of a low-probability thing. So when you get those, they've gone through an extensive peer review process. And then after you finish it and you submit the final reports, those are also reviewed by the agencies and then accepted.

Q Okay. Well, we'll discuss the peer review process in detail later, but I wanted to touch on it now. Could you tell me who John Podlesny is?

A John Podlesny is a former student of mine who got his master's and Ph.D. degrees with me in psychophysiology at the University of Utah and then took a position in 1982, I think it was, as the director of polygraph research for the Federal Bureau of Investigation at Quantico, at the academy, and held

that position until about 1996, I think it was, when they abandoned that effort because it duplicated the Department of Defense Polygraph Institute. So he ran the -- the polygraph research lab for the FBI during its entire existence. He now is in another division of the FBI, doing research on methods of detecting --

Q Okay.

A -- terrorism and environmental issues.

Q You have before you Defendant's Exhibit B. I would ask you to look at it and tell me if you recognize it.

A Yes, I do.

Q Okay. And would you tell us what the significance of this article is?

A Well, this is an article by Dr. Podlesny and his co-worker Connie Truslow on an expanded-issue polygraph technique. And what it represents is a typical high-quality scientific publication in a very high-quality scientific journal, the Journal of Applied Psychology. And it describes original scientific research in which polygraph techniques which are known as comparison or control question tests were utilized to determine the extent to which such techniques can differentiate truthful and deceptive individuals in a mock crime scenario, which is the typical laboratory type of simulation that's done in this type of research, and the extent to which the

techniques can also distinguish among various roles that a person might play in a crime scenario, such as the actual perpetrator, a collaborator, and someone who's informed and knowledgeable in advance, or somebody who's innocent.

Q Uh-huh (affirmative).

A And this is a carefully conducted piece of research published in a journal that rejects normally about 80 percent I think of the manuscripts submitted for publication.

Q How can you tell if this article -- or first of all, was this article subjected to peer review?

A Yes, as a matter of fact, I was one of the peer reviewers and I required very extensive revisions twice before it was ultimately published, as did other consulting editors ask for revisions.

MR. McCOY: Your Honor, my request is that B be admitted.

MR. COLLINS: No objection.

THE COURT: B is admitted.

(Defendant's Exhibit B admitted)

BY MR. McCOY:

Q Dr. Raskin, I want to ask you to explain to Judge Roberts how it was that you initially became involved in the subject of polygraph examinations, as an issue of study for you.

A In 1970 I received a telephone call from an attorney in

Salt Lake City -- I was at the University of Utah at the time -- who told me he had been referred by one of my colleagues. And he was seeking my assistance because he had a client in a capital case who had taken a polygraph examination that was going to be introduced at trial, and where the polygraph examiner had reported him as deceptive. And he asked for my help in dealing with this, because I was a psychophysiologicalist. And I told him that I would be willing to look at the materials and tell him if I could help him. And when I looked at them I knew I could help him, because it utilized a technique that was well known to be useless, basically, in differentiating truth from deception, even though it was in widespread use at the time.

Q Uh-huh (affirmative).

A And so I did so testify at trial. And it got me interested in the problem, and I thought, well, this is unfortunate that techniques that probably don't work at all are being utilized. But we looked at the scientific literature and found there really wasn't any adequate research by bona fide scientists --

Q Uh-huh (affirmative).

A -- on these issues, even though they're being widely used by the government and then law enforcement areas. So I decided as a psychophysiologicalist, I would use the resources in my laboratory and my training to do research which I expected

would show that polygraph techniques don't work. But in the course of our examination of the literature we discovered that there were other techniques available that were becoming more widespread in their use, known then as control question tests.

Q Uh-huh (affirmative).

A Not the one that I had criticized in that trial, but another technique that was not well known to psychologists. And so we decided to research on that since that seemed to be the -- the method of choice as it was developing, both by the government and in law enforcement in general. And so we did research on that, which I fully expected would show that that didn't work either.

Q Uh-huh (affirmative).

A That was the general opinion of psychologists --

Q Uh-huh (affirmative).

A -- and psychophysicologists. Much to my surprise, it worked a lot better than we thought. Better than chance, not perfect, but reasonably well. And we published that study in the Journal of Psychophysiology in 1975. And it became quite an interest of mine. And I thought that, well, since these things are being used and they do seem to work, we should set about improving them. And I spent the next, well, up until today, so that's 29 years --

Q Uh-huh (affirmative).

A -- working on that problem.

Q As you probably know, Doctor, people often think of the polygraph as being synonymous with a lie detector. Is that accurate?

A I think that's quite a misconception. It's a -- an oversimplification of what a polygraph is. A polygraph technique is -- is a method for gathering information that might be used to make inferences about truth and deception, but the instrument itself does not detect lies. It simply measures physiological activity. And one has to have a protocol and a scientific basis from which to make inferences about truth and deception.

Q Okay. And during the course of the years since 1970, what did you learn about the efficacy of polygraph examinations?

A Well, I learned that there are some techniques that are better than others and some that are not useful at all, except perhaps for extracting confessions. The -- the latter being the relevant-irrelevant test --

Q Uh-huh (affirmative).

A -- which was the earliest type test, and didn't have adequate controls or comparisons in it to make a reasonable inference. That was the type of test that was used in that case that first got me interested.

Q Uh-huh (affirmative).

A But also learned that there are what are called control question or, properly, comparison question tests in which there are proper internal comparisons that are built into the test that allows one to make accurate inferences about truth and deception if the test is structured and conducted properly and if it's evaluated properly and if the recordings are made properly. And I learned that over the years as we worked on these problems and improved the methodology for the interview technique that precedes the -- the test, the question structures that are used, the types of questions that are used, the instrumentation, the analytic procedures, that one can achieve very high rates of accuracy.

Q All right. I want to move on and talk about your qualifications to actually administer a polygraph examination. Would you tell Judge Roberts what training you've personally received regarding the administration of a polygraph examination?

A Well, my training really begins with my work in psychophysiology, because that's the instrumentation, and my studies about human bodily processes. So that's the basic background combined with the psychology training that I've had as a undergraduate and graduate student in how to interview and interact with people. In addition, however, I undertook a training course at a polygraph school for polygraph examiners

in 1973 in New York City. I was invited by the director of that school, Cleve Backster, to attend his school free of charge, and I offered to teach part of his course for him in psychophysiology in return for that favor. And I attended this six-week training course which was designed to teach individuals how to run and interpret polygraph chart -- examinations. Mostly they're law enforcement or ex-law enforcement people, but I was the only academically trained person or scientist in the course. And so I underwent that and then I had to do an internship where I -- a supervised internship of 100 examinations by another polygraph examiner who at that time was my Ph.D. student, later Dr. Barland, went after his Ph.D. And so he supervised me in my internship. And I -- that was part of my training, and then I took the tests and so on to become licensed.

Q All right. How was this training different from other training you received in the academic areas?

A Well, it was not, strictly speaking, the kind of academic course that I've had over my career or that I've taught over my career, except for the polygraph workshops -- workshops I do. It was more designed as a practical, hands-on kind of course, where the basic scientific, psychological information is given to those examiners to the extent that they can understand it --

Q Uh-huh (affirmative).

A -- so that they can then conduct a polygraph test like technicians. It's more of a technical training course.

Q All right. And what was it that you learned that you weren't qualified to do before the training?

A I learned a lot about how to formulate the questions --

Q Uh-huh (affirmative).

A -- what some of the pitfalls are in formulating questions. I learned how to do what is known as numerical scoring of polygraph charts, using a system that Mr. Backster had developed and then later the U.S. Army had modified.

Q Uh-huh (affirmative).

A And then we've modified it based on research since. But I learned how to apply that. I learned a lot about the uses of polygraphs in -- in the field, in law enforcement and nonlaw enforcement applications, and some of the legal aspects relating to that. We had sections on those things. I learned a lot about interrogation.

Q All right.

A Well, not in that course so much, but in later --

Q Sure.

A -- interrogation courses I took.

Q Are you licensed to administer polygraph examinations?

A Yes, I am.

Q Tell Judge Roberts where you hold licenses to do that.

A I hold a license in Utah and in New Mexico. Both of those states have pretty stringent licensing requirements.

Q All right. Do you regularly administer these examinations?

A Yes, I do.

Q Would you quantify that for us, how many you do, how many have you done, that sort of thing?

A Well, since I started doing them in actual cases, which I think was about 1975, I've administered in excess of a thousand polygraph examinations, mostly in criminal cases. And last year I think I probably did about forty-some-odd examinations.

Q And how long have you been licensed by Utah and New Mexico to administer polygraph examinations?

A I believe I got my license in Utah in 1975, and in New Mexico, probably about 1978, I think.

Q Have you ever been approached and asked to train other individuals in the proper administration of a polygraph examination?

A Yes, I have.

Q Would you tell us about that, please?

A Well, for about 24 years, I think, I conducted a special workshop at the University of Utah for polygraph examiners, a more advanced polygraph course that incorporated the latest science --

Q Uh-huh (affirmative).

A -- and psychological principles, for people who are already polygraph examiners.

Q Uh-huh (affirmative).

A And that was initially a five-day course, and then we cut it down to three days because lots of those people couldn't come for five days.

Q Uh-huh (affirmative).

A And I did that for 24 years, and I had examiners from all over the United States, Canada, occasionally from Europe, occasionally from Japan, and a few other places, attending that course. Many -- the -- the majority of them would be federal polygraph examiners from all the different federal agencies.

Q I was just going to ask you, who was your typical attendee.

A Yeah. The typical attendee would be people -- polygraph examiners from the U.S. Secret Service, the CIA, the various branches of the military and the DOD, local law enforcement --

Q When you say DOD, you mean Department of Defense?

A Department of Defense, excuse me.

Q Okay.

A And, you know, all the branches as well as from the department itself, people from -- occasionally from the polygraph school that the government runs. And -- and occasional scientists who were interested, but more often, almost predominantly polygraph people. And then private

polygraph examiners who were in private practice.

Q Has any agencies, federal agencies or state agencies, asked you to consult about polygraph examination --

A Yes.

Q -- and polygraph examination technique?

A Yes.

Q Could you tell the judge, Judge Roberts, who you've been asked to consult with or conduct polygraph examinations for the government agencies?

A Well, I've done consulting and/or polygraph examinations for the Central Intelligence Agency, the FBI, the U.S. Secret Service, the Secretary of the Treasury, U.S. Department of Customs, Alcohol, Tobacco and Firearms, Drug Enforcement Administration, U.S. Department of Energy, the various U.S. Air Force -- forgetting the acronym now -- the Office --

Q CID?

A -- of -- Office of Special Investigations, OSI, Criminal Investigation Division of the U.S. Army, Naval -- whatever the Navy is now, I've forgotten.

Q Okay.

A Naval Investigative Services, NIS. I've consulted with National Security Agency --

Q You ever been asked to consult by the -- with the U.S. Department of Justice?

A Yes, I have. I've done work for U.S. Attorneys, both polygraph examinations and evaluating other polygraph examinations for them. I'm currently retained by the U.S. Department of Justice in Washington, D.C. to work on a rather important case that they have and was just recently approached by another U.S. attorney in the Department of Justice to consult with them on another very high-profile case.

Q Any foreign governments approach you and ask for consultation and advice in the proper administration of polygraph exams?

A Yes. I have done extensive consulting for the Israel Police on a number of occasions in Israel, training and consultation, the Israel Anti-Terrorism Forces. I was brought over to do a special three-day training for their polygraph people who conduct examinations in their anti-terrorism activities, as -- often referred to as the Secret Service over there, but it's different from our Secret Service.

Q Uh-huh (affirmative). Uh-huh (affirmative).

A I have also done extensive training and consultation for the Royal Canadian Mounted Police and the Canadian Police College. I taught regularly in their course for -- from its inception in from 1979 until last year, when I just got tired of traveling all the way to --

Q Uh-huh (affirmative).

A -- Ottawa. It's too far to go from Homer. And I have also consulted with the Court of Appeals in Sweden. I've done training in -- in NATO conferences and in Europe, NATO scientific conferences. I've done training for the Japanese National Police and I've also done consultations for other foreign bodies such as the Israel Supreme Court, the British House of Commons, as well as United States Senate.

Q With regard to the United States Senate, could you describe for Judge Roberts when you've been asked to consult with the United States Senate and over what matters?

A Well, I've served as an expert on a number of occasions. I think the earliest was when I was asked by Fred Thompson, the minority counsel on the Watergate hearings, who's now a United States senator, to consult with him about doing polygraphs in the Watergate investigations. He wanted me to polygraph John Dean, but Senator Ervin said no.

I also was consulted -- I served as an expert witness for Senator Birch Baye (ph) of Indiana, at hearings of the United States Senate Judiciary Committee on proposed legislation to limit the use of polygraphs in the private sector. I was retained by the -- by Senator John Kerry of Massachusetts, who co-chaired a subcommittee of the Senate Foreign Relations Committee investigating the Contra drug issues that came up about alleged funding of drug money from Colombia and drug

cartels to the Contras during the Contra and Nicaraguan efforts. And I did very sensitive polygraph work for Senator Kerry for the committee in that consultation.

And I also served as the expert for the Senate Labor and Human Resources Committee, at the request of Senators Orrin Hatch of Utah and Senator Edward Kennedy of Massachusetts, as their expert in assisting in the drafting and then testimony with -- regarding the bill to -- which is known as the Polygraph Protection Act of 1988, I believe, which limits the use of polygraph examinations in the private sector.

Q All right. Would that be employment screening, that kind of thing?

A Employment screening, yes. It basically makes that kind of activity illegal.

Q All right. Have you testified as an expert witness before in courts?

A Yes.

Q Would you tell Judge Roberts how many times you've testified as an expert witness in courts?

A In excess of 200 times.

Q All right. And how many times has your testimony been focused on polygraph issues?

A I would say approximately 150 or a little more than that.

Q All right. And would you identify generically the courts

that you testified in as an expert witness?

A I've testified in federal courts in a variety of jurisdictions around the United States as well as federal court in Canada and in Sweden. I've testified in state courts all over the United States. And I have testified in, you know, local courts and various special kinds of bodies, like employment commissions and things like that.

Q All right. Have you testified before juries before?

A Yes, I have.

Q How many times have you testified before juries on polygraph issues?

A I think approximately 50 times --

Q Uh-huh (affirmative).

A -- in front of a jury at trial.

Q All right.

MR. McCOY: Your Honor, at this time I'd offer Dr. Raskin as an expert in the field of psychophysiology and the administration and interpretation of polygraph exams.

MR. COLLINS: No objection.

THE COURT: So admitted.

MR. McCOY: Thank you.

BY MR. McCOY:

Q Dr. Raskin, I want to start with a -- our discussion about the *Daubert* factors here in a minute. You're familiar with the

Daubert decision?

A Yes, I am.

Q Okay. What I want to start with is to talk about the scientific bases for polygraph examinations. Would you please explain to Judge Roberts the psychophysiology that is the scientific basis for the polygraph examination that was administered in this case?

A Yes. The type of examination administered in this case is based upon certain fundamental psychophysiological principles that there are certain bodily reactions that are involuntary that occur almost invariably in most individuals when certain stimuli or psychological states are present, and that one can measure those reactions with proper instrumentation. And that when a person is faced with a threatening situation, a physically or psychologically threatening situation, these involuntary reactions which are mediated by what is known as the autonomic nervous system -- so through the brain and then into the peripheral nervous system -- these reactions express themselves in the kinds of activity that we can record with a polygraph, such as changing in respiration, suppression usually of respiratory activity, increases in sweat gland activity on the palm of the hands, known as skin conductance responses or galvanic skin response, increases in blood pressure and decreases in the amount of blood on the surface of the body

caused by constriction of the peripheral blood vessels.

These and many other kinds of things can be measured when a person is threatened. And a polygraph examination utilizes those well-established, undisputed physiological reactions to construct a psychological protocol designed to minimize the number of possible explanations for why particular reactions may be observed in a controlled situation such that one can narrow it down to an inference about whether or not a person was engaging in deception or telling the truth --

Q Is this --

A -- when they answered certain questions.

Q Is this related to what I know as the flight-or-fight -- flight reaction?

A Yes, it is. The fight-or-flight reaction which is commonly referred to -- the most frequently used example, interestingly, has to do with what William James said about encountering a bear on the trail --

Q Uh-huh (affirmative). Uh-huh (affirmative).

A -- which I'm sure James never did, but some of us have. And that causes an involuntary reaction and these things can be measured. The same kind of a thing, although in a lesser form because it's not the same kind of fullblown fear, but it's an intentional arousal process, occurs when a person is threatened with discovery if they are being deceptive and if they are put

in a situation where they feel that their deception may be detected. And it's that kind of psychological fight-or-flight that provokes similar types of reactions.

Q So nonphysically threatening situations can trigger psychophysiological reactions, is what you're telling us?

A Yeah, just like when I get on the witness stand every time, I feel anxious --

Q Uh-huh (affirmative).

A -- no matter how many times I do it. It's a threatening situation, it's not pleasant.

Q Uh-huh (affirmative).

A And it produces similar kinds of reactions.

Q Are the functions that we're talking about here, the increased respiration, blood pressure, perspiration, that sort of thing, these things that you've described, as they recognized as valid principles of psychophysiology?

A Oh, yes. They're not disputed in terms of the basic principles that I just laid out. The dispute might come in in terms of what you can use those measurements for, but in terms of the process that causes them, that's --

Q Yeah. So these -- have the -- has scientific testing and scientific study established these principles beyond doubt?

A No question about it. They've been pretty well established since the early part of this century.

Q Okay. Were you familiar with the *Frye* decision?

A Yes.

Q All right. Could you trace the history and evolution of polygraph examinations since *Frye*?

A Yes. The *Frye* decision came out of the D.C. Court of Appeals in 1923. And at that time the issue was whether or not the principles are generally accepted. Since that time there's been a great deal of scientific -- excuse me -- scientific research about polygraph techniques. There's about 100 years of accumulated research, and the vast majority of it having been done since about 1970.

Q Uh-huh (affirmative).

A And the -- during this period of time, first was the relevant-irrelevant test that was developed actually at Harvard University by a psychologist named Marston (ph). And that is a technique that was widely used and developed more by law enforcement people, John Larson (ph), a medical student at Berkeley --

Q Uh-huh (affirmative).

A -- with the Berkeley Police Department, and Leonard Keeler (ph), who worked with him. And Keeler made it very popular and worked on some high-profile cases using this relevant-irrelevant technique. The problem with that technique was that it asked only relevant questions: "Did you shoot the doctor,"

which is the case of --

Q Uh-huh (affirmative).

A -- *Frye*; and "Do you live in Washington, D.C.? Is today Tuesday?" And the idea there was, if a person is lying, they'll have big reactions to the "Did you shoot the doctor" question and relatively small to "Is today Tuesday," whereas if the person's telling the truth, the naive notion was that they won't show much difference in reaction to the new questions, because they're not lying and therefore they won't have this automatic --

Q Uh-huh (affirmative).

A -- reaction. But that was based upon a gross lack of understanding of human psychophysiology.

Q Has it been discredited?

A It has been thoroughly discredited, although there's still a few people who still use it. Even the FBI uses it occasionally.

Q Uh-huh (affirmative).

A But it has been discredited and replaced by what are known as comparison question tests, or more commonly known as control question tests.

Q Would you tell me how it was that the comparison question test was developed? When did that start to occur?

A Well, that started in the late '30s. A psychologist at

Fordham University by the name of Father Summers (ph) decided that he needed to have a proper comparison, something that an innocent person would be more likely to react to than the relevant questions if they're telling the truth on the relevant question. He called these the emotional standard question.

Q Uh-huh (affirmative).

Q And this was designed to get the innocent person's attention and produce a big reaction that would indicate they're really not as bothered by the relevant question, the one about the crime. And that was taken by John Reed (ph), a lawyer in Chicago, and developed into what he called the control question test. He worked with Professor Fred Enbow (ph), the famous criminal law professor at Northwestern University, and they wrote books together on this. And he developed what is known as the control question test, which utilizes what's known as a probable lie question in which the examinee is led to believe that you need to assess their basic character as well as to find out not only did you shoot the doctor --

THE COURT: Excuse me, just a moment. Mr. Powers, did you need to see me? Did you need to see me?

MR. POWERS: No, Your Honor.

THE COURT: There's a document for you in the chambers. You can call for it.

MR. POWERS: Thank you.

MR. McCOY: Let's see.

THE COURT: I'm sorry, please continue.

THE WITNESS: That's all right.

BY MR. McCOY:

A In addition to the question about, "Did you shoot the doctor," it was felt that you needed to have a question such that if a guilty person is lying to the "Did you shoot the doctor," that would still be the most threatening question and would show the biggest reaction. But for the innocent person, that accusation is also a very provocative stimulus. All of us, if accused of something like that, would have some reaction to it, particularly if it's the only important question.

Q Uh-huh (affirmative).

A So Father Summers and then John Reed realized that if you didn't have something else, the innocent people would also look deceptive. That's the problem with the relevant-irrelevant.

Q Uh-huh (affirmative).

A So what they did is they constructed what they call a probable lie question. And it was done and introduced to the person as sort of a basic character question, to make sure that they weren't the kind of person that would do the thing of which they're accused. So they would be asked, "You know, John, you know, sometimes people hurt people and so on, but

you're not the kind of a person who would do that, are you? You wouldn't just hurt somebody, just, you know, to hurt them or whatever," and you sort of maneuver the person into a defensive posture with regard to that topic and say, "So if I asked you a question, during the first 30 years of your life, did you ever hurt or harm someone, you could answer that 'no,' couldn't you?" And the average subject is sort of put off and so -- "Oh, yeah, I -- I -- I wouldn't do that, I'm not that kind of a person." "Well, good. Because we need to establish you're not that kind of a person."

And then questions like that would be included along with the relevant questions. And then when asked this, the underlying hypothesis of the comparison question test, if you're lying on the "Did you shoot" question, that's going to be the most threatening question. It will have the biggest reaction and you'll look deceptive on the test. But if you're telling the truth on that and if it's explained to you that you only react when you're not being truthful, then you sit there and think, hmm, what's it going to look like when I say "no" about ever hurting someone. Gee, you know, I -- I remember I hurt my parents when I got in trouble the time that I took the car when I wasn't supposed to and I was drinking when I was younger and -- you know, and so on.

Q Uh-huh (affirmative). Uh-huh (affirmative).

A And so, you know, begin to wonder, well, is that going to show up on the test. And they would begin to worry about that and worry about failing the test because of that question, which when it shows the largest reaction to that question, it indicates that they are more concerned about something trivial like that in their past than about the serious thing of which they're accused now. And so the truthful person should show a stronger reaction to the comparison question. And that has become the method of choice and that's the type of research that we've been doing for many years which has shown it to be a highly accurate technique.

And then since that time, in the more recent years, starting the mid-'80s, there began the development of a different type of comparison question called the directed lie --

Q Uh-huh (affirmative).

A -- which is a more simple and straightforward way of producing a competing question. And in that situation the person is told, "I need" -- told much more directly up front, much less manipulation than of the sort I just described. In fact, some people refuse to answer those probable lie questions, because they can be very intrusive, particularly in government work. The government's --

Q Uh-huh (affirmative).

A -- very concerned about that. And so my colleagues and I took some ideas that were originally developed in military intelligence by a man named Lou Fuse who worked for military intelligence, who developed what was called the directed lie. And we took that and refined it and made it simpler and more straightforward. And -- and in this situation now, instead of manipulating the person, like with a probable lie, and hoping that they're lying about that question -- that's why it's called a probable lie -- we build in what we know is a lie, and it's a very simple thing. And we tell the person -- first we run a demonstration test with numbers, have them choose a number and tell them to lie to it. When we ask about the numbers that they chose, they're to say "no" to every number. And then they'll be lying on the number they chose and telling the truth on the others, and they are told, "This is important to establish your pattern of reaction, when I know you're lying and when I know you're telling the truth." And then I can use that information to interpret the main test. Then you run that number test with them. Then you say, "Okay, now, on this test," and you review the -- the questions on the actual test and you review the relevant questions, and then you say, "On this question -- test, I also need some questions that I know you're lying to and ones I know you're telling the truth to, so I continue -- can continue to see that you show a difference in

your reaction when you're lying, when you tell the truth, and I can use that difference to interpret the reactions to the questions about the shooting or the theft or whatever it is." And then you ask those questions and they're instructed to lie. And then you -- the questions are simple things like, "During the first 30 years of your life, did you ever make even one mistake? Everybody's done that. You've done it, I've done it. So I want you to answer 'no' to that. Think of a time you did it. Don't tell me what it is, I don't really care. But think of when you did it so you know when you answer that question, you know you're lying. Then I'll see your reaction when you're lying and then I'll be able to compare it to the reactions about the shooting or the theft to see if that's the same or different."

And then again, you set up a competition there such that if the person's lying about the important issue, the thing of which they're accused, that would be the most threatening question, it'll have the biggest reaction. But if they're not and they're telling the truth when they say, "I didn't do that," now they become concerned that their lie will show up clearly on the directed lies, so that you'll know they're telling the truth on the relevant question because that will look different.

Q And we're going to talk about directed lies further on, but

right now it's enough to say -- and correct me if I'm wrong -- that the directed lie technique has been subjected to scientific study and peer review?

A Yes, it has.

Q All right. I want to back up for just a minute. You mentioned something about the FBI using the relevant-irrelevant test which you've indicated is discredited. Why has the FBI used the relevant and irrelevant test?

A Well, one of the things about the relevant-irrelevant test is it allows flexibility.

Q And is it an interrogation tool?

A It's an interrogation tool. Almost everybody will show reactions to those relevant questions. So if you want to confront somebody and say, "You're lying," you're going to say, "You got these big reactions to these questions."

Q In fact, have you seen cases where a relevant-irrelevant test was used precisely as an interrogation tool to attempt to elicit an admission --

A Oh, yes.

Q -- or a confession?

A I've seen that on many occasions --

Q All right.

A -- including in court, with an FBI presentation in federal court at trial.

Q All right. But that's not what we're talking about here today?

A No.

Q All right. Dr. Raskin, I'd like for you to talk about how the polygraph exam is administered. Could you begin by describing the instrument that's used to conduct the examination and describe for the Court so we have an understanding of what it is.

A Well a typical polygraph instrument has at least three physiological measures. Normally two measures of respiration made by attaching a transducer around the -- excuse me -- the upper chest --

Q Uh-huh (affirmative).

A -- and the abdominal area, what we call thoracic and abdominal respiration or upper and lower pneumograph; it's another term that's used. And that records every time the person inhales and exhales. It provides a continuous tracing that's recorded on a moving chart or in a computer, if you have a computerized polygraph, which is rapidly becoming the standard. And you have that measurement of respiration. In addition, you measure sweat gland activity off the surface of the palm, typically by putting two pickups on the palmar surface of two fingers.

Q Uh-huh (affirmative).

A And in the better instruments, it uses a contact medium like elect- -- the EKG gel --

Q Uh-huh (affirmative).

A -- that we're familiar with to make contact with the skin. And you can record the amount of sweat gland activity in the skin continuously. And when a person reacts, their -- the conductivity of the skin goes up and that tracing be -- rises.

The third psychophysiological measure that's used on all these instruments is a measure of relative blood pressure. This is obtained by putting a standard blood pressure cuff on the upper arm usually, inflating it to about 50 or 60 millimeters of pressure, and leaving it at that during the questioning sequence. And when a person reacts, this shows not only each heartbeat, but when there's a reaction the blood pressure rises and the tracing rises.

Q Uh-huh (affirmative).

A And then some instruments also include what's called a finger plethysmograph, which is a little device put on the finger that can measure the redness of the finger. And when we react in that system, the amount of blood in the surface of the finger decreases. We get pale when we get anxious, on our face as we get that way, all over our body. But the finger is very sensitive and we see a decrease in the size of the pulses obtained from the finger. So that's the fourth measure.

And these are measured continuously, either on an inked chart with pens, which is the more traditional way, or more recently on a computer, where it's recorded in the computer memory and displayed on the screen and can be printed out later on in the form of a printed chart.

Q And what kind of instrument do you use, sir?

A I use a computerized system that was developed in my laboratory at the University of Utah, manufactured by the Stolting (ph) Company, and it's known as the Computerized Polygraph System, or CPS.

Q All right.

A And -- and then I think the rest of your question was, how is the test conducted. Well, you -- you use the instrument, and it's only employed in part of the examination. The examination is a fairly lengthy procedure, usually taking an hour and a half to two hours, sometimes longer depending on the complexity of the situ- --

Q Why don't take a few minutes and actually describe a full examination.

A Okay. They vary somewhat according to the examiner, but the standard procedure that I and many others use is, we begin by getting a formal consent to take the examination. In fact, where I'm licensed, you're required to get a subject's written consent to take the test. I give them a full *Miranda* type

warning, explain to them basically how the test is conducted in general and tell them I'll explain in more detail as we go through. It also incorporates what they're accused of and that, you know, they -- they consent that they will take the examination, that it could be used as evidence against them in a court of law, and they sign a release for me to provide the results to whoever requested the examination.

Once that is done, then there is background information obtained from the person: name, you know, address, age, things like that, educational and health history, psychiatric history and medication, all of these things are inquired into, hours of sleep, to make sure that the person's a suitable subject and also to get them sort of -- somewhat more relaxed in the situation, because everybody's extremely anxious when they take these tests. Whether they're guilty or innocent, they are extremely anxious. And it doesn't matter whether it's a major crime like a murder or a minor crime like a small theft or shoplifting. Everybody's anxious. And so you need to get their anxiety level down to a manageable level. And part of this is done by talking with them and having them talk about themselves, the subject with which they're most familiar.

Q Uh-huh (affirmative).

A And so they tell you about themselves, and you've established some rapport with them. And then the next thing

after getting that information is to discuss the case itself. So what I normally do is say, "Okay, now, I understand you're accused of X, Y, and Z." And I go over with them what the specific allegations are, usually based upon police reports, an indictment, you know, whatever the specific allegations are. And I tell them, "This is my understanding of what you're accused of, and I'd like you to tell me from your perspective everything you think I need to know." And then I have them tell their version of it, and I also ask questions as we go along to clarify things. I'm never confrontive at this point, because confrontation destroys the integrity of the test.

Q Uh-huh (affirmative).

A So this is a way of drawing them out, letting them tell their side of it, making sure you understand the issues from both sides, so that the questions address both concerns: the concern of the accusation as well as the concern of the accused; so that the questions are clear, straightforward, the relevant questions unambiguous and go directly to the issues, and that all can be answered with a simple "yes" or "no." All questions must be answered "yes" or "no." And so this is a lengthy discussion.

And then tentative questions are formulated. I normally have the questions all written out before I even come in there.

Q Uh-huh (affirmative).

A But I go through this process with the individual. And sometimes they're modified, depending upon what the person tells me, because there may be something that's not incorporated that is ambiguous. So you have to modify them to take care of both sides of the issue.

And then after that is done, then I explain to the person how the polygraph works, give them a brief description of the fight-or-flight, why they react when they lie, why they react -- don't react when they tell the truth, and then I tell them, everybody's body is different; just as we all look different, we have the same parts but they vary, size, shape, and color, and so on. The same is true of our internal mechanisms; we have the same systems, but everybody's activity and reactivity is a little different. So I need to get that instrument adjusted to get clear recordings from them and also to see exactly what their pattern of reaction looks like when I know they're lying and when I know they're telling the truth. Then I explain the number test to them. I have them choose a number, tell me what the number is, and -- oh, and by the way, I've attached the polygraph at this point. After the discussion of the questions and so on, attached the polygraph and then we do the number test.

And then I do the number test with them. I know what their number is, they know what their number is, and then we run the

test to see what their reactions look like. Plus I use that to -- to adjust the instrument. And then after that I say, "Well, that's" -- I usually say, "That's nice and clear. I can see what your reaction is when you're lying and it's different from when you tell the truth," which is usually the case. If it isn't the case I just say, "I can see your reaction when you lie and when you tell the truth." I don't -- I don't misrepresent anything to them. And they can interpret whatever that means. We never show them the charts --

Q Uh-huh (affirmative).

A -- unless they want to see them after the exam's done. And then I say, "Okay, now we're going to go over the questions that I'm going to ask you on the test, word for word. You'll know exactly what they'll be."

Q These are the questions you've already reviewed?

A Well, I've only partially reviewed --

Q Uh-huh (affirmative).

A -- just the relevant questions.

Q Uh-huh (affirmative).

A Now I'm going to review the full set, because in a test such as the one I did in this case, there are 11 questions typically, four relevant questions, one what we call a sacrifice relevant that appears early in the test that's never evaluated, just an overall question about the accusations, "Are

you going to tell the truth," and then it usually includes three comparison questions, in this instance, directed lie questions, and a couple neutral questions.

Q Uh-huh (affirmative).

A "Is your name so-and so?" "Were you -- do you live in the United States," or "Do you live in Alaska?" And then I review those questions and they're told to answer "yes" or "no"; if there's anything unclear, tell me about it, we'll discuss to make sure they're clear and that you feel comfortable answering just "yes" or "no." And then I -- then we get to -- through the relevant questions and then I say, "Okay, now, on this test you have some questions that I know you're lying to and ones I know you're telling the truth to, so I can continue to see the difference in your reactions, so I can use that to interpret the test." And then I say, "Okay, so I want you to lie to these next three questions." And then I -- these are things everyone has done and so on, and I have them then answer "no" to three directed lie questions. They're -- "During the first 30 years of your life," say if the incident occurred after they were age 30, "did you ever make even one mistake; did you ever violate a rule or regulation," questions like that, and a couple neutral questions: you know, "Is your name such-and-such," "Do you live in the United States?"

And then I say, "Okay, now we're going to go over those

questions several times." I don't tell them how many. "And what I want you to do is just answer 'yes' or 'no' to each question. Keep in mind something on the direct -- now, there's questions I want you to lie to, so you know you're lying when you answer 'no.' Answer truthful to all of the other questions. And we're going to go through these several times, they'll be a slightly different order each time, all the same questions."

Q And this is talking about running a chart?

A That's running what we call a chart.

Q Uh-huh (affirmative).

A One time through the question sequence. And then after that's done I say, "Okay, how was that? How did you feel?" We discuss that. I say, "Do you have any problems with any questions?" I want to make sure that there's nothing ambiguous, because if they wait until the end to tell me and there's something that was a defect in a question, we may have to redo the test.

Q Uh-huh (affirmative).

A So I want to make sure that they feel comfortable answering "yes" or "no." And then -- and I say, "Well, what about the questions about the theft, the money, you know, any problem with those?" And usually they say no -- excuse me -- no. Although they might say, "Well, I felt really nervous every

time you asked those." That's a common response. And I might have to say, "Well, don't worry about that. That general nervousness will go away if you're telling the truth. If you're not telling the truth it'll get worse. But you just concentrate on whether or not you're telling the truth." Then I say, "And about the questions I asked you to lie to, you knew you were lying when you answered 'no' to those?" "Yes." "Did you have something in mind?" "Yes." "Okay, good, that's important. Be sure you have something in mind." And then I say, "Okay, are you ready to go through them again?" Go through them a second time. Same procedure a third time.

And then I normally stop after three and I do a numerical evaluation of the charts. I say, "I need to look at these now to make sure the recordings are clear, to make sure that they're good quality, so it's going to take me 10 or 15 minutes. Just relax while I do this," or sometimes they go use the restroom, or whatever. And I then do a numerical score. If the results are clear, either clearly deceptive or clearly truthful, at that point that's the end of the test. If they're not, if they're marginal one way or the other, I then run two more charts typically, and then -- and I tell them I need to run a couple more and do a couple more. Or if there's some technical difficulties that made some chart unusable, you know, I have to run more to get enough. I need to have at least

three usable charts. And then after two more, then we're done. And then I numerically score the charts, and usually at that point it's a clear truthful or clear deceptive result.

If it's not conclusive, then we're going to have to talk and see if I can figure out why it is that the results aren't clear and if we can run another test that might clear it up one way or the other. Sometimes I just give up and say I don't see any way to -- to make this any clearer. Sometimes it's something that's just so confused in the person's mind that you can never disentangle them.

Q All right. And how long does this process typically take, sir?

A It normally takes anywhere from an hour and half to three hours. Hour and a half to two hours is typical, if it's a straightforward situation. It may be longer if it's complicated. I've had one, sometimes it's taken me five to six hours, and maybe had to run two or three different tests depending on the situation. But that's unusual.

Q Okay. We have been talking for several minutes now about the comparison question method, and you've touched on directed lie and probable lie. Could you please describe the differences between those two?

A There are a few fundamental differences. The probable lie question maneuvers a person into answering "no" to a question

to which they may be withholding --

Q Uh-huh (affirmative).

A -- information, for the purpose of creating a potential concern during the test for the innocent person. So you have to maneuver them to answer "no." And you have to assume that they are likely lying or not sure they're truthful when they answer "no."

Q Okay.

A The directed lie, by comparison, instructs them to lie about something trivial so that you know that they are lying, they know they are lying, and you explain to them that that is used to see what their lie reaction looks like, so you can interpret the test.

Q Right. And these are two different methods of administering a comparison question test?

A Correct. The directed lie is a refinement, a psychological improvement over the probable lie.

Q Okay.

A Because it's straightforward. We know that the person's lying. There are no games played, no maneuvering, and it has what we call face validity, which --

Q Well, did -- I gather you're telling us that the directed lie technique is preferable?

A Oh, I think it's definitely preferable. I think the

research shows that. And psychologically, when you do a psychological analysis it's preferable because the person can understand why it is that you're asking these questions. They are not suspicious like they might be with a probable lie, you know they're lying. And as I was about to say, it has face validity, which is a very important characteristic of any psychological test. Because the person not only understands, but they can see how this is used to determine if a person's telling the truth or not. So they can see that the test probably measures what you say it measures. Whereas with a probable lie, it has not as clear face validity. It's weaker in that regard.

Q All right. In other words, with a directed lie, you're comparing a relevant question, the one that you're testing on, with a directed known lie?

A Correct.

Q And with a probable lie technique you're using a probable lie, a hoped-for lie, something you're speculating is a lie, with a relevant question?

A Right. And also, you don't know what -- how the person's evaluating that question. I mean, it could be anything in their mind, and we just don't know. It's somewhat unknown, and it requires manipulation.

Q All right. Just have a few questions about the comparison

question technique in general. Does it address nervousness, take into account nervousness?

A Yes, in general it does. If there is general nervousness, that is expressed throughout the polygraph recordings. What we're looking for are specific reactions. And general -- excuse me -- nervousness, you know, pervades the whole test. However, if a person is just highly emotional about the relevant questions, whether they're telling the truth or not, that is a weakness of any test --

Q Uh-huh (affirmative).

A -- and that's probably where the small percentage of errors come from.

Q All right. Is it important when you're using the directed lie comparison method to administer a polygraph exam to repeat the series of questions several times?

A Yes, it is.

Q And why is that?

A Because if you do them only once, you don't have a really reliable estimate of their reactions, because the physiological reactions that we're measuring are very complexly determined. They vary from moment to moment, for a variety of just simply biological reasons, and also things, you know, pop into people's heads at times that may provoke reaction or they may feel a little uncomfortable, or, you know, something may happen

such that you might get a -- well, it's a spurious reading, or noise.

Q Uh-huh (affirmative).

A The recordings have biological and psychological noise in them. And so you repeat them several times such that you expect, like any scientific evaluation, that the noise is random and it will cancel each other out. And what you're left with is the true signal, to use engineering analysis. Just as if you're testing materials, if you're looking -- testing the strength of a piece of steel in terms of its sheer strength or something like that, you just don't take one piece and test it once. You take a number of samples, because the one sample you got, there might have been something a little peculiar about the way that piece of metal cooled or about the way the equipment operated, and so you take several measures, just as -- if you've got one of those old bathroom scales, if you don't have the electronic ones that are pretty stable -- I can't get mine to give me a different number, unfortunately --

Q Uh-huh (affirmative).

A -- but if you've got one of those mechanical ones, every time you step on it, the reading's just a little different. So if you get on and off two or three times or four times and you average those, you're more likely to have the true reading.

Q Is there a minimum number of charts, if you will, that

you'll run?

A Three charts seems to be a minimum by industry standards. The Backster School teaches two charts, but the research indicates three, the government people advocate a minimum of three, we use a minimum, three. And all the research that we have done is based upon a minimum of three charts for the scoring.

Q Is there any difference of significance in the results between a first chart, say, and a last chart? Is there any significance to those variations that might occur, if they do?

A Well, there's no significance. If, you know, the first chart's the clearest or the last chart's the clearest, I mean, that's what it is. In general, there is a progression that reactivity tends to diminish over time --

Q Uh-huh (affirmative).

A -- although that isn't true for everybody. Some people are more reactive later on, or they're too reactive to everything to begin with and then it differentiates. All patterns are possible, and that's why you need to have several.

Q Yeah. What, if any, significance is there between variations between one chart and another regarding the physiological -- psychophysiological components?

A There's no fundamental significance other than, you know, that sort of noise and that's why you have to have three charts

or more to get a stable reading.

Q Not to run this into the ground, but is there a significance between variations that occurs between one and a -- chart and another as to the relative size of the reactions that you see?

A No. It -- you don't compare or cross charts, because you have a -- often --

Q Okay.

A -- a systematic change in size across charts. What you compare is within charts.

Q Okay. Now, what we've been talking about so far this morning is whether or not the polygraph is based on a scientific method; and I understand you to be saying yes.

A Yes.

Q All right. I want to turn to *Daubert*, and specifically whether or not you're familiar with the *Daubert* opinion?

A Yes, I am.

Q And you know that *Daubert* requires us to inquire or requires Judge Roberts to inquire into whether or not the scientific method has been scientifically -- testing?

A Yes.

Q If -- all right. What I'd like to do now is talk about the scientific testing that you're aware of that the polygraph examination has been submitted to. What do you -- what can you

tell us about the theory of the comparison question technique in terms of testing for validity and reliability?

A Probably more than you'd ever want to hear, but -- the -- these techniques have been subjected to a large number of scientific tests, which generally take two forms: laboratory tests and field tests.

Q Why don't we briefly talk about what a lab test is.

A The laboratory test is an attempt to recreate the crime investigation situation in a controlled setting, so that unlike the field, where when you run an actual polygraph test, it's a little difficult to know in a lot of cases whether or not your test is correct.

Q Uh-huh (affirmative).

A You have to have a trial to determine whether or not a person's guilty or innocent, and that's sometimes a little difficult too. So there are problems in the field of that sort. The laboratory -- and also, you don't have control over all the variables. Every --

Q Uh-huh (affirmative).

A -- case is different, every examination is different, and -- and so on. Every person's different. So in the laboratory you're trying to get control. That's the virtue of laboratory science. And of course, all science operates by using laboratory simulations as well as testing things out in

the natural setting.

And so in the polygraph situation we often use what's called a mock crime or a --

Q Uh-huh (affirmative).

A -- mock scenario, which is a simulation.

Q Could you give us an example how something like that's constructed?

A Yes. It's constructed to try to mirror the real life situations. So in a -- what we've often used as a theft situation, since it's relatively easy to set that up, what we do is we recruit subjects normally from the general community, sometimes prison populations, sometimes college students, depending on the purpose.

Q Uh-huh (affirmative).

A Most of our studies have been done, a lot of them, with people from the general community and some with prison populations. And we determine in advance that some of the people are going to be, quote, guilty. They will engage in this simulated crime --

Q Uh-huh (affirmative).

A -- and then lie about their involvement in it. And other people will be, quote, innocent. They will not engage in the simulated crime and they'll be told to just tell the truth when they deny it. Everybody's told to deny it. And then -- and

this is done, people are assigned at random to different conditions, so this is proper scientific procedure. And the assignment of subjects to guilt or innocence is done by people independent of the polygraph examiner. So the polygraph examiner who's going to run the polygraph charts --

Q Is blind.

A -- is blind, to use the -- the term, or he is totally uninformed as to who's guilty, who's innocent, or that's -- you know, if we're training some people in counter-measures, who's been trained and who hasn't and so on. And then the guilty people enact a scenario according to a script, and the innocent people are just told about what the guilty people did, just as anybody would be when they're accused of a crime they didn't do, and everybody's told to come in and deny it. And they're going to be given a polygraph test after they do this, and they -- they -- some have done the theft. And then they're also given an incentive. We usually use money --

Q Uh-huh (affirmative).

A -- which is a good incentive, it gets people motivated. And so in addition to being paid for their time, they are told they can earn a bonus if they pass the polygraph test. The guilty people want to pass, the innocent people want to pass. And -- like in real life.

Q Uh-huh (affirmative).

A And so they're told they'll earn this bonus. And the bonuses we've used have been up to \$500.

Q All right. And so then you have the mock crime and then the tests are run, and that's how you do a lab study?

A Yeah. Then they're brought in for their polygraph, a standard polygraph test is done using standard procedures like we were just talking about, same way that I just described, evaluated in the same way. The examiner makes a decision, reports it, does a numerical evaluation, submits that, and then that is later compared to the true status of that person to see whether it's correct or not.

Q Uh-huh (affirmative).

A Then the data are all analyzed. We often give people questionnaires afterward to find out what their feelings were about different aspects of it, to assess the psychological impact of different types of questions and so on. And that's basically how the -- the laboratory --

Q Okay.

A -- type is done.

Q What I'd like to do is contrast that with the field study and have you explain to Judge Roberts how a field study is constructed so we have that to compare to --

A Well, the -- the basic limitation of a laboratory study, which requires field studies, is that it's not the actual, real

thing. It may come close. In fact, we've done studies that show that psychophysiological, they are very similar. But you want to ultimately test this in a real life situation. The problem in real life, as I said before, is verifying whether or not your result is correct. So a person comes out deceptive or comes out truthful in the actual criminal accusation, is that correct? Well, if you knew for sure to begin with, probably wouldn't be running a test, except maybe to get a confession.

Q Uh-huh (affirmative).

A So in most instances, it's somewhat difficult to find out. So what you do is you have to develop a criterion of what we call ground truth. In the laboratory we know ground truth, because they were assigned to guilt or innocence. In real life we don't know ground truth initially, but one of the best ways to do that is to take cases where a person has subsequently confessed and had taken a polygraph. Now, if that person took a polygraph and then confessed, that's a verified guilty person. We can then go back and see whether or not the polygraph was correct. We can --

Q So what you've got is you've got a case that's already done, you've got a polygraph admitted and then a confession, and that's how you evaluate the --

A Right, that it was administered previously --

Q Got it.

A -- to the confession. Also, you have other people, because there are many cases where people other than the guilty person took a polygraph --

Q Uh-huh (affirmative).

A -- and later the guilty person was apprehended and confessed, thus exonerating somebody else who took a polygraph.

Q Okay.

A And in those instances then, you can independently verify innocent people. Then you go through records. We did a big study with the U.S. Secret Service, Dr. Honts and Doctors Patrick and Iocona (ph) did big studies with the Royal Canadian Mounted Police of this sort. We go back retrospectively through records to find cases that will satisfy those criteria. In addition, we look for other evidence, so in our Secret Service study we also required that the confessions be corroborated by independent evidence.

Q Okay. We're going to be talking about those in a few minutes.

A Yeah.

Q Tell me what "validity" means in the scientific world.

A "Validity" in the scientific world means what is often used -- meant by the term "reliability" in the legal world.

Q Okay, don't do that to me. What -- what's --

A Yeah. Well, I say that because we don't want -- we don't

want to be confused, because the --

Q Right.

A -- term "reliability" means something different scientifically.

Q So scientifically, what does "validity" mean?

A "Validity" means, does the thing measure what it's supposed to measure.

Q Okay.

A Does a polygraph allow you to determine whether a person's lying or telling the truth. Does an EKG tell you whether or not a person has a heart problem. Not what it's purported to do, but does it actually tell you. That's validity.

Q Okay. Now, when you're in the scientific world, what does "reliability" mean?

A "Reliability" simply means repeatability. Can you get the same result again on the same sample using the same procedures. Just as, is your bathroom scale reliable; if you step off and step on it, do you get just about the same reading each time. If it varies wildly, you know it's not reliable. And something that's not reliable cannot be very valid, because --

Q Okay.

A -- the results are capricious. So reliability is a prerequisite to validity, but it is not a sufficient thing to establish validity. It still has to be established over and

above that.

Q So when one engages in laboratory studies and field studies, is that consistent with the testing that's done in other scientific disciplines when you're testing methodology?

A That is the standard way of doing science, whether it's astrophysics, biology, medicine, or psychology, psychophysiology. Scientists have to take a little piece of the phenomenon, study it under controlled conditions to understand it better, and then ultimately when they're ready, go out in the field and do the difficult, expensive work.

Q And is this testing method that we've been talking about as to polygraphs, is that consistent with the methodology that's been used in other scientific disciplines?

A Yes, except it's adapted of course to the particular problem.

Q All right. We've been talking a little bit about lab studies. I'd ask you to -- if you have Defendant's Exhibit C in front of you, and ask you if this is an example of a laboratory study?

A Yes, it is.

Q And could you just briefly describe what C relates to us --

A Well, it was an --

Q -- what it tells us?

A Yeah. It's a mock crime study that Dr. Podlesny and I did.

It was actually his doctoral dissertation, in which we had people steal a ring in a mock crime scenario and then we -- we did the procedures as I described them before. We were particularly interested in a couple of things: one, the efficacy of different types of comparisons or control questions; two different types of probable lie questions; we also were looking at another technique called the guilty knowledge technique, which is not at issue here and that's a --

Q Uh-huh (affirmative).

A -- whole different kind of thing. It's trying to discover information. And we were also interested in the effectiveness of different kinds of physiological measures. So we were interested in the -- looking at the technology of recording and determining if there are better ways to record and also what aspects of those recordings are most useful, what features are most useful in making the evaluations of the outcome about truth or deception.

Q Okay. And how was this study conducted -- constructed?

A Well, it was a mock crime study --

Q Okay.

A -- as I mentioned. Just -- just like the ones I talked to you about --

Q Okay.

A -- before and people got their instructions by tape

recording. It was sort of like a Mission Impossible.

Q Got it.

A And it -- it was very compelling. People could earn a monetary bonus, I think, of \$15, but that's in 19 --

Q Uh-huh (affirmative).

A -- 76, so it was --

Q Well, what --

A -- worth more then.

Q What did you learn from this laboratory study?

A Well, we learned first of all that certain kinds of control questions seem to -- or comparison questions seemed to work better than others. We found that if we excluded by age or time the relevant issue, namely the theft of the ring, from the content of the control question -- so if this study were done in 1976, we might say, "Prior to 1975, did you ever take something that didn't belong to you?"

Q Uh-huh (affirmative).

A That would be an exclusive control question. Whereas another version that had been used was, "Have you ever taken something which didn't belong to you?" And there there's a potential overlap --

Q Uh-huh (affirmative).

A -- between stealing the ring and taking something else. We wanted to see if there's a difference, because both were in

use. And we found that what we call the exclusive, excluding by age or by time so that the control question was distinct in that respect from the relevant question, we found that those worked better. In fact, I think the overall accuracy was about 94 percent.

Q When you say that they worked better and when you say that the overall accuracy rate was 94 percent, what are you telling us?

A I'm telling you that the validity for the exclusive type comparison question, probable lie question in this case, the validity was higher; that it did a better job of differentiating deceptive from truthful people than if you didn't exclude it by time or by age, where they could overlap with the relevant issue.

Q And when you say that there was a success rate of 94 percent, what does that describe?

A That means that when we were able to make a decision as to whether or not the person was telling the truth, when the charts were clear enough to make a decision, that only six percent of the time were they wrong.

Q All right.

MR. McCOY: Your Honor, I'd ask that C be admitted.

MR. COLLINS: No objection.

THE COURT: Exhibit C is admitted.

(Defendant's Exhibit C admitted)

BY MR. McCOY:

Q There have been many other lab studies like this; correct?

A Yes, there are dozens.

Q And you're familiar with those studies?

A Yes, generally.

Q Can you describe generally the results of those studies for us?

A Well, those studies generally produce favorable results in terms of validity or accuracy.

Q Uh-huh (affirmative).

A The accuracies vary depending upon the techniques that are used, the sophistication of the researchers in terms of using the state-of-the-art kinds of procedures --

Q Uh-huh (affirmative).

A -- sometimes the subject population; you know, college students are not actually quite as good for many purposes as people from the general community and are less like the general community. But -- so there's a range, and some of the studies are poorly done, some of the studies have, you know, not too great accuracy. But we did a -- a study called a meta-analysis where we examined various studies in the literature. And what we found was the more the study utilized the techniques as they are actually used properly in the field, the more it was

similar.

Q Uh-huh (affirmative).

A And also, the more the subject population was like the real target population, and where there were incentives for both guilty and innocent people to pass the test, the higher the accuracy or the higher the validity.

Q Was there any consistency that you discovered?

A Yeah. That was the consistency, basically. In other words, if you use the techniques as I've described them here, basic -- fundamentally, if you have incentives, and if you use, say, people from the general community or people who've got a known criminal history as subjects, then the accuracy rates were quite high.

Q And --

A Whereas if you didn't, then the accuracy rates were somewhat lower.

Q Is there any consistency between Defendant's Exhibit C and Podlesny's findings that we refer to in B?

A Oh, yeah, they're pretty much the same.

Q All right.

A Yeah.

Q Okay. I want to talk about a field study now. Do you have before you Exhibit D?

A Yes.

Q All right. And we've -- I want you to tell me about that, if you would.

A Exhibit D is the report that I wrote for the U.S. Department of Justice, the National Institute of Justice, on a grant that I had to investigate the accuracy of polygraph tests in criminal investigation. And --

Q And why were you asked to do this?

A Well, because I asked for the money, actually.

Q Okay.

A You know, this has been a pressing problem. I had another large grant in 1976 to '78 from the National Institute of Justice to do similar kind of work, but --

Q And what were you studying? I mean, what --

A We were studying, you know, how are polygraphs used out there and how accurate are they, basically.

Q Okay.

A And particularly with reference to government polygraph exams.

Q And does D represent a field study?

A Yes, it's a field study, and where we used -- I got the cooperation of the United States Secret Service, with whom I had an ongoing consultation relationship, and I knew that they had very high-quality polygraph examiners, well trained people, and they're very careful in their use of the polygraph.

Q How do you know that? Forgive me for asking, but I want to know, yeah.

A No, it's -- that's okay. I had done a lot of training for them. I had developed instrumentation for them. And I had reviewed many of their polygraph examinations and interacted extensively with their examiners. And I also had done an evaluation at the request of the Office of the Secretary of Treasury of all the polygraph programs in the Department of Treasury, which included Secret Service, Customs, and ATF --

Q Uh-huh (affirmative).

A -- Alcohol, Tobacco and Firearms. And in that evaluation I reviewed huge numbers of polygraph cases independently to see the quality of the work, and reviewed the files and everything. And it was clear that the U.S. Secret Service was far and away the highest quality, and in my opinion, the highest-quality program I had seen --

Q Uh-huh (affirmative).

A -- anywhere.

Q Uh-huh (affirmative).

A And so those are the people I wanted to use, because that puts it to the test. If they can't do well, then nobody's doing well.

Q So what were you trying to find out when you -- or what did you find out as a result of -- first of all, what were you

trying to find out when you performed this study?

A Well, we were trying to find out quite a few things. One, the -- the bottom-line question is, how valid is the polygraph --

Q Right.

A -- in criminal investigation. In addition to that, we wanted to find out a lot of detailed things about particular measures. We wanted to see how much consistency there is among different interpreters of polygraph charts. We were developing models for how people interpret polygraph charts, to see if we could improve the process, using computer models. We also wanted to see the extent to which the polygraph results you get in a real-life situation have a similar underlying structure to what you get in a laboratory simulation, because of an often raised criticism by people who basically are not scientists, who say that using laboratory simulations doesn't tell us anything useful about polygraphs in real life. Most scientists believe that they do, and we wanted to see that, and so that was another purpose of this which showed actually this great underlying structural similarity.

So we had all those purposes. But the most important purpose initially was to find out how accurate are these tests in actual criminal investigation.

Q And so how was it constructed?

A Oh --

Q What did you look at?

A -- and I left out one other thing. We also wanted to test some computer models of interpreting polygraph charts.

Q Okay.

A So what we did is, we were able to get the logs year by year of all the polygraph examinations conducted by the U.S. Secret Service. We went through those logs to select ones that appeared to have the charact- -- excuse me -- characteristics that we needed: criminal investigation, a confession by somebody, that would either inculcate somebody or exculpate somebody else who took a test, or both.

Q Uh-huh (affirmative).

A Preferably both, gives us more cases. And we tried to constitute a sample that would be adequate to do these investigations. And we used then confessions, and we also required that every confession have corroborating evidence to make sure that confession's reliable.

Q Uh-huh (affirmative).

A So in a -- in a counterfeiting case, if the person confessed and said, "Yes, I have other bills, counterfeit bills," the -- they had to produce them for the investigators --

Q Okay.

A -- or, you know, if it were a forgery case, a handwriting analysis had to be consistent with the admission, that I --

Q Okay.

A -- I wrote the signature on that check, things like that.

Q Okay.

A So we knew that these were valid confessions. And then --

Q Okay.

A -- we -- we selected a set of cases from those files. We took the -- the polygraph charts, we -- once we selected the cases, the U.S. Secret Service took the polygraph charts out of the file. We coded them using a coding system that I set up for them but they implemented, so we didn't know --

Q So the -- whoever read the charts was blind, then?

A Yeah. We were blind. The Secret Service kept it back at headquarters in Washington so that we could later verify it.

Q Uh-huh (affirmative).

A And they gave us ones that had a code on them, no identifying information. And -- and then, independently, Dr. Honts went through the case files without the polygraphs in them to extract the information that we'd use to verify that there was a confession, and also the other evidence and so on. And that was associated with the case file number, but that's a different number from what was on the polygraph charts. So the Secret Service had later put it together for us.

Q So then what did you do?

A And then we entered all of those charts into computers so we could -- we actually traced them by hand with a tedious process.

Q Uh-huh (affirmative).

A And we also had the polygraph charts numerically evaluated independently, blindly, by six Secret Service examiners who didn't know anything about the case, and Dr. Honts, who was working with me in my lab --

Q Uh-huh (affirmative).

A -- so that we could look at accuracy of the blind interpretations as well as accuracy of the original examiner, because we were interested in how consistent are those. And then we analyzed the results to see what the findings were.

Q And what did you learn?

A We learned that the Secret Service examiners, the original examiners, were extremely accurate. Their accuracy on individual questions -- we did this on individual relevant questions, because their tests often were of the type that tapped more than one aspect of the issue. Because a counterfeit case, say, "Did -- do you have the plates? Did you print any of the money? Do you know where any of the money is now? Did you pass any of the bills?"

Q Uh-huh (affirmative).

A Well, they could be lying or telling the truth independently on each of those things.

Q Uh-huh (affirmative).

A Maybe they just passed bills and they didn't know anything about the rest of it, or maybe they printed them but they didn't pass any bills.

Q Uh-huh (affirmative).

A So we analyzed them on those individual issues, which is a more stringent test --

Q Uh-huh (affirmative).

A -- than looking at the overall result. What we found is that the -- on individual questions, the Secret Service examiners, the original ones, as I recall, exceeded 95 percent in their accuracy.

Q Okay.

A And as I recall, the -- the errors were about equally distributed of both sorts. The errors -- there were about as many errors of a truthful person failing the test, which you'd call a false positive, as there were errors of an innocent -- of a -- of a guilty person passing the test, which we call false negatives. The errors, around the order of about five percent of both sorts.

And the blind interpretations, the errors were somewhat higher on the innocent people, so we had more false positives,

more innocent people failing than guilty people passing. The false negative rate was still very low. It was I think about five percent.

Q So with regard to the false negative, what you're saying is they got it right 95 percent of the time?

A That's right. If a person was in fact guilty, they got it right about 95 percent of the time. If they -- person was in fact innocent, it was closer to 90 percent.

Q Okay. What technique did the Secret Service use?

A They used a variety of techniques which are all comparison question tests. And this is -- these are tests, you know, done prior to 1980 -- let's see, they would have been done prior to 1986, I think. And so they were all what we call probable lie tests, and they used different kinds of formats depending on the case. Some of them were these multiple issue tests, which are often called modified general question test --

Q Uh-huh (affirmative).

A -- very similar to the test I typically use and I used in this case.

Q Okay.

A That was probably the most common. There are others that are called zone comparison test, where there's just one simple issue, "Did you -- did you" --

Q Uh-huh (affirmative).

A -- same thing. There were others that were various combinations of that.

Q All right. This is not the only field study you're familiar with, I'm sure.

MR. McCOY: Could I ask that D be admitted, before I forget?

MR. COLLINS: No objection.

THE COURT: D is admitted.

(Defendant's Exhibit D admitted)

BY MR. McCOY:

Q Are you familiar with a study done by the Office of Technology Assessment?

A Yes, I am.

Q Do you have in front of you Defendant's Exhibit E?

A Yes.

Q Were you involved in that study?

A Yes.

Q What was it?

A This was a study commissioned by the United States Congress at the request of the Committee on -- forget, it was Jack Brooks Committee in the House having to do with public policy issues, I've forgotten the name of it -- the Government Operations Committee, House Government Operations Committee. Because there had been a lot of concerns about the use of

polygraphs by the federal government. At that time, there were two big things happening. President Reagan had issued directives saying that there would be -- polygraphs would be used for national security purposes in trying to identify the source of unauthorized disclosures of sensitive information.

Q Uh-huh (affirmative).

A And also, the Department of Defense was engaging in a very large-scale expansion of the use of polygraphs on government contractors with access to sensitive compartmented information as well as government employees. And so the Congress was concerned, and so it was our responsibility about these uses and the accuracy of polygraphs. So that report was focused on these types of uses. But it was a broad-scale study looking at polygraphs and their history, the types of tests that were in use, and the scientific literature regarding their accuracy. And I served on the national advisory panel of that study for the Office of Technology Assessment which was the research arm of the United States Congress.

Q And who chaired it?

A It was chaired by Professor Edward Katkin, who at the time I think was at the State University of New York, Buffalo, a distinguished psychophysiologicalist, and who became or was president of the Society for Psychophysiological Research at the time.

Q Now, Defendant's Exhibit E, is that a -- sort of an executive summary of the report?

A Well, it's -- it's an excerpt of the major findings as well as showing who served on the panels and who -- and who wrote the study. And it gives the basic findings with regard to the conclusions of scientific validity of polygraphs used in criminal investigation.

Q All right. Tell us what the findings were.

A Basically, what they found, they sur- -- the studies surveyed the reasonable quality laboratory studies that are called analog studies there --

Q Uh-huh (affirmative).

A -- and 10 existing field studies, which varied a lot in their quality. And they -- those were the ones available and so those were the ones that were surveyed. And they --

Q Are we on page 97 of Defendant's Exhibit E? Is that where you're going to?

A Let me open it to that page. That is page -- yeah, 97.

Q Okay.

A Where it says "Specific Scientific Conclusions in Policy Context."

Q Okay.

A And in the upper right-hand column it says, "Ten individual field studies." These were the findings. And the bottom line

is the last thing there. It says the false negative rate, guilty persons found nondeceptive, ranged from 0 to 29 percent and averaged 10 percent.

So essentially, on these studies that had all been conducted prior to 1982, and they varied in quality as was pointed out in -- in the study, the average false negative rate was 10 percent. Namely, one in ten guilty people was found truthful.

Q So in other words, it's a guilty person deceiving the polygraph?

A Right, beating the polygraph, as it's --

Q Beating the polygraph.

A -- said in the vernacular, right.

Q That's one in ten?

A One in ten.

Q Right.

A And the false positive rate, which is just above that, was approximately two in ten. So that more innocent people produced inaccurate results than guilty people. It's easily -- easier to correctly identify the guilty than to correctly identify the innocent.

Q And just so we're -- that we're talking about field studies and lab studies?

A That's field studies.

Q Okay.

A The -- below are the lab studies.

Q Where it says analog studies?

A Analog studies.

Q Got it.

A And the same two figures at the -- the last two lines say that the false positives in the lab studies were 14 percent. So about one in seven innocent people failed the test. And the false negatives were ten percent again, about one in ten guilty people passed the test. So there was a fair amount of consistency. Now, these were all based upon studies done prior to 1982.

Q All right.

A But they show even then a pretty high rate of accuracy or validity for the polygraph when used in specific-incident type situations, criminal investigation type situations.

Q And just briefly, what was your involvement in this? I know you've told us what the results were. What were your involvement in --

A Well, I was a member of the national advisory panel, and I supplied a -- many of us did; it was composed of scientists who are involved with polygraph research and ones who are just well-known scientists who -- or psychophysicologists. It also included people from the polygraph community. It included

people from other disciplines. And we all contributed to the information for the study, because we reviewed what they were doing, we had meetings, we had presentations of research. I made two presentations at those meetings. And I supplied a great deal of raw material from research for the people who had the contract at Boston University --

Q And --

A -- to use.

Q -- there -- you mentioned that there's the advisory panel. I assume that everyone on the advisory panel endorsed this result?

A Well, some of them complained a little bit about it afterward, but we all signed off on it, you know, it -- being a government report, it was a compromise, I think, but --

Q Okay.

A -- the -- what I just covered for you was not disputed by anybody.

Q Uh-huh (affirmative).

A I think it was a question of how one interprets that and --

Q Uh-huh (affirmative). Uh-huh (affirmative). Okay.

A -- but one -- one of the opponents of polygraph didn't want us to even use those results, because he didn't like that information coming out.

Q Okay. Now --

A But he signed off on it.

Q Okay. In terms of the lab studies and field studies that were evaluated by the OTA, do you know what technique or method was used for the polygraphs that were at issue?

A The ones that -- in -- in the field studies, and also in the lab studies, were control question or comparison question tests. That's --

Q All right.

A -- what is meant there by criminal specific-incident testing.

Q Okay.

A None of them were relevant-irrelevant.

Q Okay.

A And it was before the directed lie type comparison question had been developed and implemented.

Q Okay. Well, I think I would like to talk about the directed lie method and the research that surrounds the directed lie method, if we could. And you've described for us what the directed lie method is. Has the directed lie method for administering the comparison question polygraph examination been subject to scholarly research?

A Yes, it has, scholarly and scientific research.

Q And has that scientific and scholarly research been published?

A Yes, it has.

Q And has it been evaluated through the use of lab studies?

A Yes, it has.

Q And has it as well been evaluated through the use of field studies?

A Yes, it has.

Q Okay. I'd invite your attention to Exhibits F-1 through F-6. We'll be talking about those exhibits for a few moments.

First of all, do you recognize them?

A Yes.

Q All right. Tell me about F-1. Tell me what that is, please.

A F-1 is a study entitled The Role of Comparison Questions in Physiological Detection of Deception, by Horowitz, Kircher, Honts, and Raskin. This was Dr. Horowitz's doctoral dissertation, was published in the Journal of Psychophysiology in 1997. And it was a large-scale laboratory study evaluating and comparing the accuracy of polygraph tests using different techniques, including the relevant-irrelevant, the probable lie comparison question test, the two types of directed lies, the -- what we call the personal directed lie, which is the type I've just been describing, "Did you ever, you know, during the first 30 years of your life make -- make a mistake," reaffirming to that person that's something they did.

Q Uh-huh (affirmative).

A And then we had another group called trivial directed lie, just a simple lie, "Is 2 plus 2 four," and the answer is "No," which is --

Q Uh-huh (affirmative).

A -- a lie. And it was done in a mock crime scenario, like I described before. And these different techniques were independently, you know, administered to different subjects and the accuracies were then assessed and -- the -- using the procedures that I've described. And what we thought of was that the personal directed lie had the highest accuracy for guilty people and had the highest accuracy for innocent people.

Q Okay.

A Second best was the probable lie --

Q Okay.

A -- and third best was the trivial directed lie. The relevant-irrelevant was perfect in identifying the deceptive people, because almost everyone failed.

Q Uh-huh (affirmative).

A Only 20 percent of the innocent people were able to pass. So it doesn't differentiate it, doesn't work.

Q And were -- in terms of statistics, when you're talking about the directed lie method, did you learn anything in that regard?

A When you say statistics, you mean --

Q In terms of --

A -- how accurate, or --

Q Yes, sir.

A Well, they were more accurate than the others. As I recall them, they were in the mid- to upper-80-percent range in this laboratory study --

Q Uh-huh (affirmative).

A -- which is a little lower than what we often find in the field. Let's see, it was 84 percent on guilty and 87 percent on innocent.

Q And just please tell me what -- when you say 80 percent on --

A Eighty-four percent?

Q Correct.

A Correct, meaning when the --

Q (Indiscernible) --

A -- decision was made, 84 percent of the time the guilty people were found deceptive.

Q Got it.

A And when a decision was made, 87 percent of time the innocent people were found truthful.

Q And where was this article published?

A Psycho -- Psychophysiology, yeah.

Q Okay.

A Which is the -- the premiere psychophysiology journal in the world.

Q All right. And was it subject to peer review?

A Yes, extensive peer review.

Q All right.

MR. McCOY: Your Honor, I'd ask that F-1 be admitted.

MR. COLLINS: No objection.

MR. McCOY: And I neglected to ask that E be admitted.

Ask that that be admitted as well.

MR. COLLINS: No objection.

THE COURT: Exhibit E and F are all admitted.

(Defendant's Exhibits E and F-1 admitted)

BY MR. McCOY:

Q Let's go to F-2, sir.

A Yes.

Q And ask you to explain for us first whether you recognize it and what it represents?

A Yes, it -- it's a study done by Dr. Honts and myself entitled A Field Study of the Validity of the Directed Lie Control Question. And this was a study done actually before we did the laboratory study, when we became interested in this directed lie, first learned about it from Fuse at a Secret Service research briefing, and thought we -- we should try

using it. But I was reluctant to try it in real life because I felt that these directed lies were pretty weak. And I didn't see how an innocent person would show a big reaction to a directed lie --

Q It sounds to me you have the same skepticism about the directed lie that you had to the polygraph in general?

A Yeah, well, yeah. I -- I thought, God, you know, why would somebody react to that one; if they're accused of a murder, why would they react to a question where you just tell them to lie about a -- making a mistake or violating a rule or regulation if in fact they didn't do the murder. I thought, you know, these are going to be pretty weak. So being conservative, I let somebody else try it first.

Q Uh-huh (affirmative).

A And what happened is, we had a friend who was a polygraph examiner, a colleague who'd studied with us some named Larry Kelly, who was with the Probation, Adult Probation and Parole in the State of Utah, working at the prison.

Q Uh-huh (affirmative).

A And they have a lot of parolees who had to be tested all the time. One of the advantages of the directed lie is you can use it over and over and over again, whereas the probable lie, there's so much maneuvering and manipulation, those things wear out.

Q Uh-huh (affirmative).

A And you can't manipulate a person very many times that way.

Q Uh-huh (affirmative).

A And these parolees, you have to test them periodically to see if they'd violated their parole.

Q Uh-huh (affirmative).

A So he said, "I'd like to try it." And he started trying it, and he came over one day, I remember, and he brought some charts, and he said, "Look at this." And he started showing us charts where he was quite confident the results were correct based upon the independent investigations they'd been doing, and these guys, you know, some of them who were apparently telling the truth, they had huge reactions to these directed lies, much more than I ever expected. So I said, "Okay, that looks interesting." And Honts was really excited about it, so I said, "Okay, Charles, you try it," you know, "in your actual cases."

So what we had to do, we didn't want to compromise the integrity of the polygraphs in real cases. So instead of just switching to all directed lies, we had three comparison questions in our tests, so we took one and replaced it with a directed lie, so that we still had two probable lies --

Q Uh-huh (affirmative).

A -- that we could use to evaluate the test and ignore the

directed lie, so it would be like a regular test --

Q Uh-huh (affirmative).

A -- a probable lie test. But we could then see what happens if you include the directed lie in.

Q Now, when you include the directed lie, would it be in every chart you ran?

A It would be in every chart.

Q Okay.

A And it would be reviewed in advance, similar to the way I described earlier, except it would be reviewed along with two probable lies --

Q Uh-huh (affirmative).

A -- using the method I described before, and then we'd say, "And now, on this test I also need to have one of these other questions."

Q Okay.

A And we'd do the number test so -- of the way I've described also. We always --

Q Uh-huh (affirmative).

A -- do number tests to begin with. And then -- so we put that in, and then what we did is, we started gathering cases like that, then after about a year or so, Honts felt pretty comfortable with it, I said, "Okay, I'll start trying it too." So I started using one directed lie in my actual cases.

Q Uh-huh (affirmative).

A Then we assembled a set of cases where we had independent confirmation, typically by confession --

Q Uh-huh (affirmative).

A -- or some incontrovertible physical evidence, or a recantation in a couple cases by the accuser made in court. And what we did is, I -- Honts gave me his confirmed cases, but he cut off all the names and identifying information and recoded them with just a -- a number.

A And I wasn't given the question list, just the charts with the markings on them, and you can tell which are control and relevant. But I didn't know the questions, so I wouldn't know what case it was.

Q Uh-huh (affirmative).

A Because we might have discussed the case when it was happening. We often consulted on each other's. And then I gave him a similar set from my files. He evaluated mine, blindly.

Q Uh-huh (affirmative).

A I evaluated his, blindly, and we scored them two ways. We scored them using only the probable lies or we scored them using the probable lie and one directed lie on each chart.

Q Uh-huh (affirmative).

A And then we could see if including the one directed lie on

the scoring changed things.

Q And what did you learn?

A What we learned was that it did change things.

Q And how?

A It made the test overall more accurate.

Q Okay. And how were you able to determine that?

A Well, we compared the numerical scores blindly generated by him, Dr. Honts, on my charts, and by myself on Dr. Honts's charts. So we didn't know what the cases were. And then we compared those to what the actual result was based on the confessions and other evidence. And we found that the numerical scores differentiated better when we included the probable lie in the scoring than when we -- I'm sorry, when we included the directed lie in the scoring than when we used only the probable lie. So it improved the discrimination between truthful and deceptive people.

Q So just forgive me for being slow, because I went to night law school; the -- but what you're saying is it's an improvement on the comparison question technique?

A That -- yes, improvement on the probable lie, and --

Q Right.

A -- you know, based upon that we decided, well, this is really worth doing. And -- and then we did the laboratory study, and based upon the one that I just described before, the

Horowitz study, I just started using all directed lies, because they worked better and the test was more straightforward --

Q And --

A -- easier to administer.

Q -- Defendant's Exhibit F-2 is what again? It's just -- basically are -- it's a paper rendition of what you've just told us; is that correct?

A Yes, it's -- it's the actual publication in the Journal of Police Science and Administration.

Q All right. And was this subject to a peer review?

A Yes, it was.

MR. McCOY: Ask that F-2 be admitted.

MR. COLLINS: F-2 appears to be incomplete, Your Honor. The pages 56, 57, and 60 and 61 are the only ones admitted. I don't know if there's a more complete copy available, but it doesn't appear to contain all the information referred to. So with that limitation, if the defense can introduce that, otherwise we have an incomplete --

THE COURT: Mr. McCoy, you may inquire about that.

MR. McCOY: If I could approach the witness, please?

THE COURT: Certainly.

BY MR. McCOY:

Q Do you have (indiscernible).

A Yeah. I can explain what happened here, I think. This was

something that was copied from a double-sided copy. And when the copies were made, apparently the back sides were not copied. I think I have a complete copy in my briefcase which I can make available to you to make copies of those pages.

MR. McCOY: Your Honor, during the noon break we'll get a complete copy in and then I (indiscernible) --

THE COURT: I'll reserve ruling on that too.

MR. McCOY: I beg your pardon, I'm sorry?

THE COURT: I will reserve ruling on it.

MR. McCOY: That's fine, thank you. Thank you, so we'll just reserve on that one.

BY MR. McCOY:

Q Moving to F-3, do you recognize that?

A Yes.

Q And would you tell me what that represents?

A That's a copy of the Department of Defense Polygraph Institute Advisory Committee Research Status Briefing -- Briefing from September of '94, authored by Gordon Barland of that institute, who's a former student of mine.

Q And what does this tell us?

A Well, it tells us -- basically, it's an outline of what the Department of Defense Polygraph Institute was doing in polygraph research. And for our purposes here specifically, it talks about their development of a test for I'm trying to

remember the exact meaning of the acronym, but TES, which is a security test --

Q Testing espionage and sabotage?

A Yeah, testing espionage and sabotage, thank you.

Q All right.

A This was a test that had been developed for those purposes, because the DOD had been experiencing a lot of problems in verifying the accuracy of tests they had been using for national security purposes and there'd been a lot --

Q Just -- if I could just interrupt. Why would the DOD or the CIA be interested in polygraphing for espionage and sabotage purposes? Could you explain that for those of us that aren't in that world?

A Yes. One of the major uses of polygraphs by --

MR. COLLINS: Your Honor, I'm going to object to this line of questioning. The document that -- F-3 as presented to the government by the defense appears to be a photocopy of a fax, which -- the last page says, "This appeared in a plain brown envelope, source unknown." This does not appear to be the same type of document previously introduced. Unless Dr. Raskin can testify to firsthand knowledge, object to that -- it's hearsay, and there's no foundation of this.

BY MR. McCOY:

Q Why don't we talk about that. Do you have firsthand

knowledge of this document?

A Yes.

Q Why don't you tell us how you -- how it is that you have firsthand knowledge of this document?

MR. COLLINS: And my objection is not whether he has firsthand knowledge of the documents, the -- firsthand knowledge of the information contained in the document.

MR. McCOY: Judge, 703 allows him to testify to things that are in documents that he's relying on. And then if he thinks that he's never seen the document, that's fair, if he can't --

THE COURT: Long as the record is clear as to the basis for his knowledge and testimony.

MR. McCOY: Right, okay. All right, thank you.

BY MR. McCOY:

Q Sir, do you have personal knowledge of this document?

A Yes.

Q And would you tell us how it was you got personal knowledge of the document?

A Dr. Honts faxed this to me from the University of North Dakota.

Q Is he a colleague of yours?

A Yes, he is, and he has --

Q How --

A -- formerly worked at the Department of Defense Polygraph Institute as a -- a senior research scientist before he went to the University of North Dakota.

Q And have you talked to Dr. Honts about the contents of this document?

A Yes.

Q Do you recognize the contents of this document?

A Yes. And also the -- the part that we're talking about has also been presented at scientific meetings.

Q Has it been presented in court before?

A Yes.

Q Have you testified about it in court before?

A Yes.

Q All right. What does this document tell us?

A It tells us about the research program that was going on at the time at the Department of Defense Polygraph Institute.

MR. COLLINS: Has the Court ruled on the foundation of the use of this document?

THE COURT: He hasn't offered it yet.

MR. COLLINS: The basis of his testimony as to the information contained in it, is the Court ruling that it's admissible?

THE COURT: So far, I haven't found his testimony objectionable.

BY MR. McCOY:

Q All right. Before we were interrupted -- I'm trying to remember what we were talking about.

A You were asking me what this particular document indicates, I think.

Q All right. And why don't you tell us what it indicates?

A Well, it's a description of the very studies that were ongoing and completed at the Department of Defense Polygraph Institute as of this date, and it was presented to their advisory committee, which -- composed of scientists. And it was presented by Dr. Barland, who's also discussed this with us since then. And it describes a variety of studies, one of which was the -- these attempts to develop a test for espionage and sabotage that could be used in national security situations that had a higher accuracy than the tests that they had been using that had been called into question a lot.

Q And I guess where we were interrupted, I said, what is the importance of developing that sort of test, for those of us --

A Yes.

Q -- that are not in the security world?

A Right. The importance was that the Department of Defense and the CIA, I think you included them --

Q Uh-huh (affirmative).

A -- are extensively involved in the use of polygraphs for

national security purposes. It is the major use of polygraphs by the federal government.

Q Uh-huh (affirmative).

A I think there are some tens of thousands of tests run a year. And --

Q And what are they testing for?

A They're testing for various things and activities on the part of individuals that may compromise the integrity of sensitive information that's related to the national security of the United States. In particular, they are used -- that kind of testing is used, first when people are hired, and that's sort of a general screening test. Every employee of the CIA has to take such tests. Every person who has high-level access to sensitive information has to take such tests. Secondly they are used whenever a person goes on a security mission where they might be out of the country and come back, and may have had contact with foreign nationals or agents of other countries, and where they are then debriefed and tested with a polygraph about whether or not they've done unauthorized things with regard to these things. Thirdly, they're used when there's a specific suspicion --

Q Uh-huh (affirmative).

A -- that an individual is engaged in espionage or sabotage.

Q Does the Department of Defense, to your knowledge, place a

high degree of reliance on polygraph -- the polygraphing of individuals in these circumstances?

A Oh, yes. Not only Department of Defense but all the federal agencies -- FBI, Secret Service -- have worked on cases, some of the recent high-visibility ones where polygraphs have been utilized to detect people engaged in espionage.

Q All right. There's something that's referred to as TES that you had difficulty --

A Yes.

Q What is that?

A Well, that's this test for espionage and sabotage, where they're attempting to determine whether or not a person has been involved in any such activities. And that particular format that they call the TES was developed using the directed lie. And they did research. This research was conducted by Sheila Reed, a Ph.D. psychologist who was at that time at the institute -- actually a student -- former student of Dr. Katkin's.

Q Uh-huh (affirmative).

A And she was in charge of doing this research. And they develop -- they developed this test that used only directed lies as comparison questions as compared to the probable lie questions they have been using earlier, and found that it was far more accurate, in fact, reported that it was the most

accurate test that they had ever developed.

Q Who reported that?

A The Department of Defense Polygraph Institute. Sheila Reed presented a paper at the psychophysiology meetings around 1994, I think. I could look it up.

Q That's fine.

A And of that -- that presentation, we talked about it. And then it was published later in the Journal of Polygraph, the study that's described briefly in this research briefing was presented at the -- and published in -- in the Journal --

Q And --

A -- of Polygraph.

Q And this woman's name again?

A Sheila Reed.

Q And Ms. Reed was aware of what's -- what was identified as Defendant's Exhibit F-3?

A Oh, yes. In fact, I discussed it with Dr. Reed. I know her very well and I used to see her regularly at the meetings.

Q And the verb here is that this TES test is essentially a directed lie question test?

A Yes, it is. It uses only directed lies for comparison questions, to be compared to the, you know, relevant questions about espionage and sabotage.

Q And the conclusion by the DOD as to the accuracy, what is

that?

A Let's see, let me find the page. It's -- let's see. It's on page 8 of the report, page 10 of the fax, under number 7. It says the three test formats were compared in an analog screening situation: CSP, which is a Counterintelligence Scope Polygraph, I think that's what that stands for, with probable lie questions, then that same type of test with directed lies, and the TES, which is only directed lies in a slightly different question format.

Q Uh-huh (affirmative).

A And it talks about how many examine -- how many subjects were examined. It says, "The three tests were equally accurate at clearing innocent subjects." So the false positive rate was pretty similar. However, the TES was significantly more accurate at detecting deceptive subjects.

Q What does that mean?

A What that means is, it had fewer false negatives, that it was tougher for a guilty person to pass this TES with all directed lies than it was to pass the other two types of test, one of which was all probable lies and the other one had directed lies in it but was an earlier format.

MR. McCOY: Your Honor, I'd ask that Defendant's F-3 be admitted.

MR. COLLINS: Same objection.

THE COURT: State the objection again.

MR. COLLINS: It was that the document here, the photocopy of unknown origin, he's testified essentially to his recollection, and there's no foundation that this document is in fact what it purports to be.

MR. McCOY: We rely on 703, Your Honor.

THE COURT: Objection's overruled.

(Defendant's Exhibit F-3 admitted)

THE CLERK: Is it for 2 and 3, Your Honor, or just 3?

THE COURT: F-3.

MR. McCOY: I -- if I have not -- Mr. Clerk, I thought I moved F-2 in. If I'm mistaken, please tell me.

THE COURT: That's the one you -- I reserved ruling on.

MR. McCOY: Oh, thank you, Your Honor. Thank you very much, yeah. Thank you.

MR. COLLINS: Your Honor, the noon hour has struck. Will we be continuing on into the noon hour?

THE COURT: Let's talk about when you want to take the lunch break, and --

MR. McCOY: This is probably a good -- we're in the middle of this. This is probably a good point, since I've been going since 9:30.

THE COURT: All right. I looked at the volume here. Are you going to go through all these exhibits?

MR. McCOY: Yeah. I would -- it will go much quicker when we get the -- when we get to the peer review articles, it will be to establish the nature of the peer review. It's not going to be quite the extensive discussion that we're having now.

THE COURT: And what's the government's assessment of its witness problem, if any? Do you -- with the evidence you're going to present on, do you have somebody that has to get through today?

MR. COLLINS: I don't believe so. I have -- I believe he's available until tomorrow.

THE COURT: How long would you like for lunch?

MR. McCOY: I wouldn't mind an hour and a half.

THE COURT: And how long --

MR. McCOY: I mean, I'll defer to the Court. That's -- you asked me what I wanted.

THE COURT: How long do you want to go today? I don't need that much time.

MR. McCOY: Yeah.

THE COURT: How long do you want to go this evening?

MR. McCOY: Until 5.

MR. COLLINS: I think that'd be fine.

THE COURT: Do you think that'll conclude it today, or do you think you'll need more?

MR. McCOY: I think I would -- I would expect that I would conclude today.

THE COURT: Leaving how much time for the government? I know you can't anticipate cross-examination, but just a reasonable guess.

MR. McCOY: Okay. I would think by 3, if we start at 1:30. I mean, if the Court would prefer 1 o'clock, that's fine, but --

THE COURT: I have some time tomorrow if need be.

MR. McCOY: I mean, we did ask for two days, I remember that.

THE COURT: I have blocked it out so far.

MR. McCOY: Yeah.

THE COURT: All right. I'll allow an hour and a half. If you're ready to go sooner, then alert Mr. Collins and --

MR. McCOY: That'd be fine.

THE COURT: -- we'll be ready to go. I can go in an hour for sure.

MR. McCOY: That's fine. I appreciate the Court's courtesy.

THE COURT: And we'll go at least until 5. We'll be in recess.

THE CLERK: Please rise. This court now stands in recess until 1:30.

(Recess at 12:00 p.m., until 1:30 p.m.)

THE CLERK: Please rise. His Honor the Court, this United States District Court is again in session. Please be seated.

THE COURT: We'll continue with the hearing. The witness is still under oath. Mr. McCoy.

MR. McCOY: Thank you, Your Honor.

BY MR. McCOY:

Q Dr. Raskin, before our break, we were talking about the F exhibits.

A Yes.

Q Generically, what do they address?

A They address the directed lie type comparison question test and its validity, as well as the extent of its use.

Q We talked about F-1, which was a Horowitz study, and that's been admitted to evidence. You recognize that?

A Yes.

Q Would you tell Judge Roberts who funded that study?

A That was funded jointly by the U.S. Department of Justice, National Institute of Justice, the United States Secret Service, and the United States Department of Defense.

Q And why was it funded, do you know?

A Well, they were interested in the question of how accurate is the directed lie and is it, you know, a substitute for the

probable lie question.

Q During the break did we discover the -- or obtain a copy of the missing page that was in F-2?

A Yes.

MR. McCOY: Your Honor, can I approach the bench, please?

THE COURT: Yes.

MR. McCOY: The record should reflect that I've supplied Mr. Collins with a copy of this page. This would go with Exhibit 2 -- F-2. And I'd ask that F-2 be admitted.

MR. COLLINS: No objection.

THE COURT: Exhibit F-2 admitted for the purpose of this hearing. And this will just be added to the -- to F-2 itself.

(Defendant's Exhibit F-2 admitted)

MR. McCOY: Thank you.

BY MR. McCOY:

Q Dr. Raskin, focusing your attention on F-4. Do you recognize that?

A Yes.

Q Tell me what it is.

A It's an article published in the Journal of Polygraph in 1998, entitled Psychophysiological Detection -- Detection of Deception Accuracy Rates Obtained Using the Test for Espionage and Sabotage, which is a description of the study validating

the use of the directed lie control for that type of a test conducted by the Department of Defense, the one we've talked -- talked about earlier that's described in F-3.

Q And there was some question about the authenticity of F-3? I mean in the courtroom here.

A Yes, Mr. Collins --

Q Right. What does F-4 tell us, the polygraph article from 1998?

A Well, it tell us in great detail about that research that was described in F-3, and it tells us that that particular test that they developed using just directed lies was a highly accurate test and more accurate than the other types of tests they had been using up to that point.

Q Okay.

MR. McCOY: Move to admit F-4.

MR. COLLINS: No objection.

THE COURT: Admitted.

(Plaintiff's Exhibit F-4 admitted)

BY MR. McCOY:

Q Dr. Raskin, was F-4 peer reviewed?

A As far as I know. It was reviewed by the Journal of Polygraph under the editorship of Donald Krapohl, who's the current editor, and I know he's pretty scrupulous about doing that.

Q Drawing your attention to F-5, could you tell me if you recognize that?

A Yes, I do.

Q Would you tell Judge Roberts what F-5 represents?

A F-5 is a letter from Dr. William Yankee, who was at the time this letter -- letter was written in November of '94 the director of the Department of Defense Polygraph Institute.

Q Do you know Dr. Yankee?

A Yes, I do.

Q All right. And what was the cause -- what was the inquiry that led to this letter?

A Dr. Honts wanted to find out the extent to which federal government agencies were using directed lie tests. And so he wrote a letter to Dr. Yankee under the Freedom of Information Act requesting that information, and Dr. Yankee provided him with this response and Dr. Honts provided me with a copy of the letter.

Q All right. And what federal agencies does Dr. Yankee identify as using the directed lie comparison test?

A The Air Force Office of Special Investigations, the --

Q Who are they? What are they?

A Well, that's the -- the investigative agency of the Air Force that handles all the criminal --

Q Police agency?

A -- investigations and they -- I think they do some national security --

Q All right.

A -- investigations too.

Q All right. Who else is identified within the federal government as using the direct lie comparison test?

A The Office of the Secretary of the Air Force. The U.S. Army Intelligence and Security Command. The Defense Investigative Service. The Defense Intelligence Agency. The Naval Criminal Investigative Service. The Central Intelligence Agency. The Internal Revenue Service. The Department of Energy. And the Drug Enforcement Administration.

Q And to your information, do you have any information that suggests that the directed lie comparison test is no longer used by the federal government?

A No. That's not the information that I have.

Q What is your information?

A That they do use it, and probably more widely than they did in 1994.

MR. McCOY: Your Honor, I'd ask that F-5 be admitted.

MR. COLLINS: Yes. No admission -- objection.

THE COURT: Admitted.

(Defendant's Exhibit F-5 admitted)

BY MR. McCOY:

Q Invite your attention, Doctor, to F-6. Could you tell Judge Roberts what that is?

A These are excerpts from the transcript of the proceedings in *U.S. v. Galbreth* on March 10th, 1995, particularly excerpts from the testimony of Dr. Gordon Barland.

Q All right. And what was the result -- did the district judge admit or not admit the polygraph result in that particular case?

A She admitted the polygraph which I conducted.

Q All right. And why is it that we've included Dr. Barland's testimony in the F exhibit?

A Well, there are a couple of things. One is it establishes his credentials as a scientist and an expert. And he was then the director of extramural research for the defense -- Department of Defense Polygraph Institute. Secondly, it demonstrates that Dr. Barland, as a government employee, also believes that the polygraph technique is scientifically valid. But most particularly with regard to the directed lie, on page --

Q 364?

A Let's see. I think -- is it 364? Yes, on page 364 he's asked about the -- well, he starts at the bottom of the page 363. He was asked a question, "And the primary technique that is accepted in the profession for specific issue testing such

as involved here is the control question technique; isn't that correct?" "Yes." "Both the directed lie and the probable lie are versions of the control question, are they not?" Answer: "That's correct." Question: "And you have no research to indicate that the directed lie technique is not an effective control question, do you?" Answer: "The research that I am aware of both by others and by the institute," meaning the Department of Defense Polygraph Institute, "have shown that the directed lie control question test is at least as accurate as the conventional probable lie control question test."

Q All right. And refresh my recollection; what was the position he had when he made -- offered this testimony?

A His position I believe -- I should check -- he -- he was employed as the chief of external research at the Department of Defense Polygraph Institute. And he also talks about teaching in their course there, which he still does, I believe.

MR. McCOY: And I'd ask that Defense Exhibit F-6 be admitted.

MR. COLLINS: No objection.

THE COURT: F-6 admitted.

(Defendant's Exhibit F-6 admitted)

MR. McCOY: All right.

BY MR. McCOY:

Q Have you ever been invited or asked to consult with the

U.S. Government regarding -- for the purpose of replacing the probable lie control or comparison test with the directed lie comparison test?

A Yes.

Q Would you please explain how you were consulted and what the result was?

A I was asked by a member of the President's Joint Commission on Security that was evaluating polygraph testing within the federal community to meet with them in a special session conducted at Langley, Virginia at the CIA headquarters to give them information and answer their questions about polygraphs and about the directed lie in particular. That was -- I don't remember the exact date. It was around 1992-'93. And I met with them for two or three hours. And they were very concerned about the continued use of the probable lie question because of problems of invasion of privacy and also accuracy. And I explained to them the advantages of the directed lie approach that overcomes those problems, and they were quite interested. I believe that they took that advice, and that is part of the impetus for its growing use in the federal government.

Q All right. I want to talk about how you score a polygraph examination. Could you -- do you have before you Defendant's Exhibit G?

A Yes.

Q Would you tell Judge Roberts what Exhibit G purports to represent?

A Exhibit G is a copy of a manuscript which is accepted for publication in the Journal of Polygraph; in fact, it was invited by the editor of Polygraph, Donald Krapohl. And it is a description of what is known as the Utah Numerical Scoring System that was developed at the University of Utah in my laboratory. And it describes how the system came about and the research underlying it and the procedures that are utilized and its scientific reliability and validity.

Q Okay. Could you explain to Judge Roberts how this system was developed?

A Well, basically, we began with what was already being done by the federal government, which at the time was the United States Army Military Police School at Fort Gordon, Georgia --

Q Uh-huh (affirmative).

A -- that trained all the federal examiners except the CIA. And that was the numerical scoring system that was most widely used. And we have over the years since we started this research in 1970 attempted to validate scoring systems by looking at particular features of the physiological recordings that may or may not be useful, and the ones that were being used at the time as well as ones we thought might be useful, and we have conducted many studies in which we use that scoring

system. And we also use computer techniques to identify the -- the things that can be best used to discriminate between truthful and deceptive people and have adjusted the criteria and rules for scoring based upon that body of scientific research which extends over a period of probably 25 years. And that -- that is how the system was developed.

So everything that is in that system today is based upon accepted concepts of human psychophysiology combined with empirical scientific studies that determine the extent to which those features and rules are useful --

Q Uh-huh (affirmative).

A -- in producing accurate interpretations.

Q And Defendant's Exhibit G explains how this is arrived at; is that correct?

A Yes.

MR. McCOY: I'd ask that G be admitted.

MR. COLLINS: No objection.

THE COURT: Clerk may admit it.

(Defendant's Exhibit G admitted)

BY MR. McCOY:

Q Dr. Raskin, how do you derive a numerical score from a chart?

A The basic procedure is to take the polygraph chart and compare each presentation of each relevant question to a nearby

question that's either a probable lie or a directed lie, depending upon -- upon the type of test that's used. And you do this for each physiological component, starting with the respiration, and then the skin conductants, the blood pressure, the finger pulse. And for each of those you assess the magnitude of reaction based upon the set of criteria that have found to be -- had been found scientifically to be useful for each of those reactions. You assess the magnitude of reaction to the relevant question when compared to the magnitude of reaction to the strongest of any nearby comparison questions.

Q All right.

A And the relative size of those two reactions is assessed, and according to a set of rules, you determine whether there's any difference, and if there is a difference, how big a difference there is, and in which direction, whether it's stronger to the relevant or stronger to the control or comparison question. And if there is no noticeable difference, you know, given how variable the tracing may be, you assign a zero.

Q Uh-huh (affirmative).

A If there is a difference, you assign either a 1, a 2, or a 3, depending on how strong that difference is. And if the difference is such that the reaction to the relevant question is greater, you assign a negative number, a negative 1, 2, or

3. And if the reaction to the comparison question is greater, you assign a positive number, positive 1, 2, or 3. And you do that for respiration, then you do it for skin conductants, and then blood pressure, and then finger pulse, if you have finger pulse. And then you do that for each relevant question in the chart, and then you do that again for the next chart and the next chart, until you're finished. And then you add them all up to come to a result.

Q And what you're describing is an application of the Utah score system?

A That is the Utah scoring system.

Q All right.

A It's -- it's fundamentally similar to the earlier government system except that it's refined, it has reduced the number of criteria that are used, because many of the ones they used are not useful or they're wrong --

Q Uh-huh (affirmative).

A -- as demonstrated by --

Q Well --

A -- the --

Q -- have there been scientific studies performed to evaluate the reliability of the Utah scoring system?

A Oh, yes, yeah.

Q And how about scientific studies performed to evaluate the

validity of the Utah --

A Yes.

Q -- scoring system?

A Quite a few.

Q All right.

A And they're in this paper. They're listed in tables here.

Q All right. Maybe we could talk about the tables that are in Exhibit G. Could you turn to page 4? Or actually, why don't you invite our attention to where you think we should be referring to --

A Well --

Q -- so we can discuss the tables and explain their significance.

A Yeah, well, page 4 is the first table. And that table is a list of five reliability studies where we compared two things. We -- we looked at the decisions made by the original examiner --

Q Uh-huh (affirmative).

A -- in these laboratory studies, and the decisions made by a blind interpreter, to assess how consistent they are.

Q Okay. And what did you learn?

A And the first column here shows that those varied from 95 to 100 percent agreement on decisions. So what it shows is, there's a very high inter-rater reliability on decisions --

Q Using the Utah scoring system?

A -- using the Utah scoring system when neither examiner knew whether the person was in fact truthful or in fact deceptive.

Q All right.

A Then the second column in that table shows the -- the statistical correlation, where we calculate a correlation coefficient between those actual numerical scores of the original and the independent evaluators. And these show very, very high correlations, as high as you ever see with any kind of a psychological test, higher than most.

Q Uh-huh (affirmative).

A The lowest was .92 in these studies, and the maximum achievable is 1.0.

Q Uh-huh (affirmative).

A So this -- these are extremely high inter-rater reliabilities.

Q Okay. What other things does this -- were there other charts that you wanted to discuss in connection --

A There's another table, Table 2, which I think is probably toward the back, let's see. It's on page 15, although it's not --

Q Page 16 --

A It's 16, but it's not numbered.

Q Yeah.

A The figure -- caption -- no, it's just not numbered, for some reason. Sorry. But it says Table 2. And -- let me get this chart here. This shows the validity of that system in cases where ground truth was absolutely known in laboratory studies. And again, it shows a very high degree of validity. The average validity I think is described in the table, averaging over all of those, and it show -- let's see, I have to find it, where that's discussed in the table -- I mean, in -- in the text. Let me find it (indiscernible). Well -- oh, here it is. It's on page 4, describes that table.

The overall percentage of correct decisions was 91 percent for guilty and 89 percent for innocent subjects.

Q In other words, it correctly identified guilty test-takers --

A Ninety-one percent --

Q -- percent of the time --

A Right, in these laboratory studies.

Q All right. And we have in front of you a chart. And I'm wondering if that would help you illustrate the testimony about how to score a chart.

A Yeah. It would.

Q All right. For the record, it's been identified as Defendant's Exhibit CC. Could you tell me what that is?

A Yes. That's a -- that's a number test from the --

Q And who is that number test --

A -- examination that I conducted on Constance Walker on December 5th of 1998.

Q And using this chart, would it help you illustrate how -- the various charts that are on the chart as well as how you scored?

A Yes.

Q Okay. Could you review it for us, please?

A Yes.

Q Do you have a pointer, if you think that would help, or if it'd help you to go up, whatever your pleasure.

A Well, might be easier if I just stand over here a little bit, and then I could use the pointer, stay out of people's way. Is that picking me up okay?

THE CLERK: Yes, thank you.

BY MR. McCOY:

A Let me explain what's on this chart. This is a typical chart from the computerized polygraph system. And what it shows is the different physiological tracings. Well, first, it has a header on it over here that says who the subject is and which chart it is and the date and the time of the beginning and end and who did the exam and what the pressure was in the blood pressure cuff. And then along the left axis here it shows the -- the labels for each of the tracings. So TR stands

for thoracic respiration, the upper breathing channel around the ribcage. This one is the abdominal respiration, so that's done around the abdomen. This, SC, means skin conductants, and it shows the sweat gland activity. And the next one, BP, is -- stands for relative blood pressure, from the blood pressure cuff on the arm. And PL stands for plethysmograph, which is the pulse off the finger.

And these are continuously recorded from left to right. So the beginning of the chart here is left and it goes all the way to the right. Each of the little dots that you can see in this grid is a second elapsed time. And every time you see a vertical line through the chart, it shows the beginning of a question being asked. And if you look at the bottom of the chart, it shows where the question was asked and where it was answered and which question it was and what the answer was.

Q Show me where the question was asked, can you --

A So the first question, number 1, and that would have been in this number test, "Did you choose the number 1?"

Q Uh-huh (affirmative).

A It would have begun where this little block goes upward, and the duration of that question is the entire block, and it comes down at the end of the question.

Q Uh-huh (affirmative).

A And then the next little vertical line is the point at

which the subject gave the answer --

Q So --

A -- in this case, "No."

Q Okay. So the first question, the block represents the question, the line represents the answer?

A Yeah, the little vertical line --

Q Correct.

A -- was just the brief answer, and the minus sign indicates that it was a "no" answer.

Q Okay.

A And then you see an elapsed time here of about 15 seconds. In this case it's like 17 seconds -- 16, actually. And then the next question was asked, "Did you choose the number 2," and so on.

Q Okay.

A And then we can correlate the questions being asked with the activity we see in the physiological tracings. And to use an -- as an example for scoring, number 5 here is the number that Constance Walker chose.

Q Why don't you explain to Judge Roberts what you were doing here.

A This was the number test, where I told her to choose a number between 3 and 6.

Q And what did you ask her to do?

A And I said, "Do you have a number?" And she said, "Yes."
I said, "Tell me what it is." She said, "Five." I said,
"Okay, on the test, I want you to lie about the number that you
chose."

Q Is that a directed lie?

A That's a directed lie.

Q All right.

A "And I want you to answer 'no' when I ask you did you
choose the number 5. I'm going to ask you did you choose 1, 2,
3, 4, 5, 6, 7. Want you to answer 'no' every time. So you'll
be lying when you answer 'no' to number 5 and you'll be telling
the truth on the other numbers."

Q Okay.

A "And that way I can see the difference and reaction when
you lie and when you tell the truth." And then we proceeded
through this test, as you can see here. And you see following
number 5 there's a little "OT" printed there. And that's
because I hit a function key that is designated as other, and
in this test it means that's the one she chose.

Q Okay.

A So that's a little mark that I entered.

Q Uh-huh (affirmative). Uh-huh (affirmative).

A And then I can compare. Suppose we consider in this test
number 5 to be the relevant question. And we're going to find

out if she came out deceptive or truthful on that question.

Q Uh-huh (affirmative).

A Of course, we don't normally do that --

Q Okay.

A -- with the number test, but this is just for illustration.

I would compare the reactions on number 5 to the reactions on the two surrounding comparison questions, number --

Q 4 and 6.

A -- 4 and 6.

Q Uh-huh (affirmative).

THE CLERK: Mr. McCoy, you're both on the same channel, so you need to speak one a time, please.

MR. McCOY: Thank you.

THE CLERK: Thank you.

BY MR. McCOY:

A So assuming that's what we're going to do, what I would do is I would start by looking at the breathing tracings. And we assign one number for the composite of the two breathing tracings. And there are a number of things we look for in breathing. In general, a reaction in breathing is indicated by a decrease in respiratory activity, a suppression of breathing. That can be displayed by a -- a slowing or, you know, very shallow breathing, as -- as you see in this little place over here or here, or it can be shown by the baseline at the bottom

of the breathing tracing rising up, which we see maybe a little bit through here, although there isn't really much of that in this. In fact, in this particular instance, the breathing tracing's not terribly useful, because it doesn't show many clear differences.

But if we compare the breathing tracing and assign numbers, we notice that it's sort of suppressed, beginning about midway after asking 3, all the way up till 5. And then we see a little bit of distortion at 5.

Q And what does that indicate, if anything?

A Well, in this particular test, since she knows the order --

Q Uh-huh (affirmative).

A -- and there are numbers coming in sequence, she's anticipating that she's going to lie in number 5.

Q Uh-huh (affirmative).

A And so actually -- so she suppressed her breathing all the way through 4.

Q Uh-huh (affirmative).

A She was probably thinking, "Well, 5 is coming next, and I'm going to lie on 5."

Q Uh-huh (affirmative).

A And so you -- actually, with this type of a test, you sometimes see it before the lie itself actually occurs. And -- but that's not how one normally scores this particular kind of

test. But we see, there's not a differentiation in the breathing. But when we come to the skin conductants, what we see is the very first question commonly produces the biggest reaction. And we never score the first question, because -- because it's first and then it's the first question and breaks the silence, that produces what we call an orienting reflex and it's never scored. So you never put an important question in the first couple positions in a test.

Q Uh-huh (affirmative).

A In fact, in our test, the first important question occurs at number 4.

Q Okay.

A That would be the first directed lie question.

Q Okay.

A And so not counting that one, when we look through the rest of the skin conductants, particularly number 4 and number 6, and compare it to number 5, number 5 is clearly much larger than number 4 or number 6. So we know we're going to assign a minus number --

Q Uh-huh (affirmative).

A -- because the relevant question has the bigger reaction. And when we measure these and apply the rules, this would probably be -- it's a close call between a minus 1 and minus 2.

Q Uh-huh (affirmative).

A I'd have to measure it, but I think it may qualify for -- it might qualify for a minus 2.

Q Uh-huh (affirmative).

A Which would be strongly in the direction of deception. But you wouldn't make a decision just on one presentation.

Q Right.

A Then we would go down to the breathing -- I'm sorry, to the cardiovascular.

Q Uh-huh (affirmative).

A And what we would see here, is on number 4 we see a little bit of a rise here. We see a pretty similar rise on number 5, not much on number 6. So we'd be comparing 5 to 4. And there's really not a noticeable difference there. So --

Q Uh-huh (affirmative).

A -- we would score that as a zero. We come down to the finger pulse, we don't see really much in the way of any criteria for scoring. There's a little bit of a wiggle of the finger here, but that's too light to be even considered. We don't consider reactions that start later than five seconds after the answer. That one's about four -- about six or seven seconds after the answer, it doesn't affect anything. So we don't see much change there at 4, we don't see a change at 5, we don't really see a change at 6, other than, again, a little wiggle of the finger there. These are probably just little

involuntary --

Q Uh-huh (affirmative).

A -- twitches. People ordinarily sometimes move their fingers a little bit. And so we don't see any difference there. So when we add all this up, we have zero for the breathing, minus 2 for the skin conductants, zero for the cardio, zero for the finger pulse. So this question on this presentation would get a minus 2.

Q Which would indicate deception?

A Well, it would be -- it's going in that direction.

Q Uh-huh (affirmative).

A If it were -- that's not enough information --

Q That's fine.

A -- to draw from. If we had like three charts and three or four questions, then we'd add them up --

Q Got it.

A -- and if it were consistently like that, then we would say deception.

Q Okay. And then basically what you're doing is you're comparing questions that appear relatively together in the sequence of questioning?

A Yeah, close in time together, so that they can reasonably be compared.

Q Okay. And typically, how many charts do you score in a

test?

A Typically, three, sometimes five --

Q Okay.

A -- depending upon how clear it is after three.

Q And you score each chart individually?

A Yes.

Q And what happens after you score each chart individually?

A Then what you do is you add up the scores. So if you had three charts and four relevant questions --

Q Uh-huh (affirmative).

A -- you would have each relevant question presented three times.

Q Uh-huh (affirmative).

A And then you would have four scores for each of those presentations, one for each of the different physiological components.

Q Uh-huh (affirmative).

A So you'd have a little table of four relevant questions, four physiological responses, which would give you 16 points at which you made a comparison. And you'd add those vertically for each of the relevant questions for that chart, then you'd add them for the next chart and add them for the next chart to get a composite total, and then you would add them together for all the relevant --

Q Right.

A -- questions.

Q And these are the questions that you've reviewed with the examinee during the pretest interview?

A Correct.

Q That you've given several times through the exam?

A Yes.

Q Varying the order?

A Yes.

Q All right. Is there a subjective element to the scoring processes?

A To some extent. As you see when I've been describing this, you have to apply the rules to make some decisions. However, although there is a subjective element, the rules are relatively simple, and a person who's trained and experienced can apply those rules very consistently. And that's what those reliability figures that we talked about before show.

Q Is there research that discusses the reliability of scoring between scores?

A Yes. And that's the Table 1 that we talked about in this article on the Utah scoring system, shows that even though there is some subjectivity, people very quickly learn to apply the rules consistently, and blind interpreters who are unbiased --

Q Uh-huh (affirmative).

A -- will come to the same conclusion, not knowing what conclusion is the correct conclusion.

Q Got it. Is there any difference between scoring these charts, say, and the scoring of charts in any other discipline?

A Well, I mean, you know, like recordings of a medical nature, like these --

Q For example, X-rays or electrocardiograms. Tell me -- talk about that and compare it to those processes.

A It's the same kind of process. You have, say, an electrocardiogram, you make recordings of cardiac activity from a set of electrodes that provide different views of the electrical activity of the heart.

Q Uh-huh (affirmative).

A And each one of those tracings will provide slightly different information which allows a cardiologist to look at that recording and say, "Well, I see a -- a valve dysfunction here." Or "I see a premature ventricular contraction over here."

Q Uh-huh (affirmative).

A And these types of abnormalities have particular characteristics that appear in those recordings. But the EKG itself doesn't tell you that automatically. The human interpreter has to look at it and say is that present or not.

And trained cardiologists are very consistent at identifying those things. They're published in books, they're rules.

Same is true of a radiologist who looks at an x-ray. You can have two experienced radiologists look at the same x-ray, not knowing exactly what they're looking for, you know, other than what area, and if they're experienced and well trained, they'll come to the same conclusions. But they have to interpret those photographs. They're photographs and they're -- say, is this a fracture or not; what type of a fracture is it, and so on. Or is this a -- is this shadow here a malignant tumor, or is it simply something insignificant.

Q Okay. And what we're talking about here is the comparison question technique; correct?

A Yes.

Q And you're aware of laboratory studies that have tested it in actual application?

A Oh, yes. And field studies too.

Q Okay. Over the last couple of decades?

A Yes, there are quite a few studies.

Q And you have no doubt in your mind that this can be tested through the scientific method?

A Not only no doubt, but it has been repeatedly tested that way --

Q All right.

A -- and published.

Q What I want to do is talk briefly about what your conclusions are about the error rates --

A Yes.

Q -- okay. Please tell us what they are for guilty subjects, and explain what guilty subjects are.

A The error rate, you mean, using this numerical scoring system?

Q Yes, uh-huh (affirmative).

A Well it depends on whether you're talking about laboratory studies or field studies. And of course, when you say error rates for a scoring system -- how -- how should I say this. Reliability --

Q Uh-huh (affirmative).

A -- figures are the more appropriate way of saying that the scoring system works properly in terms of how good's the scoring system, to some extent. But then you also have the validity question, how accurate are the decisions. And that's a combination of the scoring system and the technique that's used to do the test.

Q Uh-huh (affirmative). Uh-huh (affirmative).

A So it's a little more complicated. So we know from the reliability that this is an extremely reliable scoring system. It's not subjective in the sense that different examiners will

just not agree.

Q Uh-huh (affirmative).

A If they're properly trained and they're not biased, as I said, they will, without knowing what the outcome should be, come up with consistent results among a set of such examiners. When it comes to validity, it depends upon the -- the studies. But this scoring system has been applied in laboratory studies, and that Table 2 shows that the accuracy rates are on -- on the order of 90 percent in laboratory studies, in those studies that we showed there. And in the field studies where this scoring system has been used, the accuracy rates tend to be around 95 percent for people who are independently verified as guilty and 90 percent for people who are independently verified as innocent.

Q Okay.

A So that validity is very high in those -- it's even higher in those studies than it is in the average laboratory study.

Q All right. Let's move on briefly to countermeasures.

Could you tell us what a countermeasure is?

A A countermeasure is an attempt by the subject, a deliberate attempt by the subject to defeat the purpose of the test.

Q Can you use chemicals to affect the test result?

A Well, people have tried to use chemicals to affect the test results, and the research literature clearly shows that they

are ineffective in -- in producing erroneous --

Q Uh-huh (affirmative).

A -- results on the polygraph.

Q What about physical or mental countermeasures? Talk about those for a minute.

A Well, there are -- there are certain ones that have been studied. Some have been shown to be useless. But the ones that are of concern are physical maneuvers that a person would be trained to use and trained well enough so that they not only apply them appropriately and at the right time, but apply them in a way that they can't be observed.

Q Okay.

A And the things that we found -- and most of this research has been done in my laboratory and also in Dr. Honts's laboratory since he left the University of Utah -- what we've found is that if you carefully train people, and it has to -- the training has to be by somebody who's knowledgeable and they have to receive this training, they can't just do it on their own -- but if you train them to tense muscles in their legs during the control questions --

Q Uh-huh (affirmative).

A -- and not during the relevant questions, and do it so they don't produce big body movements --

Q Uh-huh (affirmative).

A -- and do it so that the examiner can't see them doing it, and that's not too difficult if you give them the proper training.

Q Uh-huh (affirmative).

A Then they can create reactions to control questions in a laboratory setting that are basically indistinguishable to the human eye from bona fide reactions caused by the psychological process you're trying to measure.

Q Could you succeed at countermeasures without training?

A Probably not. I was going to finish. There are other --

Q I beg your pardon for interrupting.

A Maybe I should just finish the -- for completeness. The -- the other physical countermeasure that we've found that can be effective like that is lightly biting the tongue during the control questions. And the mental countermeasure that we've found to be effective is to do mental arithmetic --

Q Uh-huh (affirmative).

A -- during the control questions. Asking a person to choose a number greater than 200 in their mind, and when the control question starts, to start counting backwards by sevens, which is a difficult mental task. And we find that that also produces what appear to be bona fide reactions of the control questions.

Now, to answer your question, can a person do it without

training, we have conducted a whole series of studies designed to ask -- answer that question. And what we found is that you can give people all the same information in written form. We prepared a special book for them, because, you know, there are these "how to beat the polygraph" books that the underground press has on the Internet and things like that. And you can give them all that information -- I mean really good information, not the junky stuff that they can get off the Internet, but from experts. We -- we put the book together and said, "Okay, this is what you do and how you do it, and this is what we want you to do. Take this and -- and read it and study it and come back next week, and you'll take your polygraph." And the examiner gives them the polygraph; they fail.

Q Uh-huh (affirmative).

A They can't implement it on their own without having --

Q Mean --

A -- having somebody sit down and say, "This is how you do it. I want you to do it now. I'm going to read you some questions, I'm going to watch you." And you do this over and over till they get used to doing it, and you watch them and make sure you can't see them doing it. It takes not a long time, but it takes that kind of hands-on training.

We also found in studies -- we went back, and we give subjects questionnaires after our studies, to find out --

Q Uh-huh (affirmative).

A -- what they did and so on. And about 60 percent of our subjects who were not given any countermeasures information on their own decide to try a countermeasure --

Q Uh-huh (affirmative).

A -- you know. Lot of guilty people say, "Well, you know, I got nothing to lose. I'll try this." And they try various things, and they report to us what they've tried. And of those 60 percent of guilty people who try that in our laboratory studies -- we have a published article on that, I think it's one of the exhibits -- none of them -- none of them were able to beat the test.

Q I think you're referring to Defendant's Exhibit M? That's a study you and Dr. Honts did on the effects of spontaneous countermeasures?

A That's correct. And that -- that is one that we compiled. It's -- well, it's four of us, and we compiled the results from a series of studies.

Q Okay. And what --

A And there --

Q -- does that reflect?

A It reflects that if -- if you see -- on page 94 it shows people who reported using countermeasures and people who reported not using countermeasures, and not a single person

that reported using countermeasures produced a truthful outcome; but eight percent of those who said they didn't use any countermeasures actually beat the test. They didn't know why; we didn't know why. But the conscious application of countermeasures by an untrained person is actually counterproductive. They're more likely to fail.

MR. McCOY: I'd ask that M be admitted.

MR. COLLINS: No objection.

BY MR. McCOY:

Q Can -- are polygraphers, people who administer polygraph exams, are they trained to detect the use of countermeasures?

A Well, to a little degree. Many of them think they're trained. Because they're told, well, you can -- you know, sometimes they're told you can detect these things; it's so obvious; there'll be movements on the chart, and this and that. And any time they see a movement or every time they see an alteration or breathing, they say, "Ah, that person's practicing countermeasures."

The fact is that even the most experienced examiners -- and I include, you know, so-called renowned polygraph examiners like Cleve Backster -- these people are no better than chance, often worse than chance, at identifying who was practicing countermeasures and who wasn't. And we've done studies with this, we've shown videotapes to people and asked them to watch

the videotapes and look at the polygraph charts and tell us who's practicing countermeasures, and they often do worse than chance.

And I'm no better than they are. When you have somebody that's trained to do it properly, you can't detect it. And when they're not trained to do it properly, they make a -- a mess there and it's easy to see, and they fail the test anyway, so the countermeasure doesn't matter, because their numerical score says they're deceptive.

Q In your experience with training someone in a countermeasure, how long would that take?

A It took us, on the average, about 30 minutes.

Q Uh-huh (affirmative).

A But, you know, that's giving them -- we give it all, very refined --

Q Actually hooking them up and doing it?

A Well, in one study we attach them to the polygraph, and most of the studies we just went over the questions with them, observed them, had them do it, not attached to the polygraph, and then they went in the same day or a week later and took their polygraph test. Or in one study it was after a month --

Q Okay.

A -- they did it.

Q Does this affect your --

THE COURT: Let's stop and rule on Exhibit M. What is the date of that study?

THE WITNESS: N, Your Honor, or M?

THE COURT: M.

THE WITNESS: M, I'm sorry.

MR. McCOY: '88 is what I see.

THE WITNESS: Is that it -- I -- I'm looking for the -- I could look on my vitae and see. That -- that's probably the easiest way to be sure. Is that Exhibit 1?

MR. McCOY: It is A, yes, the first one.

THE WITNESS: Let me find that. It'll be listed there.

MR. COLLINS: I think it would be after 1987, Your Honor, because there's a reference to an article written in 1987 in the context -- I mean the text, so it appears to be in the late '80s.

MR. McCOY: I think it's '88, actually. We can find out exactly if it's a concern.

THE WITNESS: Let's see. Oh, here it is. It's 1988, yeah.

THE COURT: All right, thank you. Exhibit M will be admitted.

(Defendant's Exhibit M admitted)

MR. McCOY: Thank you.

BY MR. McCOY:

Q With regard to countermeasures, do you think there's any greater dangerous -- danger in the context of countermeasures than, say, someone who is faking psychiatric symptoms or practicing handwriting to kind of deceive a handwriting examiner? Is there any difference?

A The dangers are every bit as great with those kinds of things. I mean, there's some famous studies in the literature showing that university students can be sent to psychiatric hospitals to fake that they're schizophrenic and they almost invariably get admitted with that diagnosis or a similar diagnosis; in fact, some of them had a hard time getting out when they said, "Hey, I'm just doing a study for my professor at Stanford and I'm not psychotic," and they said, "Yeah, yeah, you know, you're paranoid."

Q Uh-huh (affirmative). Uh-huh (affirmative).

A And that is a risk. There's a great risk of people malingering physical symptoms, there's a whole, you know, area of study and tests designed to detect malingering, which is what this is; medical symptoms and so on, books and books have been written, because it's a major problem. And I think actually the -- the risk is greater there, because lots of unsophisticated people seem to be able to do it. They know how to say they've got a pain and this and that. Takes a real expert to try to disentangle this.

And so the risk with -- with people and polygraphs really has to do more with somebody who is a sophisticated person who might have access to special training, such as people working for a -- an intelligence organization, either our country or -- or from other -- other countries. And we know that the Soviets operated a school in Czechoslovakia where part of their schooling was to train their -- their spies to beat American polygraph tests. The Cubans did the same thing.

Q But what's the nature of that? Is that something you can pick up from books?

A I don't know what they were teaching them, because --

Q Uh-huh (affirmative).

A -- of course, that was not very accessible. And if it's been disclosed to U.S. authorities, they haven't made it public, so it's probably classified.

Q Based on your experience, is there any information available in rural Alaska on countermeasures?

A I'd be real surprised. I -- it's -- it's not something you see in the local library. But even if it were, it wouldn't do them any good. The research shows they'd have to have somebody show them how to do it.

Q All right. I'd like to move on to the next *Daubert* factor, which is peer review. Could you tell Judge Roberts what peer review is?

A Peer review is a process by which one's peers evaluate one's proposed work and one's work. So in science, that involves experts in the field looking over the work of other people to decide -- to determine if it meets standards. And depending on what the purpose, you know, would -- would dictate the standard. So if somebody is applying for a grant from a -- say a -- the National Institute of Health or the Science Foundation or the Department of Justice, then you have a panel, and I've served on those panels, that would look at the proposals and evaluate them for their scientific merit and their contribution to the field and their methodology to determine if they merit funding. And there's a very competitive process there.

Q So you've not only served on the panels that select, but you've actually engaged in a peer review process yourself?

A Oh, yeah. Yeah.

Q And had your own work subjected to the peer review process?

A Oh, yes. I mean, you don't get the money just by asking. It's very competitive. And -- and -- and those funds go to the university --

Q Uh-huh (affirmative).

A -- to the individual.

Q All right.

A And then that's one type of peer review. The other has to

do with publications. And when you submit these things for publication, say to a scientific journal like the articles we have been talking about here, what happens is that goes to the editor; the editor -- and I've served in this capacity -- then will select two or three consulting editors to whom the editor would send this for evaluation, and those people would be selected because they're very knowledgeable in this area and have a reputation for being highly competent. And then you have them do a review; they submit it to you; you do your own review as the action editor and then come to some conclusion. Either you reject it or you say, well, "Here are the criticisms; see if you can deal with them, and send us a revision if you want to," or you say, "Well, subject to X, Y, and Z revisions, it will be accepted," or in very rare instances, accepted as is. That's happened to me once in my career.

Q Uh-huh (affirmative). All right. How is a book chapter for scientific publication written? Is that proposed for publication much the same way?

A Well, the process there's a little different. Usually if it's a book chapter, there's an editor or editors of the book. And I've edited a couple books like that myself, and contributed chapters to probably a dozen or so --

Q Uh-huh (affirmative).

A -- at least. And what happens is, you identify the experts that you want to write the chapters for you. And you ask them to write a chapter, you get them to agree, or get somebody else. And then they send you the chapter. Now, as editor, when I've done this, I have typically carefully edited them myself, because I'm very familiar with the area, because that's why I'm editing the book. And in most instances, I've made people write and rewrite and rewrite their chapters till they were satisfactory. Some of them get exasperated with me. I've had the same thing happen when I submit them. And I'm not sure when I submit them to other people, who all does -- at least the editor does, and maybe they have other people, and sometimes they do send the whole thing out to external editors.

And then you get back comments. Often they've got all kinds of scribbled stuff on them and -- and, you know, a written description of things you've got to do, and you've got to add stuff here, and "We don't like this, and we want more over here, and explain more there," and so on. And this goes through a process of usually two or three versions before --

Q And the effort is to get the author to refine his or her presentation to make it as good as possible?

A Well, to make it sound, to make sure they cover the literature adequately and accurately --

Q Uh-huh (affirmative).

A -- and that they're -- what they're writing makes sense. So you have an extra review in that sense.

Q Okay. What I want to do is go through a series of documents here that we've identified to illustrate the peer review process. The Court has already admitted Exhibit B, C, and D. B is Podlesny's study; C is the (indiscernible) crime study, refresh your recollection --

A Uh-huh (affirmative).

Q And D is the Secret Service field study.

A Uh-huh (affirmative).

Q Were those subjected to the peer review process?

A Yes.

Q Okay. That you've just described?

A Yes. D, that form of it is the report to the U.S. Department of Justice, National Institute of Justice, so that was --

Q It's (indiscernible) report after the peer report process?

A Well, that -- well, it was peer reviewed, the application for the grant was. Then this report was accepted after they're looking it over in-house and maybe having other people look at it. And then parts of that have been published in other places that went through a different kind of peer review.

Q Okay. Would you take a look at Exhibit H, please?

A Yes.

Q And would you tell me what that is?

A That is a study that Dr. Honts did in cooperation with the Canadian Police College, Royal Canadian Mounted Police. It's a field study designed to answer a -- a series of questions about the efficacy of polygraphs in the field and the kinds of methods that are useful in assessing that.

Q What conclusions are drawn from the study?

A That polygraphs as they were utilized by the RCMP examiners were highly accurate, again had an accuracy in the mid-90-percent range, and also that you could use things other than confessions as a criterion for ground truth, and still you would come up with high degrees of accuracy.

Q Was this subjected to peer review?

A Yes, it was. In fact, it's another exhibit that is later on -- let's see, it's -- it's Exhibit N, is the peer review journal article in the Journal of General Psychology based upon that study.

Q All right.

MR. McCOY: Ask that H be admitted.

MR. COLLINS: No objection.

THE COURT: It's admitted.

(Defendant's Exhibit H admitted)

BY MR. McCOY:

Q Move to Exhibit I. Could you identify that for us, please?

A Yes. That's a -- a book chapter that I and my colleagues wrote that appeared in a book entitled Credibility Assessment, which was the proceedings of a NATO scientific conference held in Italy in 1988 that I and two of my colleagues co-organized. And that was a presentation on polygraph research and it was submitted to the editor of the book, a John Ewell (ph), and he did all the editing on it, and it was accepted in that form.

Q And again, subjected to peer review?

A Yes, by Dr. Ewell, yes.

Q What conclusions can be drawn from it?

A Well, it describes research from a number of studies that we've already talked about. Probably the -- the Secret Service study, the accuracy studies there, and also the -- where we looked at the similarity between field studies and laboratory studies, and the underlying psychophysiological structure. And it also summarizes the directed lie research that we had done, field and laboratory as I recall.

Q And because it was subject to peer review, folks that had -- or disagreed or dissatisfied with your methodology had an opportunity to complain and address those concerns?

A Possibly. I'm not sure exactly what Dr. Ewell did with regard to that, but this was presented --

Q Right.

A -- first at the meeting --

Q Uh-huh (affirmative).

A -- where everybody was present in one large session and, you know, it was extensively questioned and so on. And there was discussion of it --

Q Did you have to defend it --

A -- at those meetings.

Q -- in effect?

A Well, you always have to defend it. I mean --

MR. McCOY: I'd ask that I be admitted.

MR. COLLINS: No objection.

THE COURT: Admitted.

(Defendant's Exhibit I admitted)

BY MR. McCOY:

Q Have before you J. Could you tell us that is?

A Yeah. That's a first draft of a chapter that I was asked to put together for a two-volume work published by West Publishing for the legal community. The -- the volume -- two-volume work is entitled Modern Scientific Science -- Modern Scientific Evidence: The Law and Science of Expert Testimony. And that was published eventually in this two-volume work, edited by David Faigman and three other law professors. They're all law professors at various law schools. And this is the first typed draft and it was returned to us by Professor Faigman with comments. Comments were addressed to Honts,

because I was in the process of moving at the time.

Q And the purpose of including this exhibit is to illustrate an example of the peer review process?

A Yes. It show -- you know, gives us some --

Q Correspondence between scholars --

A Yes.

Q -- (indiscernible) an article?

A Right. And showing some of the -- you know, the -- the notes and suggestions and things that were made by Professor Faigman. I'm not sure if this was the first draft or a later draft. I'm not -- see, we worked it and reworked it before we sent it to him and then --

Q Uh-huh (affirmative).

A -- it was reworked I think extensively two more times.

Q And ultimately published?

A Yes.

MR. McCOY: I'd ask that J be admitted.

MR. COLLINS: No objection.

THE COURT: Admitted as an example of peer review processing.

(Defendant's Exhibit J admitted)

BY MR. McCOY:

Q Please move to Exhibit K, Dr. Raskin, and tell us what that is.

A That's an article published by Dr. Honts entitled Psychophysiological Detection of Deception. It was published in the journal Current Directions in Psychology, which is published by the American Psychological Society. It's sort of their flagship journal. And he was invited to write this article, but then it was sent out for extensive peer review and revised on that basis.

Q And again, an examination -- an example of the peer review process?

A Yes.

Q Does it discuss the directed lie control test?

A Yes, it does. It has a big section on directed lie control test.

Q And what conclusions are drawn from this study?

A His bottom line, the last paragraph in the directed lie section says: Data from both the field and the laboratory indicate that the directed lie control question is at least as effective as traditional control questions -- meaning probable lies --

Q Uh-huh (affirmative).

A -- and the results from the field suggest that the use of directed lie may reduce the number of false positive errors produced. These results, combined with clear conceptual and psychometric advantages of the DLCT -- the directed lie control

or comparison test -- make a strong case for its use in the field.

Q Okay. And when was this article published?

A 1994.

MR. McCOY: I'd ask that Defendant's Exhibit K be admitted.

MR. COLLINS: No objection.

THE COURT: K is admitted.

(Defendant's Exhibit K admitted)

BY MR. McCOY:

Q Moving to L.

A Yes.

Q And would you tell me if you recognize that?

A Yes, I do.

Q And what is -- that appears to be a Law Review article?

A Yes, North Dakota Law Review. And it's authored by Dr. Honts and a law professor at North Dakota, Bruce Quick.

Q Okay, and what's its purpose?

A To provide information to the legal community about the history and uses of polygraph tests and their accuracy.

Q All right. And --

A And, you know, the questions that are raised about them.

Q All right.

MR. McCOY: I'd ask that L be admitted.

MR. COLLINS: No objection.

MR. McCOY: Okay. We talked about M already --

THE COURT: Well, just a minute, I haven't ruled yet.

MR. McCOY: Oh, I beg your pardon, Your Honor. Excuse me. Excuse me.

THE COURT: Does this relate to North Carolin- -- North Dakota law at all, or is it more general?

THE WITNESS: It's more general than that, Your Honor. It talks -- starts out talking about the history of it and starting with the *Frye* decision and -- and the *Daubert* decision and, you know, lots of different cases, as you see cited in the footnotes. And the main thing is more for the scientific stuff, to present it in a format that would be of interest to the legal community and some of the most recent scientific research.

THE COURT: Thank you. We'll mark Exhibit L admitted.

(Defendant's Exhibit L admitted)

MR. McCOY: Thank you, Your Honor. And I apologize for jumping in so quickly.

BY MR. McCOY:

Q Want to move to Defendant's Exhibit N, and ask you if you recognize that?

A Yes.

Q Tell me what it is and why it's important.

A It's this article we talked about earlier, about the -- the effects of spontaneous countermeasures on polygraph tests and how the data show that people can't on their own just do it and succeed.

Q Has this been subjected to peer review?

A Yes, it was.

Q Okay. And do you know how extensive the peer review was?

A Well, it was a standard peer review by the panel of experts that's used -- was used at that time by the Journal of Police Science and Administration. Normally you're not told who the reviewers are. You're just --

Q Uh-huh (affirmative).

A -- given their comments.

Q Right.

MR. McCOY: I'd ask that N be admitted.

MR. COLLINS: No objection.

THE COURT: Admitted.

(Defendant's Exhibit N admitted)

BY MR. McCOY:

Q Moving to Defendant's Exhibit O. Do you recognize that?

A Yes.

Q And tell us what it is, please?

A That's an article by Dr. Honts called Criterion Development and Validity of the CQT and Field Application. And this is the

study I described earlier, using the RCMP polygraphs to assess the validity of actual field tests in polygraph examinations.

Q Want to make sure we're -- are we talking about N right now?

A N, as in Nancy?

Q Correct.

THE COURT: I thought you said O.

THE CLERK: He said O.

MR. McCOY: I thought I said O.

THE WITNESS: Oh, I'm sorry. I just took the next in line. I'm sorry.

MR. McCOY: All right.

THE WITNESS: Yes --

BY MR. McCOY:

Q Let's move to O. No, let's back up for a minute.

A Okay.

Q We talked about M earlier.

A Yes.

Q What is M?

A M was the one on spontaneous countermeasures that we just described.

Q All right. And then what is N?

A N, you mean?

Q N, N as --

A Yeah. Okay.

Q N, as in Nancy, (indiscernible) --

A That's the one I was just describing by Dr. Honts and the RCMP polygraph examinations.

Q Okay. Let's move to O then.

A O, okay. Modern Scientific Evidence?

Q Yes, sir.

A Yes.

Q Earlier we talked about an -- we offered an example of a peer review process --

A Uh-huh (affirmative).

Q -- which Judge Roberts admitted as an example of that. And I believe that that was J. Would you compare J and -- or explain what happened between J and O?

A Well --

Q Are you with me?

A Yeah, I got you.

Q Yeah, all right.

A That's where I said we had to revise it and rework it, and I think we probably did it a couple of times. And this is the final printed version that appeared in the book.

Q Okay. And what conclusions do you draw -- are drawn by that article?

A Well, it reviews an awful lot of things. I mean, it

reviews most of the things that we've been talking about today, not in quite the same detail.

Q Uh-huh (affirmative).

A And it's written for the legal community. And it does review some other things that we haven't talked about, other kinds --

Q Okay.

A -- of tests that are relevant, and presents a scientific analysis of --

Q All right.

A -- of these things.

Q Which was published after the peer review process --

A Yes.

Q -- that we talked about?

A Right. Uh-huh (affirmative).

Q Okay. Dr. Raskin, I'd like you to sort of quantify the peer review process that surrounds the study of polygraphs. And I don't know how to ask it other than to ask you to quantify it as best you can.

A Well, it's been very extensive and very detailed. Because this is an area that always generates controversy in the public --

Q Uh-huh (affirmative).

A -- as well as in the legal community, as you know, and in

the scientific community. And so there are dozens and dozens of articles published in scientific journals, as well as chapters, books, and, you know, presentations at scientific meetings. And I would say that it's a very, very extensive body of literature that's been peer reviewed. In terms of the area of psychophysiology, I think all psychophysicologists would be inclined to agree that this particular problem has received more attention than any other application of psychophysiology from the scientific community, more research, more publications, more extensive scrutiny and discussion than any other application of psychophysiology except perhaps the broad area of biofeedback, but not at the same level as -- as this.

Q Okay. Any other disciplines that you can compare it with in terms of the level of scrutiny that's been given to it?

A Well, I think it's typical of any area of science where you have some controversy. Look at DNA, for example --

Q Uh-huh (affirmative).

A -- which has been developed, you know, at the level of molecular biology and genetics. That has been a contentious area that's generated a great deal of research, because people have strongly-held beliefs and -- and had major practical implications. And now it's settling down to a certain sort of generally-agreed-upon set of facts where some is, you know, better than other, and so on. And that's -- that process is no

different from polygraph.

Q Does the fact that there's a fair amount of peer review or controversy, does that undermine or make it less valid?

A No, I think in fact, it forces the science to grapple with the applied problems in a way that you don't see otherwise. And I think controversy is -- is healthy in that sense. And as Huxley said, every -- you know, Sir Thomas Huxley said that every -- every advance in -- in natural knowledge has been a fight against the establishment.

Q Uh-huh (affirmative).

A That's how science is. Scientists pretend to be these open-minded people that are just ready to embrace all kinds of new things -- well, embrace anything new that agrees with what they believe. And --

Q Okay.

A -- it's sometimes a major battle. Galileo went through it long ago, and it -- this is just another example of the same thing.

Q All right. I want to move and talk about error rates in -- that have been studied in the science of polygraphy, if I could. Have there been studies that have been conducted to establish the rate of error in -- with the polygraph?

A Yes, and we've talked about quite a few of them as we've gone through these exhibits.

Q Okay. Some of those have been lab studies and some have been field studies?

A Yes.

Q All right. And would you -- what have you determined to be the established rate of error?

A Well, I put together a table which is an exhibit, P.

Q Okay. Is it appropriate? Why don't we turn to that right now.

A Okay. And what I did there is I took as a point of departure the Office of Technology Assessment, OTA, report --

Q Okay.

A -- 1983, which summarized the findings for 14 laboratory studies and 10 field studies that were in the literature at that time. And I've listed there the false negative and false positive rates found by OTA. And it shows in the field studies, one out of ten were false negative --

Q False negative, again, is?

A Guilty people passing the test.

Q All right.

A So those are errors of a guilty person getting by it.

Q Okay.

A And --

Q That was the 1983 OTA study --

A That's correct.

Q -- that's been admitted as E?

A Yeah, I assume -- yes.

Q Yes, that's correct. Right.

A And the false positive rate for the -- for the field studies was 19 percent there. You know, and you see the corresponding rates of 10 and 14 percent for the 14 lab studies that are reviewed. Since that time there have been four major field studies that used better methods --

Q Uh-huh (affirmative).

A -- or, you know, more carefully designed, used better quality examinations, two from the RCMP files, one from the U.S. Secret Service files, and one from the files of Dr. Honts and myself. And what we see there is the combined average false negative rate of five percent. So one out of twenty was wrong on guilty people.

Q Okay.

A And a combined false positive rate of 10 percent, one out of ten on innocent people was wrong.

Q Okay.

A So what this indicates is, not only do the tests have a high degree of accuracy, but it indicates that when you have a truthful outcome, a negative outcome, it's more likely to be correct, you can have more confidence in it, than when you have a deceptive outcome.

Q All right.

MR. McCOY: I'd ask that P be admitted.

MR. COLLINS: Objection.

MR. McCOY: On P, there's some --

THE COURT: Admitted.

(Defendant's Exhibit P admitted)

MR. McCOY: Excuse me.

THE COURT: You said no objection, right? Yeah.

MR. McCOY: I beg your pardon, Your Honor.

THE COURT: I said -- it's in.

MR. McCOY: Thank you.

BY MR. McCOY:

Q There are -- under the section of the table where you have Recent Field Studies, we have presented the Court with some of those studies, have we not?

A We've presented them with three of the four studies.

Q And would you identify the three that have been presented?

A Honts and Raskin, 1988 --

Q Would that be F-2?

A I'll take your word for it.

Q All right.

A It's the one we replaced the page in today, yes.

Q That's right. Good.

A Dr. Raskin, Kircher, Honts, and Horowitz, 1988, and that's

the Secret Service study.

Q Exhibit D?

A D. And Honts, 1996, which is Exhibit --

Q Would that be N?

A N, as in Nancy, right.

Q All right.

A Yeah.

Q And this table, to recap, summarizes the error rates; is that correct?

A That's correct.

Q Want to talk about the error rates that sometimes occur in other forensic areas and compare them with the error rates that have been established with polygraphs. Are you familiar with other types of forensic evidence?

A Yes.

Q Why don't you tell Judge Roberts the other areas that you have familiarity with?

A Well, I'm generally familiar with a lot of different areas, having worked on criminal cases for 23 years and consulted on a lot, as well as having taught psychology and law for --

Q Uh-huh (affirmative).

A -- many years. I'm familiar with the -- the general run of forensic tests. I'm not familiar with a lot of the technical details --

Q Uh-huh (affirmative).

A -- of those, but it's not my area of specialization, you have to be specialized. But I'm generally familiar with those tests and how they're used in actual investigation.

Q And have you as a result of that interest looked at the error rates in other areas of science where the evidence is routinely accepted in court?

A Yes. Yes.

Q What is Exhibit Q?

A Exhibit Q is a part of a larger report that was done at the request of the U.S. Department of Justice, National Institute of Law Enforcement and Criminal Justice, and called the Crime Laboratory Proficiency Testing Research Program. And the team was headed by Joseph Peterson, who is I think still at the University of Illinois, Chicago. He is the chairman of the criminology department there.

Q Does this study identify the error rates in other areas of forensic evidence?

A Yes, it did.

Q And can you give me a summary of the error rates that were identified in these other --

A Well --

MR. COLLINS: I object, Your Honor. Mr. -- Dr. Raskin has been accepted as an expert in the field of psychophysiology

and he's now being asked to, in essence, substantiate or lay a foundation for a document that's not related to his field of expertise. He's going to lay the foundation for his knowledge of the validity of this document; in essence then he's attempting to introduce hearsay evidence which does not fall within his area of expertise.

MR. McCOY: If I could respond. I'd invite the Court's attention to Evidence Rule 703 --

THE COURT: Lay your foundation --

MR. McCOY: Okay.

THE COURT: -- under that.

MR. McCOY: That'd be fine.

BY MR. McCOY:

Q You offered us some testimony this afternoon and this morning about the error rates with regards to polygraphs.

A Yes.

Q Do you have an interest in the error rates in other areas of forensic science?

A Yes.

Q Why is that of interest to you?

A Well, one, I have a general interest, you know, teaching psychology and law; but I have a specific interest in assessing what kinds of techniques based upon science --

Q Uh-huh (affirmative).

A -- are regularly used, how they're used, how they're accepted in the legal community in terms of court proceedings, how they're used by investigators. Many of those are psychologically based techniques. Many of them are not psychologically-based techniques. And --

Q Are you interested in how polygraphs stack up against other criminal --

A Yes.

Q -- other evidence that's routinely admitted?

A I am. In fact, there are specific studies that have done that with regard to comparisons to different types of evidence. And I'm particularly interested in that. And this particular report I was interested in, because I became aware of it when Dr. Peterson himself gave me a copy of it and we --

Q Uh-huh (affirmative).

A -- discussed it in great detail.

Q Uh-huh (affirmative). And why was it of interest to you?

A Well, because it shows the performance in terms of adequacy of these kinds of criminalistics tests that are regularly used in criminal investigation and admitted in court proceedings, and it shows their error rates, which, when one compares that to the polygraph, which has been very controversial within the legal community, it allows you to say to what extent different standards are being applied.

Q All right. Who published it?

A This is a report put out by the National Institute of Law Enforcement and Criminal Justice, a federal agency that was at the time the research arm of the U.S. Department of Justice. The name has been changed to the National Institute of Justice since that time.

Q And is this a document that you've relied on in formulating some of the opinions that you've offered to us today?

A Yes.

Q And is it a document that you will have relied on in offering opinions about the comparative error rates between the forensic sciences?

A Yes.

MR. McCOY: I'd ask that it be admitted, Judge.

MR. COLLINS: Same objection, Your Honor. The document pertains to testing on drugs, firearms, blood, glass, paint, firearms, physical examination for which Dr. Raskin would be asked to validate the error rates of those analysis and then use those to validate his comparison to the polygraph, which is a completely different field. There's no basis for establishing the accuracy of this document, and it would be just the same that if he were to look at the funny papers and use that to validate because he reviewed them, so I don't think there's a foundation laid.

MR. McCOY: Your Honor, he's not asked to validate the accuracy of this report. It's a document that he relies on. Were -- counsel's objections would be well taken were it not for Evidence Rule 703. The facts or data in a particular case upon which an expert bases an opinion or inference may be those perceived or made known to the expert at or before the hearing. If of a type reasonably relied upon experts in a particular field in forming opinions or inferences upon the subject, the facts or data themselves need not be admitted into evidence.

And what -- what's critical here is to establish that there are error rates in other forensic fields. And this is the Justice Department's most recent study on what those error rates were. He's not gone out and independently verified them, but he does rely on them when he compares his own error rates. It's admissible under 703 for that purpose.

THE COURT: It is admissible under Rule 703 for the purposes offered. The witness is not vouching for its validity of the study. It's something he's used in his research. And the Court will consider it that way. This is a motion in limine, this is not something that the fact finder has to decide on its own. So for the limited purpose of this hearing, it's admitted.

(Defendant's Exhibit Q admitted)

BY MR. McCOY:

Q Dr. Raskin, when you were looking for the source -- when you are looking for information about error rates and other forensic areas, where do you look?

A Well, this would be one place. You look at that -- reports that are generated by people in those fields.

Q All right. And would you look, for instance, to the Department of Justice and expect them to be accurate?

A I would hope so.

Q All right. And when they publish a -- an official report, do you -- and unless it's otherwise subject to question, are you prepared to rely on it?

A Yes.

Q All right. And did you rely on this particular report?

A Yes. I've used it in teaching.

Q Okay. And are there other professors that use it in teaching?

MR. COLLINS: Your Honor, I think he's already laid his foundation. The Court's already ruled. Now we're getting into this foundational thing, and he's simply trying to buttress this document.

THE COURT: There may be a little overkill here, Mr. McCoy. Our time is limited.

MR. McCOY: Oh, okay. I'll move on, Your Honor. Thank you. Somehow the fire -- it's late in the afternoon, the

fire's got lit.

BY MR. McCOY:

Q What I want you to do is tell the -- describe what's related in this report and what it reveals to us?

A It reveals to us that --

MR. COLLINS: Your Honor, I'm going to object to the report here. If he's -- he's already made his testimony as to his assessment of the -- of his error ratio comparison between polygraph. Now he's attempting to introduce the document for another purpose.

MR. McCOY: Well, I wouldn't be --

THE COURT: I'll allow him to highlight something in the document at this point.

BY MR. McCOY:

Q What I'm trying to do, Your Honor, Dr. Raskin, and I indulge -- ask your patience. What I'm trying to do is to --

MR. COLLINS: Your Honor, may Mr. McCoy ask a question rather than have a discourse with the witness?

THE COURT: Go ahead and ask the next question.

MR. McCOY: Thank you.

BY MR. McCOY:

Q Dr. Raskin, what I would like you to do is to compare what you've testified the forensic error rate in polygraphs to that of the studies identified by the United States Department of

Justice in Defendant's Exhibit Q, and tell us what you've learned.

A Well, the -- the best summary is in Table 89, page -- numbered page 251, I believe it is, which shows the percent of acceptable responses from these 230-some-odd laboratories that were sent blind samples to evaluate. And what it shows is the range of error, depending upon the type of test that was done.

Q Okay.

A Ranging from the low of 1.7 percent --

Q For what?

A -- for fibers --

Q Uh-huh (affirmative).

A -- synthetic fibers, to a high of 71.2 percent for one of the blood samples, which had to do with distinguishing between human and animal blood. And then, you know, for example, hair samples had error rates that ranged from 28 percent to 68 percent. And when you compare that to polygraph techniques properly practiced, as we've talked about all these exhibits, the polygraph fares in general far better than most of these criminalistics tests that were evaluated in this study.

Q Okay. With your familiarity with some forensic evidence, can you -- other than what's in this report, can you give examples of other forensic evidence that the courts routinely rely --

A Yeah.

Q -- on based on your own personal knowledge?

A Yes. The -- for example, there is a study in the literature by Horvath and Wydacki (ph) -- or Wydacki and Horvath, I take it back -- that compared polygraphs to fingerprints to handwriting identification to eyewitness identification.

Q Uh-huh (affirmative).

A And in that study the polygraph -- fingerprints were 100 percent accurate when they were usable. They set it up to try to produce usable prints, but they only got a very small percentage of usable prints in spite of their best efforts. Those were 100 percent accurate. The polygraph was about 94 percent accurate, as I recall. The handwriting analysis was a little lower than that, or about the same, and the eyewitness identification was only something like 60-some-odd percent accurate. So polygraph fared very well in that study when pitted head to head with these other three techniques. When you compare it to psychological testing, psychiatric diagnosis, you know, interpretations from psychological evaluations, my experience is, and the literature I think supports it and some experts certainly do, that polygraphs tend to be more accurate than the typical psychological diagnosis and inferences that are presented to courts as evidence.

Q All right. We've presented the Court with a copy of Edward Katkin's affidavit at Exhibit R. Tell us what the -- why that's --

MR. COLLINS: Objection, Your Honor. This is a hearsay affidavit prepared in another case, not subject to cross-examination. I don't see any basis for admitting this in this case.

MR. McCOY: I wonder if I could just even try and lay a foundation --

THE COURT: Sure.

MR. McCOY: -- before I get an objection.

THE COURT: Sure.

MR. McCOY: All right, thank you.

BY MR. McCOY:

Q First of all, do you recognize Defendant's Exhibit R?

A Yes.

Q What is it?

A It's a -- it's a -- an affidavit submitted by Professor Edward S. Katkin in the case of *Commonwealth of Massachusetts versus Louise Woodward*.

Q Okay. And why is it -- oh --

A And that was 1997, I believe.

Q Okay. And who was Louise Woodward?

A Louise Woodward is a defendant in a case that became known

as the Nanny case --

Q Uh-huh (affirmative).

A -- in Cambridge, Massachusetts, and is still a matter of some public controversy.

Q Do you know Edward Katkin?

A Yes, I do.

Q And have you served with Edward Katkin in the past?

A Yes, I have.

Q Is he a person that you rely on and respect?

A Yes, I do, very much so.

Q Would you tell Judge Roberts what committees or what contacts you've had with him professionally where you've actually served with him?

A Well, I've known Professor Katkin for 33 years through the Society for Psychophysiological Research. I've known him when I served on the board of directors and as a member when he was president of that society, as well as in many contacts within that society: editorial reviewing, research meetings --

Q Uh-huh (affirmative).

A -- the whole -- the whole range of activities. And I also know him from our interactions when he chaired the Office of Technology Assessment National Advisory Panel on the polygraph study, where he chaired it and I was a member, and I had extensive interaction with him there. And I continued to

interact with him in a personal and professional way.

Q All right. Why did we include his affidavit here?

A Because Professor Katkin is very knowledgeable about polygraphs, although he is not -- he has not done specific research himself on polygraphs, per se. He uses polygraphs in his research --

Q Uh-huh (affirmative).

A -- as a psychophysicologist. He had been very interested in the problem and chaired the OTA panel because of his knowledge and expertise and also because he is not what we might call a player in the controversy.

Q Uh-huh (affirmative).

A He was an independent person. So that's why he was chosen. He's a person of great stature in the field. And that was in 1983 that he chaired that. And in 1997 was the first time he finally decided that he felt it was time for him to take a public stand --

MR. COLLINS: Your Honor, may we have -- I renew my objection as to the hearsay, as to the relevance to this proceeding. This is an affidavit prepared in a case. It does not fall within the (indiscernible) --

THE COURT: I understand your objection. So far he's still attempting to lay the foundation and hasn't offered it formally for the ruling yet. It's not in. Let's --

MR. COLLINS: I believe he was attempting to, that's why I made my objection at that time, Your Honor.

THE COURT: I have to hear it to rule on it.

MR. McCOY: Yeah. I hadn't. Counsel's mistaken.

BY MR. McCOY:

Q All right. Has Professor Katkin taken a public position on the admissibility of polygraph evidence?

A Yes, he has.

Q And is that different than the position he took when you served with him on the OTA?

A At that time he hadn't expressed a public position. This is his first time that he formally expressed a public position, and this was done under oath.

Q Do you -- the fact that he has expressed a position and the fact that he's expressed that position under oath, is that something that you would rely on in formulating the opinions that you've offered here today?

A Yes. It certainly goes to the opinions of important leaders in the field about the validity of polygraphs and also about his expertise in terms of other types of psychological evidence that's normally admitted with which he is extremely familiar and expert.

Q All right. And you've -- we have offered a lot of literature to the Court this morning and this afternoon. And

have you relied on that literature just like you rely on this affidavit?

A Yes.

Q All right.

MR. McCOY: Your Honor, I'd ask that it be admitted.

MR. COLLINS: I object, Your Honor. This is -- Dr. Raskin testified to his conversations with Dr. Katkin. He did not testify that this affidavit, which is not certified as a court document, is something that he has relied upon. He's relied upon conversations with Mr. Katkin.

BY MR. McCOY:

Q Well, let me just ask the question. Do you rely -- in addition to your conversations, did you read the affidavit?

A Yes, I did.

Q Did you rely on the affidavit?

A Yes, I have.

Q Does it support the positions that you want to offer to the Court here today?

A Yes, it does.

MR. McCOY: Your Honor, I'd move that it be admitted. This is -- we're not in front of the jury here, Judge.

THE COURT: All right. I certainly have no problem admitting the testimony of Dr. Raskin. 703 allows an expert opinion be based on information such as this affidavit. It

doesn't have independent evidentiary value, per se; I mean, it's not a published document, it's not subject to cross-examination by the author of it. As one of the resources he relies upon, I'll accept it in that manner, but not as an independent exhibit.

MR. McCOY: And that's as is -- as it is offered under 703.

THE COURT: For that limited purpose, it's admitted.

MR. COLLINS: The exhibit or the testimony?

THE COURT: Well, the exhibit's limited to something he's relied upon. But it doesn't have independent value in and of itself. So it's admitted for the purpose of this hearing.

(Defendant's Exhibit R admitted)

MR. McCOY: Madam Clerk, could I inquire if Q was admitted?

THE CLERK: It was.

MR. McCOY: Okay, so we're (indiscernible). This is R.

BY MR. McCOY:

Q Why do you choose to rely on Dr. Katkin's affidavit, sir?

A Well, there are different parts of it, and the answer's a little different for different parts.

Q All right.

A One part of it has to do with his comparison of

psychological testimony, and to -- to the polygraph test.

Q Okay. Could you identify where in the affidavit that he's making that comparison?

A Yes. I think this is in number 5 on page 5, where he talks about, "As a scientist and practitioner in the field of clinical psychology, I am aware of the widespread forensic use of various types of psychological and psychiatric examinations, including the use of standardized diagnostic tests to determine whether persons involved in criminal cases suffer from a mental disease or defect, or are predisposed to be repeat offenders. These tests also purport to identify persons who are malingering or attempting to deceive the examiner with respect to their mental health. I am also aware...there are data, generated by field or laboratory studies employing scientific testing methodology, demonstrating the reliability and scientific validity of the results of such diagnostic examinations. It is my opinion that the body of empirical data supporting the scientific validity of polygraph test results is as trustworthy as the body of scientific data commonly relied upon as the basis for the forensic use of diagnostic examinations to detect psychological defects."

I find that very important to me, because Dr. Katkin is an eminent authority in that field.

Q Uh-huh (affirmative).

A I am not. I'm familiar with it, but I would not pose as an authority by any means. So it's important to me that when an authority such as Dr. Katkin, who is a practitioner in that field, says polygraphs are as reliable as those, I take that as being very important --

Q All right.

A -- statement. The other part has to do with, of course, his discussion of polygraph techniques themselves and the scientific basis. And I take his position on that very seriously, because he is an independent person; that nobody can claim that Dr. Katkin has a vested interest in the outcome, as is sometimes claimed about proponents or opponents of polygraph. Dr. Katkin is a very independent person of great scientific and ethical stature. And so I feel his statement is also very important in that regard.

Q All right, Dr. Raskin, I'd like to talk about the community -- the relative -- relevant scientific community and the degree of acceptance that polygraph examinations have within the relevant scientific community. So I think I'll start by asking you, what is the relevant scientific community for the evaluation of polygraph examinations?

A Well, it's those scientists who are reasonably familiar with the methods, procedures, techniques, and scientific findings with regard to polygraphs. That would include members

of the Society for Psychophysiological Research, because that's the parent science. That would be the most clearly identifiable group. There are also people that you would probably find in the American Psychology Law Society, Division 41 of the -- of the American Psychological Association, who are very interested in psychological evidence and are quite familiar with polygraph techniques, because a lot has been published in their journal as well as presented at their scientific meetings.

Q Uh-huh (affirmative).

A Those I would think would be the two most important groups.

Q Okay. Have efforts been made to determine what the degree of acceptance among the relevant community is of polygraph examinations?

A Yes.

Q And could you tell us what efforts have been made?

A The first formal effort was done by the Gallup organization, the Gallup polling people, in 1982, in the context of a big civil case in New York. And --

Q Okay. Would you tell us why the poll was commissioned and what happened?

A Well, it was commissioned because Dow Jones Incorporated, the Wall Street Journal, was interested in getting a polygraph admitted as part of their defense against a libel suit.

Q All right.

A And the reporter had taken a polygraph test about his sources or something like that. I can't remember the specifics.

Q Uh-huh (affirmative).

A And so the -- they employed the Gallup organization to do a scientific poll of members of the Society for Psychophysiological Research, which was conducted in 1982.

Q Uh-huh (affirmative).

A And they sampled, as I recall, one-fifth of the membership by telephone and asked them a series of questions in a carefully-constructed poll to determine their attitudes and knowledge about polygraphs.

Q Is their survey reflected in Defense Exhibit S?

A Yes.

Q All right. Why don't you describe what it tells us.

A Well, it tells us how they did the survey, and then the -- the bottom-line question is shown on page 157 of that report in Table 3. After asking a -- a series of questions, they were then asked a question with a preamble. Well, actually the question is listed at the bottom of page 156. All respondents were then asked, "Which one of these four statements best describes your own opinion of polygraph test interpretation by those who have received systematic training in the technique

when they are called upon to interpret whether a subject is or is not telling the truth?" And they were given four options: "It is a sufficiently reliable method to be the sole determinant"; "It is a useful diagnostic tool when considered with other available information"; "It is of questionable usefulness, entitled to little weight against other...information"; and "It is of no usefulness." And Table 3 now tabulates the -- the results in terms of numbers of people responding. And the important column would be the ones with doctoral degrees.

Q Okay.

A And the -- the results in terms of individual responses are tabulated there. If you convert those two percentages, what it comes down to is, one percent said it was sufficiently reliable to be the sole determinant; 62 percent -- oh -- oh, there is a percent column here, I'm trying to remember.

Q I wonder if it's on page 158 --

A That -- it's right there. It's right next to it --

Q I'm sorry.

A -- I -- right next to the number. I didn't notice it.

Q Okay.

A Yeah. And 62 percent chose alternative B, "It is a useful diagnostic tool when considered with other available information." One percent refused to use the categories and

put between B and C. There's always some psychologists that refuse to follow their instructions. And then C, 34 percent said it is of questionable usefulness, entitled to little weight against other available information. And only one percent said it was of no usefulness.

Q So what does this tell us about degree -- the degree of acceptance among psychophysiologicalists in 1982?

A Well, what it tells us is a randomly-selected sample of one-fifth of the membership had a generally favorable attitude toward polygraphs. Sixty-three percent said it was at least a useful diagnostic tool to be considered along with the other information.

MR. McCOY: Okay, I'd ask that Defendant's Exhibit S be admitted.

THE WITNESS: Only one percent said it wasn't useful.

MR. COLLINS: No objection.

THE COURT: Admitted.

(Defendant's Exhibit S admitted)

BY MR. McCOY:

Q Moving to Exhibit T, would you tell Judge Roberts what that is and how many parts there are to it?

A Exhibit T, well, it's in two parts here. The first part is three pages that constitute a presentation made to the Society for Psychophysiological Research on a more recent survey that

was conducted in 1993 of 450 randomly-selected members of the Society for Psychophysiological Research. And the other part of it is the master's thesis conducted by Susan Amato, which is the basis for the briefer version presented at the meetings.

Q And now, does there appear to be a change in the level of acceptance between S and this particular T?

A Well, if you refer to Table 1, which is the third page in, the last page of the first part of this exhibit --

Q Yes, sir.

A -- Percent Survey Responses, they, among other questions -- and they ask more questions than the Gallup survey did -- but they ask those four basic questions, those bottom-line questions, the same ones in the same way. And when you look at the overall responses, they're almost identical to what they were in 1982. But when you break out those who identified themselves as highly informed --

Q Uh-huh (affirmative).

A -- and that's really the operative group, not people that don't know much about it --

Q Right.

A -- because everybody's got an opinion.

Q Right, right.

A But those who say, "Look, I'm informed. I've -- I've read, I've studied this problem, I know about it," when you look at

that, you find that there's a much higher degree of acceptance among the highly-informed scientists. It goes up to -- from 60 percent who say it's a useful diagnostic tool to 80.5 percent who say it's a useful diagnostic tool, and a few more who say it's sufficient to be the sole determinant. So when you combine those that have the very favorable opinion, it's now up to 83 percent among the highly-informed. Whereas in the Gallup survey when they did a similar type of breakdown, there wasn't a difference between the highly-informed and the others.

What this would reflect is that the opinion of those well-informed has increased in the positive direction, and that's probably due to a lot more research in the intervening period. You have --

Q And this is the -- when was the Amato survey conducted?

A In '93, so it was the -- what, '82 to '93. So it's 11 years later.

Q All right.

MR. McCOY: I'd ask that T be admitted.

MR. COLLINS: No objection.

THE COURT: Admitted.

(Defendant's Exhibit T admitted)

BY MR. McCOY:

Q Now, since the Amato survey, do you have an opinion about the degree of acceptance as among the relevant scientific

community since then?

A You mean -- you mean what's happened since then?

Q Yeah, since -- I guess '93 was --

A Well, there's -- there's another survey that was done by Iocona and Patrick --

Q Uh-huh (affirmative).

A -- which produces somewhat lower numbers --

Q Uh-huh (affirmative).

A -- but that survey is a matter of great controversy, because there's a real question about the integrity of the survey, the way it was conducted, the way the data had been analyzed. There are many things that we have in publication and discussed with the editor of the journal in which it was published, and they have been forced to provide even minimal materials in court proceedings, which they've reluctantly done, but they won't provide the data that is required by the APA ethical standards for independent scientists to evaluate the questions and whether they were analyzed properly. So their reluctance to abide by the ethical standards of the science and the profession, combined with obvious biases in the way the questionnaire was constructed, administered, and interpreted, render that survey very suspect, and I don't think one can rely on it.

Q All right. The last *Daubert* factor that we should talk

about is the makings of standards. Can you tell me what the Polygraph Protection Act is of 1988?

A Well, that was enacted by the Congress and signed into law by President Reagan in '88 because of the widespread misuse of polygraphs in our country, forcing millions of people over a period of years to take polygraph tests to get jobs, to keep jobs, pry into their private lives, their religion, their political affiliations, using them as a basis for discriminatory hiring practices, a lot of things, and very distressing for many people. And so the Congress in its wisdom drafted a legislation -- I think I described my role in that earlier for the -- for Senators Hatch and Kennedy -- and it made most of that illegal. It -- it put about, I would say somewhere between 80 and 90 percent of the polygraph examiners out of business, because they were making their living doing that kind of thing, the private examiners. And it was very questionable; these were 15-, 20-minute tests, and the test -- the technique was never designed to be able to do that.

Q Are there organizations that maintain standards for the administration of polygraph exams?

A Yes.

Q And would you identify them for us?

A Well, first of all, you have the licensing bodies in states. I don't know exactly how many states now require

licensing. At one time it was somewhat over 20. But due to Sunset laws, I think it's probably down to the teens somewhere.

Q Uh-huh (affirmative).

A But those that have licensing regulations do maintain standards. Alaska does not have one. But the -- I'm -- I'm licensed in Utah and New Mexico, for example, that do have stringent licensing standards. So that's one way that it's maintained. Another is by national organizations, one of -- and also the federal government.

Q Right.

A Federal government has their own certification procedures within each agency, so they have to meet certain training requirements, they have to meet continuing education requirements, and so on, just like the licensing acts do in the nongovernment sector. And then you have the American Polygraph Association, which is the largest group of professional polygraph examiners in the country. And they have regulations, procedures that are standards for polygraph training schools.

Q Uh-huh (affirmative).

A So they have established what has to be taught, the qualifications of the faculty, the kinds of follow-up that has to be done for people to be accepted and graduated from these polygraph training schools, as well as for the -- the -- the curriculum itself.

Q Do they actually engage in an accrediting process?

A Yes, they do. They have a very active one. They have a huge manual for doing this, and it's a very complex process. So it's developed in great part by Eric Holden, who chaired that committee and then was the president of their association for two terms. And it continues. I mean, the government schools have to be accredited by them also. They -- they accredit the -- the Canadian Police College and I believe the -- the Department of Defense school also. And so that's another way of maintaining standards, although they don't -- do not maintain standards beyond that except for members of their own association. And that's a small percentage, I think, of the total number of polygraph examiners.

Q What is the American Association of Police Polygraphers?

A It's another polygraph group composed of people who are related somehow to law enforcement who are polygraph examiners.

Q And do they attempt to maintain industry standards?

A I believe so, but I don't think they have an extensive a program as the American Polygraph Association. But many of them belong to both.

Q All right. You have before you Defendant's Exhibit U. Could you just tell us, it's a -- tell us what these documents represent and why we've presented them to the Court?

A Well, these are examples of -- the first page shows who the

APA -- American Polygraph Association accredited schools are at -- at that time. I think since then, one or two of them may not even be operating anymore.

Q Uh-huh (affirmative).

A And it includes on the second page the three federal schools. And actually, the CIA school now I think has -- I think they're now being trained by the DOD --

Q Directly.

A -- and they're not running their own school, right?

Q Uh-huh (affirmative).

A Then, you know, it's more that about the schools and who the directors are, and so on. And then in this material they have documents, the -- the -- the accreditation requires, and the manual for accreditation, which is 63 pages long.

Q Which is what a school, if it wished accreditation, would have to satisfy?

A Yes. They'd have to do all that, and then there are appendices to that. And then -- then there's a school inspection manual for the school inspectors to use. They have standards and ethics, you know, guidelines in here. This is -- let's see, what else. That -- that's pretty much what this is, and this is -- lays out these -- as of this date what their procedures were on their requirements. They probably have an updated version; I haven't seen it recently.

Q Okay. Is this an attempt to create uniform standards for the industry?

A Yes. They've been trying to do that, but of course, doing that on a nationwide basis is a large undertaking.

Q All right. What kind of -- could you briefly outline the training that you receive if you attend an accredited polygraph school?

A I think now the -- the schools are required to be either seven or eight weeks long, at least. I think most of them are eight. The federal school and the Canadian school are 12 plus two weeks of field placement. They include some -- minimum of some 380 hours of classroom instruction and training. And it covers a wide range of topics for -- ranging from the history to the psychophysiology to the research and application, the various techniques, question formulation, interview techniques, scoring of charts, how to operate the instruments. The full range of things that a polygraph examiner has to do.

Q And you've indicated that the United States Government trains polygraph examiners?

A Yes. They are the largest trainer of polygraph --

Q All right.

A -- examiners, I think.

Q Would you compare the training that a government polygrapher receives and compare it with that with -- that you

might receive from an accredited private polygraph school?

A I think the major difference is that the -- the government school's a little longer. It's maybe four weeks longer than the private schools.

Q Uh-huh (affirmative).

A They have, you know, government people teaching the school -- the classes, whereas the private schools typically have a director and then they have faculty that are often drawn from universities as well as former government people teaching those classes. So the -- the quality of instruction is probably similar except that the government school probably has a bigger book of rules for how to do it --

Q Right.

A -- being a government institution. The -- the selection process is a little more, you know, different because the government people select their own people from their own ranks. The private school's people apply and then they pay to go to those schools, but they have to meet certain standards. There's a great deal of similarity, I think. Some are better than others. You know, they vary like any schools would.

Q All right. Like to ask you just a few additional questions, then we'll be done here. How many times have you testified in court on a polygraph issue?

A I think over 150 times.

Q And how many times have you testified in front of juries?

A About 50 times, I think.

Q All right. Have you testified in other areas offering psychological expertise in areas other than the polygraph?

A Yes.

Q And would you tell us what those areas were?

A That's primarily on interview techniques and investigative procedures in child sexual abuse cases.

Q All right.

A I've testified in that area probably, I don't know, about 30 or 40 times.

Q Is there something about a polygraph examination that suggests to you that it can't be cross-examined?

A No. I've been pretty rigorously cross-examined many times, and I'm sure that that'll happen here, so it's --

Q All right.

A -- just standard procedure.

Q What are the subjects of proper cross-examination for a polygraph examination?

A When it's --

MR. COLLINS: I think that he's asking for an opinion on a legal issue, of which Dr. Raskin's not an expert, Your Honor. He can testify to his own experience, but --

THE COURT: What did you ask him?

MR. McCOY: What I'm trying to do is have him explain the areas of cross-examination of the polygraph. I want to eliminate this concern that it has magic to the jury and that they'll be overwhelmed by it. That's where we're going.

THE COURT: You may proceed.

MR. McCOY: Thank you.

BY MR. McCOY:

Q You've testified in front of juries 50 times; correct?

A Approximately, yes.

Q About polygraph results?

A Yes.

Q All right. And has -- what have been the subjects of cross-examination that you've been subjected to?

A Oh, just about everything that we've talked about, except not in such detail about scientific things, but --

Q Right.

A -- and not about things that have to do with legal issues. But more about how the test is conducted, how -- how this particular test was conducted, about the charts themselves, the recordings, the findings, the interview, the tape, what's on the tape, you know, the discussions, the -- the interpretations, you know, the questions. Just about everything there is about a polygraph test; the instrumentation.

Q In your experience, have the juries had any difficulty understanding either your presentation or the cross-examination?

A Well, I think it varies some, but generally I think it's something that they all form opinions on, and they form their opinions based upon what they hear, but probably they have some opinions also. There are going to be some jurors that are confused about any testimony, I think, and there are going to be others that understand all testimony. I don't think polygraph is at all peculiar in that regard. The jurors seem to be interested. That's been my general impression. And I've talked to lots of jurors afterward and attorneys I've worked with have systematically interviewed jurors afterward, and in general I think they report that it's been helpful and interesting. Sometimes they accept it, sometimes they reject it, and they --

Q Uh-huh (affirmative).

A -- they form -- they make up their own minds.

Q Have there been any scientific studies which address the question of jury confusion and polygraph evidence?

A Yes, there's a whole series of them which I have described in my Law Review article that was appended to my affidavit and also that Dr. Honts has talked about in publications. And I think that my -- my affidavit also describes some of those

studies. There -- there are jury simulation studies, mock jury studies, studies of actual jurors. There's -- there are surveys of jurors who deliberated in actual cases, and there are surveys having to do -- of lawyers on -- both prosecutors and defense attorneys, in terms of their experience of actual cases and --

Q And --

A -- what they felt.

Q And what have these studies disclosed?

A They've disclosed that as one might expect, juries act independently. They can accept the evidence; they can reject the evidence; they sometimes come up with decisions consistent with the polygraph; sometimes they come up with decisions that are contrary to the polygraph; sometimes they report they completely ignored the polygraph, they didn't feel it was helpful to them.

Q All right.

A So it's probably like any other form of evidence in that regard.

Q All right. You have before you Defendant's Exhibit V.

A Yes.

Q Would you tell me what that is and why it's important?

A Well, this is a letter from Dr. Barland, whom we talked about earlier, who when he wrote this letter had job changed to

chief of special projects at the Department of Defense Polygraph Institute. And it describes -- it's a letter written to an attorney helping her with information that she requested, which describes the extent of use of the polygraph by the federal government, Dr. Barland's estimate of how much they spent on salaries, just straight salaries for polygraph examiners in the federal government. Not -- you know, like I said, includes CIA. And also, that -- the Department of Defense Polygraph Institute position about properly-administered exams by a competent federal examiner, that the accuracy of the decisions is at least 90 percent. And then he attached to this his outline that he uses for teaching people, government examiners, how to lay a foundation to get a polygraph admitted in court.

Q How to lay a *Daubert* foundation?

A Yes.

Q All right.

MR. McCOY: I'd ask that V be admitted.

MR. COLLINS: No objection.

THE COURT: Marked, admitted.

(Defendant's Exhibit V admitted)

BY MR. McCOY:

Q As -- of your own knowledge, how extensive is the federal government's reliance on the use of polygraphs?

A Very extensive.

Q Does the F -- does the Department of Justice use it?

A Yes, the FBI has. The last count I heard from the director of that program was 82 polygraph examiners.

Q How many exams a year?

A I think it was on the order of five or six hundred exams a year, I think, in criminal cases, and then more I think in their internal operations.

Q All right. And what does the FBI rely on the polygraph for?

A Well, of course they utilize it for screening people for security purposes. They use it in assessing witnesses in cases who may be cooperating witnesses, to determine whether or not they're telling the truth and they should use them as witnesses. They use it on suspects for the purpose of finding out if they're telling the truth or lying and also for eliciting confessions.

Q Have suspects been released based on polygraph results that have been administered -- polygraph examinations that have been administered by FBI agents?

A Oh, yeah, and the example in point is the Oklahoma City Bombing case. James Murphy, who heads the polygraph program for the FBI, I think personally examined about 40 people who were suspects of various sorts in that case, and they

terminated their investigation on those people based upon those polygraphs.

Q Who is James Murphy?

A He's the head of the FBI polygraph program.

Q Has he testified about the results of polygraph examinations in front of juries?

A Yes, I've seen him testify in court.

Q To what extent have you worked with federal and local law enforcement agencies and had them rely on your test results?

A Well, over the years I've worked with quite a few federal and local law enforcement agencies and done work for the U.S. Attorneys' Offices in various places and prosecutors, you know, state and local prosecutors in various places, and police departments, and --

Q And have you assisted in training local law enforcement?

A Oh, yeah --

Q All right.

A -- for many, many years. And federal.

Q Have you been asked by federal agencies to help them get polygraph results admitted in federal criminal trials before?

A Yes.

Q Who has asked you to do that?

A I was asked once by the U.S. Secret Service to do that. I've been asked recently by -- two different U.S. Attorneys

from the Department of Justice in Washington consulted me about that. Those matters are pending.

Q Uh-huh (affirmative).

A Did you say federal?

Q Yes.

A Trying to remember if there have been others. I've -- I managed to evaluate, and it may have been done that I looked at them but couldn't be helpful. I -- I just don't recall over the years.

Q All right.

A They usually have their own people, you know, like they would use somebody like Dr. Barland normally because he's on the federal payroll and so it's of no expense to them.

Q All right. Lastly, we have Exhibits W and X. Could you tell us what those are?

A Let's see. W is my affidavit that was referred to with regard to this case and the poly- -- the foundational issues as well as, you know, the specific polygraph and summary of that that I conducted in this case. And then there are three attachments, one of which is now Exhibit A, I believe, my curriculum vitae --

Q Uh-huh (affirmative).

A -- and then there are two other attachments. There's my Utah Law Review article that discusses a lot of these things

and specifically some of the issues to which I made reference in my affidavit, as well as a book chapter that I authored on polygraph techniques that's attached to this that also describes a number of the things that we've talked about, about polygraphs.

Q All right. And obviously, the whole reason we're here, did you conduct a polygraph examination of Ms. Constance M. Walker?

A Yes, I did.

Q And when did you conduct that examination?

A On the 5th of December 1998.

Q And where was it?

A Was conducted at your offices.

Q All right. What kind of a polygraph examination did you conduct?

A Directed lie comparison test.

Q And what was the purpose that you conducted this examination for?

A To assess Ms. Walker's truth or deception with regard to the allegations that she had stolen money from the Holy Cross Post Office while she was the postmaster of that office.

Q Now, the techniques that you used in administering the December 5th, 1998 test, are those the techniques that we've been discussing today?

A Yes, the directed lie techniques, not the probable lie,

but --

Q Right. And are they based on scientific principles and theories that we've discussed today?

A Yes, they are derived from those.

Q Okay. Has the technique that you used in administering the test to Ms. Walker, has that technique been subjected to scientific research?

A Yes, it has.

Q Has that technique been subjected to peer review?

A Yes, it has.

Q All right. And has that technique been accepted in the scientific community?

A Yes. Excuse me.

MR. McCOY: Those are the questions I have, Your Honor. I think I would ask for a 10-minute break and then we can begin cross.

THE COURT: We'll take the mid-afternoon recess for 10 minutes.

THE CLERK: This matter is in recess for 10 minutes.

(Recess at 3:29 p.m., until 3:40 p.m.)

THE CLERK: His Honor the Court, this United States District Court is again in session. Please be seated.

THE COURT: Okay.

MR. McCOY: I just have a housekeeping matter. I

mentioned this to Mr. Collins. Madam Clerk was kind enough to indicate that some exhibits were not admitted. I believe the parties agreed that they should all be admitted. F2 is the one where we replaced the page.

THE COURT: Yes. F2, I thought I ruled on it. It is admitted, yes.

MR. McCOY: Okay. Just for purposes of the record, CC is the chart that we've been using. I --

THE COURT: That was never offered.

MR. McCOY: Just to make the record clean, I'm going to offer it.

THE COURT: Is that the same as what's in here?

MR. McCOY: It is indeed, yes.

THE COURT: All right. And you haven't gotten to X yet to offer that.

MR. McCOY: And I was -- and I intended to offer W and X, and Madam Clerk advises me that O, U, and V were not admitted.

THE COURT: V is admitted, I marked it admitted.

MR. McCOY: All right. How about O, Judge?

THE COURT: I don't show U admitted.

MR. McCOY: Okay. If I didn't offer it, I intended to offer it. And my recollection actually was that I offered it; it was not opposed.

THE COURT: What's the government's position on O and U?

MR. COLLINS: I have no objection to this -- we stipulate to the admission of the -- whatever --

THE COURT: Very well. Mark --

MR. COLLINS: -- exhibits are contained in the notebook.

THE COURT: We'll mark those Exhibits O and U. All right. And --

(Defendant's Exhibits O and U admitted)

MR. McCOY: And that would include -- okay, so that would include all the exhibits in the notebook.

THE COURT: All right. Then -- and W and X, those coming in as well?

MR. McCOY: Yes.

THE COURT: Based on the testimony. I think there's sufficient -- so we'll mark those, W and X, admitted.

(Defendant's Exhibits W, X, and CC admitted)

MR. McCOY: Thank you very much.

THE COURT: Ready.

MR. COLLINS: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. COLLINS:

Q Good afternoon, Dr. Raskin.

A Good afternoon, Mr. Collins.

Q Want to begin with examination of the theory underlying

polygraphy. The theory is that individuals without control over their own blood pressure, breathing rates, sweat, and finger -- or blood to the finger, will exhibit reactions if they are confronted with a situation that poses some kind of fear upon them; is that correct?

A Well, some sort of psychological threat. It could be fear, it could be just something that makes them apprehensive; not fullblown fear.

Q You are well read with regard to the topic of lie detection; correct?

A I think so.

Q And you know somewhat of the history of mankind's attempt to develop a test, if you will, to determine whether or not a person is telling the truth or is lying?

A Yes.

Q And one of the very earliest forms of lie detection was filling the subject's mouth with rice and having them spit out as much as they could, and if they couldn't spit out the rice, then they were presumed to be guilty?

A Well, not quite. They were asked to chew it up and then they were asked to spit it out. And if the rice was relatively wet, they're presumed to be not guilty, but if it was relatively dry, they're presumed to be guilty, because anxiety and fear inhibits the flow of saliva, according to that theory.

Q So it was the belief the digestive process -- well, they didn't know that, but they believed you couldn't spit?

A Yeah. You get a dry mouth when you're anxious, yeah.

Q And another type of test was the application of a hot poker to the tongue; correct?

A Yeah, there are all kinds of ones, yeah. And again, the dry tongue burns and the wet tongue doesn't. The same principle.

Q And throughout history there have been other kinds of lie detection: the dunking chair; if a witch sank and drowned, she was a witch -- a woman drowned, she was a witch?

A Yeah.

Q Or if she floated, she was a witch?

A Right.

Q If she drowned, she was innocent?

A Right. I think -- and now apply it to warlocks also.

Q The -- equal opportunity?

A Right.

Q At the same time though, there was another attempt to develop a system of assessing truth; I don't know exactly when it began, but I would say on a different path, correct?

A Well, I'm not sure what path you're talking about. There are lots of paths.

Q One of the systems was the development in the Anglo -- the

English system of jury system, a jury of peers?

A Hmm, I suppose you could label it that way. I thought it was to determine guilt and innocence.

Q And one of the aspects of the jury system, the trial, was -- it was an adversarial process? Witnesses were called --

A I suppose. In fact, the earlier version was to hire somebody to be your stand-in adversary and they used to have jousting matches and swordfights and things --

Q That's correct.

A -- like that, without a jury. It was just to see who -- who's standing, get to kill who's standing, because that way you don't get hurt yourself. And then it moved from that to -- then I think that had something to do with the evolution of the adversarial system.

Q And part of that adversarial system in the development of trying to determine the truth was, one, the exclusion of hearsay?

MR. McCOY: Your Honor, I'm going to object as -- on the grounds of relevance and beyond the scope, not relevant to the *Daubert* hearing, you know, what the history of the jury system was. That's not relevant.

THE COURT: The Court will allow broad latitude. And I suppose we've heard a lot of lecture and history on the subject so far today, but I don't think we need to go back quite this

far and make a school course out of it. I will correct one point that was mentioned here, and that is, the jury determines whether the government has proved a person guilty, or else then they're not guilty as proved.

THE WITNESS: Yes, Your Honor.

THE COURT: In other words, they're not proved to be innocent. It's guilty or --

THE WITNESS: Or not guilty.

THE COURT: -- not proof or not guilty, lack of proof.

MR. McCOY: And it illustrates why this is beyond his competence, Your Honor. And I think -- I don't mean that in a disrespectful way, but I -- that's the purpose of my objection.

THE COURT: Let's see if we can move it along a little better.

MR. COLLINS: Yes, Your Honor.

BY MR. COLLINS:

Q Let's go back now to the physiological underpinnings of the theory underlying polygraph. A person could exhibit sweating palms, rapid or an increase in blood pressure, increase or rapidity of respiration, and they wouldn't necessarily be confronted with detection of deception? For instance, a young boy at a --

A Oh.

Q -- dance sees a girl that he's interested in dancing with,

but can't muster up the courage: begins to sweat, begins to lose his breath a little or breathe faster, and his heart rate accelerates. But that's not deception.

A No, that's not, although I -- I must correct. The heart usually decelerates in those situations initially and the breathing gets suppressed. And then it -- depending on what excites him later it might change. But these are complicated things. But your point, if I understand it, is that there are many things that cause similar actions that we see that we identify as being related to deception that are not caused by deception. Many things cause the same reactions, yes.

Q And you agree on that; I think you -- in fact, you stated in your affidavit, there is no known psychophysiological or physiological reaction that establishes a person is lying.

A Nothing unique to lying.

Q In other words, to paraphrase or to lift some of the phrasing that's in your documentation, there is no Pinocchio effect, that being, a person's nose won't grow if they tell a lie?

A Right. It only grows as you get older.

Q So the theory underlying polygraph is a hypothesis which is attempted to be reduced to a measure -- measurable reaction, and inferences have been drawn from the measurements taking -- on whether or not a person is telling the truth or is being

deceptive?

A Yes. With the additional requirement that it's within a structured protocol that allows you to make comparisons that then permit the inference.

Q I guess directing it back to the pertinent portion of the history of polygraphy. The early lie detector test which was the subject of *Frye* -- believe -- or I don't know if he was a doctor or not, a Professor Marston -- was a rudimentary blood pressure analysis. It analyzed increases in blood pressure or decreases; correct?

A Right, and it did so intermittently. It wasn't a continuous recording. They took occasional measures.

Q So that technique -- when a person says blood -- polygraphy, the lie detector test, that application of the theory has been rejected, the simplified Marston test?

A Yeah, the ability to make accurate inferences, right. And that was not a polygraph, was a single intermittent measure. The polygraph means several measures.

Q That's correct.

A Yeah.

Q But a lie detector test, nonetheless?

A Yeah, that's what they called them, yeah.

Q And then from that point on, others interested in trying to develop a test on whether or not a person is telling the truth

or not involved -- evolved into, if I'm correct, the relevant-irrelevant?

A Yes.

Q And that technique was subjected to criticism by those who were familiar with the technique and supported by those who wanted to -- that were proponents of it; correct?

A I would think that's reasonable, yeah.

Q And then it eventually was ultimately rejected except for in those instances where you say the FBI you believe still uses an R -- for abbreviation's sake, the RI test.

A Yeah. And I think the National Security Agency may still use it in certain circumstances for special purposes.

Q But in a general sense, that technique is not acceptable?

A Certainly is not scientifically supportable. And as far as I know -- I don't know of a case where such a test has been offered and subjected to this kind of a hearing. That's just not generally -- if somebody were to ask me or other people I know -- and that does happen occasionally -- to help them get a polygraph introduced -- a lawyer, for example -- and say, "Would you help us," and send me the charts and I look at them, and I -- if I see it's that kind of a test, I tell them the ballgame's over, yeah.

Q So that's one of the polygraph techniques that has been -- that was developed, it was widely used, and then ultimately

rejected?

A Yes.

Q And you say only a few agencies to your knowledge use that?

A I hope it's only a few, yes.

Q That evolved into what we may call just generically the (indiscernible) -- the control question test?

A Yes. I prefer to call it the comparison question test, but --

Q Well, the C --

A -- that's the -- that's a term that's used. It's just -- control, it's a little bit of a misnomer.

Q All right, so we'll use your phrasing. The comparison control test is the testing theory that evolved or may have developed on its own, but superseded the application of the RI test?

A Yes, generally.

Q And the control -- or the comparison control test was developed in the 1940s?

A Well, it started in the '30s with Father Summers at Fordham University. The first published thing calling it I think a control question was John Reed in 1947.

Q And that used -- the theory underlying the comparison control test, as the name implies, is that you compare one answer to another answer, with the expectation that the control

and comparison question, you have an idea of whether that's true or not to the relevant question?

A Well, yeah, not the answer, but the reactions --

Q Reaction.

A -- to the question, yes.

Q Now, the comparison control test now, some 42 -- no, 52 years later, is used to describe a whole spectrum of comparison control tests; correct?

A Well, two fundamental types, I think. The one that John Reed developed, which we could call the probable lie comparison question test, and the one that's now known as the directed lie comparison test. Those are the two major forms. Within either of those you can have slightly different question formats. But the basic type of questions and principles are the same.

Q The guilty knowledge test is not a comparison control?

A No, not in that sense. It's for a slightly different purpose. It's to identify whether a person recognizes information. That's why we call it the concealed knowledge test.

Q So that's a different application under the rubric or the big heading, "polygraph"?

A Yes. And it typically historically has used only one measurement: the skin conductance or skin resistance response.

Q The probable lie test on the control -- or the comparison

question test --

A Uh-huh (affirmative).

Q -- has had a lot of an -- review; is that correct?

A Yeah.

Q And when did the -- the probable lie began shortly after John Reed proposed it?

A Well, it began to be used. But the first scientific study evaluating its accuracy, which I think you were talking about, a lot of analysis, was the laboratory study that I directed with Dr. Barland, who was then my master's student. And we did that in 1971-'72. That was the first scientific study of it that I know of.

Q So polygraphy -- the probable lie test which was begun in the late '40s went without any scientific analysis for about 30 years -- or, well, maybe 25 years?

A Yeah, without any carefully controlled scientific studies. There were some studies, but, you know, they were not of the rigor and design that you would like.

Q After the probable lie test was developed and used, I believe in the latter part of 1970, maybe '75, '72 -- or correct me if I'm butchering this name -- Fruse?

A Fuse, F-u-s-e?

Q I thought it was F-r-u-s-e, but --

A The -- the -- you're talking about the directed lie now?

Q Yes.

A That's Louis Fuse, F-u-s-e, and that was 1982, I think,
he --

Q 1982.

A -- put out that description. I think that's the year.
They may have been using it for a while, but the writeup was
actually I think 1982.

Q So for -- and that -- the proposal for the direct -- or the
idea that there may be an alternative to the probable lie may
have arisen in the '70s, but you're saying that the actual
report was 10 years after your analysis of the probable lie?

A That's about right, yeah.

Q Okay. In 1988, you published the field study that you've
been referring to on the directed lie?

A Correct. F2, I believe.

Q Yeah. I have to make sure I got that sheet. No, I didn't.
Well, do you have a copy in front of you? Yeah, you do.

A Did you want me to refer to it?

Q Yeah, if you could look at page 60 and 61.

MR. McCOY: This is indeed F2?

MR. COLLINS: F2.

MR. McCOY: All right.

BY MR. COLLINS:

A Yes.

Q Okay. Therein you discuss a validity -- I believe the title is Validity of the Directed Lie Control Question; right?

A Yes.

Q And your attempt was to assess whether or not there could be an improvement on the probable lie?

A Yes.

Q And now back up a little bit. The probable lie comparison question test is based on the belief that if you ask a person -- if the examiner spends time with the individual and develops a question, a control question, comparison question, that is intended to elicit a response for -- against which they will compare the relevant questions.

A Right.

Q And for instance, a comparison question under that format in a rape case would be, "Have you at any time used force to get a woman to have sex with you"; is that a --

A I wouldn't -- you're talking about that as a probable lie question?

Q Yes.

A That's probably -- I wouldn't formulate it quite that way.

Q Okay.

A I'll give you a version that I would use. Prior -- suppose the case occurred this year. "Prior to 1998, did you ever take advantage of someone sexually?" That's how I'd word it.

Q Okay. That's fair.

A Tough for one to answer.

Q So that could encompass a man that believed a woman had said "yes" when she in fact said "no," or he got her drunk, or some other moral --

A Or just --

Q -- or objectionable --

A Or not even objectionable. Just sort of persuaded her and then felt later, "Well, gee, maybe I was too persuasive."

Q So it can encompass a variety of situations --

A Yeah.

Q -- which would cause a response?

A Right.

Q Whereas in a direct -- or in a relevant question of such a situation -- and correct me if I'm wrong -- would be, "Did you rape Betty Lou?"

A No, I would never say, "Did you rape Betty Lou?"

Q And why wouldn't you say --

A Because that incorporates a legal conclusion. Rape is a legal concept, and we try to avoid legal concepts. So what you would say it -- and it would depend upon the case facts. And rape cases are -- particularly important to get the case facts down real clearly. If she said, "He held my hands, you know, pressed my hands behind my head down on the bed and got on top

of me and forcibly had sex with me, and said if I screamed he would kill me," then the relevant questions would be things like, "Did you use physical force or threat to get Betty Lou to have sex with you?" Never rape.

Q So you never use a legal conclusion in a relevant question?

A Not unless it's part of the vernacular. But "rape," as -- as you know, having probably prosecuted cases like that, gets difficult to sometimes define these things.

Q In your study at page 60, while you conclude -- and by the way, this is a field study?

A Yes.

Q And it was constructed by, I believe 25?

A Twenty-five cases.

Q Twenty-five cases, eleven of which involved sexual abuse suspects?

A I believe so. I'm -- I'm still missing in my copy that page, so I --

MR. McCOY: If I could approach the witness and solve that problem.

THE WITNESS: Yeah --

MR. McCOY: Excuse me.

THE WITNESS: Thanks, Kevin.

BY MR. COLLINS:

A Yes, 11 involved child sex abuse cases.

Q Do you still abide by this field study?

A Hmm? Yes.

Q Do you rely upon it?

A Yes.

Q In fact, it's been repeated numerous times in the documents that you've submitted in your notebook?

A It appears in several places I think in different publications.

Q Is it correct that your report states at the bottom of page 60, going back to the -- over to the top of page 61, this study provides evidence to support the addition of a DLQ -- DLCQ, a direct lie control question or comparison question -- to field detection of deception examinations.

A Yes.

Q But the -- however, some caution is required, because many questions remain to be answered. This study examined the use of one directed lie control or comparison question in a mixed format with two standard controls; which means that only one of the comparison questions was a directed lie and the others were the standard comparison or control question?

A Correct.

Q And the directed lie control comparison question was found to increase the predictive power of the control question test in that setting?

A Yes.

Q "However, the question of the optimal application of the DLCQ has not been explored. It is not known whether an examination with only DLCQs would be valid." That's what you stated in your field study; correct?

A Correct.

Q "Such a study is currently underway in our Laboratory to explore further potential applications of the DLCQ. Until those data are available, the DLCQ should be used with caution in applications beyond those described in this study."

Correct?

A Correct.

Q And the applications that were referred to primarily were in national security settings, in preemployment and other screenings, and where subjects declined to answer standard CQs; correct?

A Yes, as well as criminal investigation. Because that's what these tests were.

Q It doesn't say that, does it?

A I'm not sure what you're saying. Were you talking about the last paragraph on page 60?

Q And 61.

A Yeah. Well, up to that point -- well, you start -- see the first line under Discussion on page 60. "...results of this

field study with criminal suspects indicate that the DLCQ is a valid and valuable tool in the physiological detection of deception." So that's the primary focus of this study. But then it goes on to say it might be useful in these other applications.

Q You use criminal suspects in field studies because you attempt to get a basis for determining the truth, or a ground truth; correct?

A Well, no. We use criminal suspects -- we always have to have some basis for determining ground truth, whether it's criminal suspects or laboratory studies. But we use criminal suspects to test things out in actual criminal investigation.

Q So in 1988, the directed lie control or comparison question test that was analyzed was the test in which one directed lie was used and two comparison -- traditional comparison questions?

A Yeah, probable lies.

Q With the caveat that you don't know whether or not it's going to work with a examination that had all directed lies?

A Yes. We had not done that yet. Although Fuse, you know, had reported success with that in military intelligence, but we don't have the data, except that Dr. Barland actually had done a study looking at that in 1981, and found that directed lies worked quite well.

Q In the -- part of the modern scientific evidence documents that you submitted -- and let me see if I can find the -- my notation at hand. Yes. It's Exhibit O.

A Yeah.

Q And at page 573 -- no, no, actually, let me back up here.

A I'm sorry?

Q At page 576 under Section 14-2.2.1, under the heading Directed Lie Test --

A Yes.

Q -- the book in which you participated, doesn't it state to date there's only one published field study of the DLT, the directed lie test, in this study; one directed lie control question was included with two traditional probable lie controls?

A That's correct.

Q Since 1988 then, we had Steven Horowitz's report in which you were a participant in formulating that for publication and peer review; correct?

A Yes, actually, I -- I -- it was -- the design was my design and I supervised it. He -- he did that as his doctoral dissertation under my supervision.

Q So you had some -- a great of say in the formulation of this document, provided him advice on how to present it, as any doctorate student would?

A Yes. I would hope so.

MR. McCOY: For my benefit, could counsel identify the exhibit he's referring to?

THE COURT: O?

MR. COLLINS: Your Exhibit F --

THE WITNESS: It'll be F --

MR. COLLINS: -- F1.

MR. McCOY: Thank you.

BY MR. COLLINS:

Q And as well as in Exhibit Zero [sic], it refers to that there is only one laboratory study done on the directed lie comparison control -- or comparison or control question test?

A I'm sorry, you've got me confused. Where does it say that that you were referring to?

Q Well, I may have -- be confusing. Your -- F1, Defendant's Exhibit F1 --

A Yes.

Q -- titled The Role of Comparison Questions --

A Right.

Q -- in Physiological Detection of Deception --

A Right.

Q -- published in 1997. That is the only laboratory study done on the directed lie comparison control question test; correct?

A No. There are -- there are laboratory studies done -- several laboratory studies done by the federal government. Dr. Barland's 1981 study was a mock-espionage study. The -- the study published in the Journal of Polygraph last year that was done at the DOD is a espionage scenario, directed lie test. And they had done other tests before that too. One of their CSP studies was a directed lie. And so that's three more. And there are others, as I understand it, at the DOD Polygraph Institute that have not been published yet. They are pretty slow at publishing things.

Q So the amount of -- scientific evidence book's already out of date? Published in 1997?

A Always out of date by the time it's published.

Q Because in --

A Takes a long time.

Q In there it states to date, only laboratory study of the DLT has been published?

A Well, no, that -- well, first of all, that's an oversight with regard to Barland's 1981 study. Frankly, I just completely spaced that one out; so does -- did Honts. Because that was 1981. Although -- well, I take that back. Maybe that wasn't published. We had the report, but it's a government report. So in that sense it wasn't published in the general literature, so no, that is not an oversight, it's correct, but

it -- there is a publication but not of that sort. And then that was written before the DOD published in 1998 their most recent study on the espionage version of the directed lie.

Q And that would be your -- let me find it here -- Defense Exhibit --

A One of the F exhibits, isn't it? Probably the next-to-last one there, or -- no, the third-to-last one. It's the -- yeah.

Q F4.

A Right.

Q And F4 pertains to the TES, the test for espionage and sabotage; correct?

A Yes, which is an all directed lie test.

Q So there's no field study on the all directed lie control test?

A No formal published field study. A lot of data, but no study based upon a complete analysis and compilation of those data.

Q Nothing that's been subjected to peer review?

A Not that I'm aware of.

Q The 1997 lab result -- the lab analysis of the directed lie test review -- refer to a analysis of the directed lie versus probable lie; correct?

A That is done in that study? Is that what you mean by --

Q Yes, was --

A -- refers to it? Yes, that's part of it.

Q And I believe on page 109 of that -- which would be the second page -- in 1997, the statement was -- and it's the beginning of the first full paragraph -- "There is virtually no research on the effectiveness of different types of comparison questions," is that correct?

A Yes, there -- there are no head-to-head ones except the 1988 study that we just discussed.

Q In that exhibit in that report, the laboratory study, it discusses the various stimuli or stimulus response that are recorded; correct?

A The various --

Q Like the --

A -- physiological response.

Q Physiological response.

A Yeah.

Q Yes.

A Uh-huh (affirmative).

Q Page 114, second full paragraph, doesn't it read, "The respiration results from DL test structures are anomalous."

A I'm sorry, which paragraph?

Q It'd be the second column.

A Second column, second paragraph.

Q Second full paragraph.

A Uh-huh (affirmative).

Q Doesn't it say that the respiration results from DL test structures, which is the directed lie, are anomalous.

Respiration responses by innocent participants to DL questions, both PDL and TDL, which in this is the personal directed lie and TDL being the trivial --

A Uh-huh (affirmative).

Q -- directed lie -- were opposite to that predicted by prior research, whereas respiration responses by probable lie participants were as strongly in the predicted direction; correct?

A Uh-huh (affirmative). Yeah.

Q It also goes on to say, "However, respiration may be the least reliable physiological measure when scored numerically."

A Yes.

Q "And respiration length had the largest drop in validity when the computer scoring model was cross-validated," and it refers to another article that you wrote in 1998 with Dr.

Kircher; correct?

A Yes.

Q And -- but the last question is -- when DL questions are used, directed lie questions --

A Yes.

Q -- perhaps respiration responses should not be used or

should be weighted the least of the physiological measures. And it offers up that this suggestion should be evaluated with another data set; correct?

A Yes.

Q Near the end of that column it contains the conclusion or the recommendation of the report writers, including yourself. And this would be at the second-to-the-bottom full paragraph.

A On which page?

Q Same page, 114.

A 114, second-to-bottom on the right-hand column?

Q Yes.

A Uh-huh (affirmative).

Q The sentence is, "Because DL worked as well or better than PL comparison questions, determination of which of these test structures is best for field use may be based on improved face validity, ease of administration, standardization of procedures, and privacy issues," right?

A Yes.

Q Privacy issues are not scientific concerns; those are ethical or legal concerns, correct?

A Yeah, but scientists should be ethical and aware of legal concerns.

Q Well, that's -- the profession -- the members of the -- science itself doesn't give a hoot whether a person is ethical

or not if the data is correct?

A Boy, I would hope that's not true. I think ethics in science are a very serious question. And --

Q Maybe I'll just rephrase --

A -- lots of scientists --

Q -- that. Science --

A -- yeah. They give more than a hoot.

Q -- when you add 2 plus 2, mathematically it's going to end up to be 4?

A Yeah, but that's an ethically neutral thing.

Q That's right.

A That's not like a polygraph test.

Q That's what -- the science itself is not concerned -- is affected by ethics. It's the interpretations of the data; correct?

A No, I must dis- -- respectfully disagree with you. If science abandons ethics, then science is in serious trouble, and I think --

Q -- I'm not talking about the practitioners, I'm talking about the actual science.

A Oh, I know. But I think I must respectfully disagree with you that science --

Q Okay.

A -- is not value neutral.

Q Standardization of procedures is something that the practitioners would develop?

A Well, you know, yes and no. I mean, scientists often develop things for practitioners to use. So I would hope that science and practice interact in that sense.

Q Ease of administration is something concerned with the examiner as opposed to the science underlying?

A Again -- and I -- I'm -- I don't want to be argumentative, but science when it deals with techniques that have potential important application must be mindful of those applications, how they will be structured, how they will be used. And those involve not only practicalities, but also ethics and moral values. That's why you have nuclear scientists who are abhorred by the work they did to help develop the bomb and spent the rest of their lives fighting the use of nuclear devices and were disgusted with themselves for having done that. So it's --

Q That pertains to the use of the science, not the science itself. Because the science is valid --

A You cannot divorce the same -- see -- the two. That's the problem. The problem was that until things like nuclear energy and certain other things began to produce great problems for the -- the world, scientists pretended to operate in a vacuum where they could do as they pleased; as long as the science was

pure they didn't -- you know, the consequences be damned. That's no longer the way science is. And scientists who act that way are not held in high regard.

Q Well, let's bring it back down to a more --

A And let me just amplify --

Q -- pedestrian --

A -- to take it -- make it very salient. The use of kinetic information and molecular biology and all of the things associated with that are not intimately intertwined with the applications. And scientists who work in those areas are painfully aware of the applications -- the implications for society. And there are debates that go on about whether certain science should even be done because of those things.

Q A person who suffers from diabetes has to take a blood test. And previously it used to be a person would have to actually withdraw blood by a syringe and apply it, submit it, and then have it tested.

A Yes.

Q Nowadays the same science has been reduced to a pinprick on a finger and apply to a one-touch or a blood analyzer; anybody -- even children, unfortunately --

A Yes.

Q -- use. So that's ease of administration, but the science is still valid, it has no regard to the administration because

the science itself is valid?

A But the scientist developed those techniques also. So they would say, good science allows us to develop better techniques. They're intertwined and it's important to disentangle them.

Q At the bottom of the paragraph, bottom of the page on 114, after it's recommended that directed lie comparison questions be used it states, doesn't it, "This recommendation is tempered by the caveat that the study reported here is a laboratory analog of a field situation that is difficult to model." And continued field evaluation of directed lie technologies is needed?

A It's like boilerplate. You always put that in.

Q And since 1988 there haven't been any other field studies on the --

A Well, there have been on published formal field studies, but continued field evaluation certainly has gone on. Dr. Honts and I both for years collected data on our own examinations. And for a period of years, because of the concerns about -- before we had these data that you were just talking about, the Horowitz, et al. study, we were reluctant to use a complete directed lie test without any probable lies. And for several years, he and I used what has often been referred to as a hybrid test, which had two probable lies, two directed lies. And I did that for several years, and monitored

the results and looked at -- when I got outcomes that confirmed the extent to which they were accurate. And what I found -- and I did a lot of analyses -- was that when you use probable lies and directed lies, if a person is deceptive, it matters not. They fail on both. But if a person is verified as being -- having told the truth, what often happens is that the directed lie carries the burden of that, that the probable lie just doesn't function in that setting, because the person's attention is focused on the directed lie, and the probable lie does not produce the same kind of reactions it would if it were alone.

And after having conducted probably a couple hundred tests along those lines, I concluded that based on those data -- and this is continual field evaluation -- that it made no sense to include the probable lies. If you're going to have any directed lies, you should have all directed lies. And that was supported by the Horowitz study. If you're going to use probable lies, then just use probable lies. To mix them did not make sense.

Q You're saying that for a while you used what's -- what you considered the hybrid test where probable lies and directed lies were used; correct?

A Right. It's the one that's referred to by the Court of Appeals in *Gilliard* (ph), by that name.

Q And so now you've developed the Raskin test, where you use all directed lie control questions, use those comparing the relevant questions?

A Well, I appreciate the flattery, but my ego's not big enough to call it the Raskin test. It's a -- it's a directed lie test.

Q It's a directed lie test that uses all directed lies --

A Right.

Q -- for the comparison?

A Yeah. Three directed lies, usually four relevants.

Q And the test that you administered in this case is the Raskin test?

A I don't want to be argumentative, but I don't want to call it the Raskin test. I just don't feel that's appropriate. It's a test that was developed through our research at University of Utah. If you want to call it the Utah directed lie test, the Olympics notwithstanding, I -- I wouldn't mind. But please don't use my -- I -- I don't have the same kind of ego that these polygraph examiners have when they call it the Backster test and the Reed test. It's not my test. It's something that's evolved in a lot of scientific research with many colleagues, and I just don't think that's appropriate.

Q Okay. The test that you administered in this case involved a stim test, stimulation test; that's what we --

A A number test, yes.

Q A number test.

A Uh-huh (affirmative). Yeah.

Q You use that to acclimate the individual to what's coming up. And --

A It --

Q -- you tell them that, "I want you to pick a number, lie, and whoa, boy, you lied, and I can tell."

A Well, I don't quite say it, "Whoa, boy." You don't need to get dramatic with them. They understand. But we use this to get them used to the procedure, to -- accustomed to the equipment, accustomed to being asked questions, to what it feels like when you go through that procedure, having that inflated cuff on you and being questioned, and also to demonstrate to them that when they lie, there is a particular pattern that shows up that's different from when they don't lie.

Q Then you proceed with an actual chart. To use that shorthand, the chart being the test?

A Right.

Q One phase of --

A Right.

Q -- the (indiscernible) --

A This is chart zero and then the others are one, two, three.

Q Right. And then in the way you apply that directed lie control test, you -- as you said, you -- before you administered the examination, you went over with Mrs. Walker generally her understanding of the charges, your understanding of the charges. From that then you develop a idea of what relevant questions to ask?

A And I actually had them all written out in advance. I don't know that I altered the wording on any of them.

Q Okay. And then you acclimated her to what the procedure would be. You're going to ask questions, response, so on?

A Yes, I'd --

Q And you --

A -- already told her about that.

Q And you told her that when it comes to -- you went over what -- the directed lie control questions, and you told her, "Answer 'no.'" And --

A That's right. I didn't call them directed lie control questions. I just said --

Q Does --

A -- "I have these questions that I need to have you lie to, just like on the number test," you know.

Q And one of them was, "Have you ever told a lie," or actually --

A Well, "During the first 30 years of your life, did you ever

tell even one lie," I think is one of them. It's what I typically use -- whoop. There you go. That's gotten a little torn there.

Q The directed lie number 1 is "During the first 30 years of your life, did you ever tell even one lie?"

A Yes.

Q Directed lie number 2 was, "During the first 30 years of your life, did you ever even make one mistake" --

A "Even one mistake."

Q Or "make even one mistake."

A Yes.

Q "Ever did you make." And number 3 being "During the first 30 years of your life, did you ever do something that you knew was wrong?"

A Yes.

Q And those are pretty standard questions?

A Yeah. I mean, you could use them with virtually any test. I have about six that I choose from, depending upon the situation, what I think fits better. But those will be three that I use very commonly.

Q And once you went over with her those questions, to which you told her, "Answer 'no.'" I want you to think about something, answer 'no.'"

A "I want you to think of a time you did this; don't tell me

what it is; and when you answer the question, answer 'no,' and then you'll know it's a lie."

Q Okay.

A "Just like the number 5. You pick that; you know it's a lie when you say 'no.'"

Q And you don't invite her to tell you what she's thinking. In fact, you tell her, "Don't tell me."

A I don't want to know.

Q You don't want to know. So it could be --

A Could be that she lied to her mother about where she was some night when she came home a little late. I mean, I --

Q That's --

A -- don't know, that's personal stuff, and --

Q Right. Or lying on her taxes or lying to her spouse, or anything to which --

A Could be. I -- I don't want to become embroiled in those things, and I don't want her to be embarrassed by having to tell me.

Q And it goes -- it even goes with the other three -- you have absolutely no idea how grave or how minor the lie or the mistake or whatever it was?

A No. Same is true with the problem lie. You don't know.

Q Then you administer the test. And in this case, after you administered the test, chart 1, after that was done, you

engaged her in conversation?

A Briefly.

Q And you asked her some questions about, "How'd it go? Do you have any concerns?"

A "How did you feel during the test? Any problems with any of the questions?" That kind of thing.

Q And then -- and you initiated the conversation, she didn't?

A Yeah, I usually do with all subjects. You -- they're sitting there waiting for you to do something. They don't usually volunteer much at that point.

Q Then you administer the chart -- the test again, chart 2?

A Yes.

Q Following which you had some conversation?

A The same type, yes.

Q She expressed some concerns?

A I think she did after chart 1 and chart 2. As I recall she said, well, you know -- I think after chart 1 she said something like, "Boy, I'm just nervous. Every time you ask those questions, I feel like my heart's in my throat," or something like that. She expressed that she was just nervous throughout. And -- and I had to assure her, "Look, that general nervousness will tend to diminish as we go through. Just concentrate on whether or not you're being truthful in each of the questions, and if you're being truthful, you'll be

able to relax more, and if you're not being truthful, then you're going to have a problem." And I said, "So just concentrate on the truthfulness of your answers rather than on these more general things." And we had, as I recall after chart 2, a little bit of the same kind of conversation that she initiated, but it was somewhat lessened, as I recall. I --

Q Then you administered chart 3, which for some reason you didn't score?

A I didn't score chart 3 because I had a problem with the computer. It did something very, very strange. And if you listen to the tape you'll hear me telling her at some point that that happened. You can hear me reboot the computer, because it did something that it's never done before. But using Windows, you just sort of have to be prepared for strange occurrences, and that's what happened.

What happened is -- if you want to know, I -- it was -- when I'm doing these charts, the -- the recordings are displayed in real time on the screen of the computer and they scroll from right to left. And they scroll at a fixed speed. And what had started happening during that chart is, it was scrolling at an uneven speed, sometimes very slowly. It would almost stop and then it would pick up again. And it was very weird. And at the end of the chart, when I went to display it, one of the questions -- the last question was completely

missing, the last neutral question. So given that and the strange way that it looked, I felt that it was too risky to even use that chart, and so I ran additional charts to replace that. And I told her that's what I was going to do.

Q And then you administered 4 and 5, and each time between you had conversation?

A Well, I had some conversation after 4. Of course, after 5, then the test was finished.

Q Between chart number 1 and chart number 5, there came a time when she expressed some concern about having borrowed money from the Post Office once before. And you discussed with her that, "Don't worry about that; employees do that all the time."

A Well, actually, I had brought that up. I had initiated that conversation during the pretest interview, because that is a typical problem that arises in an employment setting where there has been internal loss. It is very common for employees to, when they find themselves without a -- cash available and need to buy lunch or get a soft drink or something like that, people do it all over, this is well known. And they will borrow a dollar or five dollars or ten dollars or something like that --

Q Or twenty dollars, like she said?

A -- or twenty dollars, and -- and then pay it back.

Sometimes they actually even forget to pay it back. Sometimes they write a little IOU and put it back. Depends on company policy too. But it's important when you have something like that to distinguish between that type of a thing and what the person is actually accused of, which is the theft of \$3,000. And so I initiated that to make sure it was clear to her. And you'll see, if you listen to the tape, in the pretest interview, early on I bring that up and I said, "We're not talking about that kind of thing. We're talking about \$3,000. We're talking about serious theft and so on. And I don't want you to be confused with some minor thing where you may have temporarily borrowed a few dollars. We're talking about large amounts of money."

And then she brought it up at one point after one of the charts. And I said, "Well, like we talked about before, I don't want you to be concerned about something minor like that. We're talking about this money that you're accused of taking." Otherwise it becomes a control question.

Q The test that was the subject of the article that -- Defendant's Exhibit F4, the TESS -- the test for espionage and sabotage?

A F4, yes.

Q Yeah. And the directed lie test that the -- that they administer, this is the report that -- to which you were

referring as being a subsequent laboratory study?

A Yeah.

Q At (c) doesn't it state, "between test stimulation is eliminated"?

A Yeah, the -- that's the Department of Defense position, is -- when you say at (c), where is --

Q That first column, page 69.

A 69 -- between test stimulation is eliminated.

Q It does say that; correct?

A Yes, because what they do is they run this test as a straight, continuous sequence.

Q And this test, the test for espionage and sabotage, is not used for courtroom purposes, it's used to detect espionage or sabotage?

A Yeah. It could be used for criminal investigation. I don't see why not.

Q But it's not?

A Hasn't been yet. But maybe they're doing that. I don't know.

Q So in some regards, the test that you administered in -- for Mrs. Walker is different from that test which was referred to in test for espionage, because they eliminate between-test stimulation, whereas in your test you had discussion and you actually informed her, "Don't worry about this borrowing"?

A Yeah, don't be confused about it. I didn't -- no, I said don't worry -- I said, "Don't be confused about it. That's not what this question addresses."

Q And --

A She can worry about it all she wants. I don't want her to be confused about that with this question.

Q And part of your statement to her is, "People do it all the time."

A They do.

Q But doesn't make it right though, does it?

A I never said it was right. I just said, "I don't want you to be confused by it." If she was accused of borrowing \$20, I don't -- and that's all, I don't think we'd be here today.

Q So in sum, as we stand today, there is a -- one field study which was a limited direct lie control laboratory field study in 1997, and this one in 1998 where the TES test was considered to be a directed lie question?

A In Barland's 1981 study, which has not been --

Q Which is not published.

A -- published in the open literature, although it's published within the government circles, and I have a copy of it.

Q At Exhibit H, the Canadian Police College Polygraph Technique report, which was admitted --

A Yes.

Q -- page 14 --

A Page 14.

Q -- the first column --

A Wait, wait, let me get it. Yes.

Q Second paragraph. Doesn't that state CPC Polygraph Training Unit might consider the directed lie control as a supplement to their already strong program?

A Yes. It's been taught at their school, and I believe some of their examiners are now using it. This was done a few years ago. This was 1994, was it; '94. And I think in that time, some of their examiners have now started -- the RCMP examiners have started using it. They've been teaching it in the school.

Q At Exhibit K, which is a Psychophysiological Detection of Deception article written by your colleague, it simply repeats in the text the text of the 1998 field test, doesn't it?

A Probably. Let's see. It has -- it has the laboratory study and it has -- let's see. I'm looking for the -- the field study. And -- and the field study is described in there. So both are talked about with -- and it's not just a repetition. There's other stuff discussed in here.

Q There's a North Dakota Law Review article at --

A Which exhibit, I'm sorry?

Q L.

A L.

Q I believe you testified that Bruce Quick was a professor of law?

A That's my recollection, yes.

Q All right. It could be --

A At North Dakota.

Q -- that he's simply an attorney-at-law when he wrote this article?

A Oh, was -- oh, I'm sorry. You know what, I was thinking of -- it may be true. Let's --

Q And that he's a --

A I take that back. Honts had a colleague there who was a law professor, they were doing some work together. But it wasn't this one. I think you're -- I stand corrected. I believe he was not a professor. He may have done some teaching there, I don't know.

Q And in fact, this North Dakota Law Review is written towards polygraph in North Dakota, because it cites a majority of North Dakota cases; correct?

A Well, it's certainly going to highlight North Dakota cases because it's in North Dakota. But it's not limited to that at all. And the scientific material here is not peculiar to North Dakota.

Q The -- one of the things in here is that -- the

conclusion that statements made during the course of a polygraph, the defendant still retains a Fifth Amendment right so that they wouldn't be used against him?

A I'm sorry, where's this?

MR. McCOY: Could I have a reference, please?

MR. COLLINS: It is -- I have a number of things highlighted here. There is a conclusion that the individual who takes the test in North Dakota, page 1009, talking about how under a North Dakota Supreme Court decision, that person would still have a Fifth Amendment right; correct --

MR. McCOY: It's beyond this witness' competence as to whether somebody has a Fifth Amendment right or not.

MR. COLLINS: I'm asking if it's --

THE COURT: Well, the witness could answer. If it is, he'll say so.

BY MR. COLLINS:

A What was the question? I'm sorry.

Q The question is, in the article that you testified to, which was admitted by the defense -- say -- it said in the North -- at least as far as it relates to North Dakota, they believe that the Fifth Amendment privilege against self-incrimination would have an application in a polygraph test; correct?

A Well, it says that to begin with, and then it goes on to

talk about where the Fifth Amendment right does not allow -- is not violated by producing evidence. And I'd have to read this, and then I won't know any more than I did just from reading it, so I'm not sure what light that would shed.

Q Oh, so you haven't read this?

A This Fifth Amendment section?

Q Or this North Dakota Law Review article?

A Oh, I read it a long time ago. But you're asking me a question that's beyond my competence. I'd have to read it to see what the -- I don't know what the North Dakota court did. So they're talking about actually it not being -- it says the court, again relying upon *Schmerber* held that --

Q Well, I don't want to ask you a question --

A Well --

Q -- if you don't have an opinion.

A I mean, I just have to read it. I don't know what the North Dakota court --

Q Well, I'll move on.

A -- said because it's -- first of all, I don't live in North Dakota, and secondly, I -- I'm not a scholar on Fifth Amendment law, so anything I'd have to say is not worth very much.

Q The -- in fact, in this text it simply repeats again the field study of 1988; is that correct?

A Well, I'm sure it does do that. It does more than do that,

though.

Q You just testi- -- stated under oath here that you have no idea about the Fifth Amendment's application.

A In North Dakota.

Q Well, it was regard to the -- or North Dakota; you have any idea about it -- application elsewhere?

MR. McCOY: Relevance, Judge. I'm going to object.

THE COURT: There's been an objection to relevance.

MR. COLLINS: It goes to what -- the next topic of -- one of the criteria not covered by Mr. McCoy about the friendly polygraph theory.

MR. McCOY: That doesn't -- then it's beyond the scope, because we didn't discuss the friendly polygraph theory.

MR. COLLINS: Well, it's cross-examination, Your Honor.

MR. McCOY: It's beyond the scope.

THE COURT: It addresses the exhibit that's in evidence?

MR. COLLINS: No, it addresses some of his prior testimony, Your Honor, which he's testified to that he disagrees with.

THE COURT: I'll overrule the objection.

BY MR. McCOY:

Q You have previously testified that there is no basis for the theory that a friendly polygraph will somehow skew the results?

A By friendly, you use that in quotes, meaning an examination conducted under what is ostensibly an attorney-client privilege?

Q Correct. I mean, I'm using the phraseology that you've used in other courts.

A Right. I just want to make clear that the term "friendly" is something that somebody else has used. The term "privileged" would be more appropriate. That's why you put "friendly" in quotes to begin with.

Q Not because you're being friendly, but just because --

A Well, I'm a friendly person, but I'm not anymore friendly when I do that than I am if I were to do it for law enforcement agency. But if I do it for law enforcement agency, it's, quote, "not friendly."

Q Well, I guess we can define --

A It's the formalities.

Q Let's define -- I mean, it's -- other courts, federal courts have described it as a nonstipulated-to polygraph or a polygraph without notice to the government. You've used friendly polygraph. Essentially what we're referring to is a polygraph that's administered to a defendant in a criminal case --

A Yeah, or a suspect, uh-huh (affirmative).

Q That -- or a suspect -- that without notice to the

government, without giving the government an opportunity to be present, to formulate questions, or choose the examiner, submits to a polygraph examination. And then if the results are favorable, the favorable results are referred to the prosecution, saying, please dismiss the case because it passed the polygraph.

A It might say that.

Q And in such situations, a defendant represented by counsel, knowing that they have a Fifth Amendment or believing they have a Fifth Amendment privilege, after discussing with counsel, could draw the inference that, "If I flunk this, it's not going to be turned over to the prosecution, because it can't be used against me."

A Well, that's an interesting conjecture, and that's not a legal question now with regard to the Fifth Amendment, but a psychological question, which I can answer. When somebody takes a confidential test -- let's just refer to it as that -- it's not -- they know that the government hasn't been apprised. They know of no formal agreement to provide it to the government. The lawyer may or may not have told them that it's privileged. When they come to take the polygraph test, they may feel when they walk through that door that whatever goes on there stays just between the attorney, the subject, and the polygraph examiner. By the time I've spent 10 minutes with

them, they are disabused of that notion, because they are required to sign a form which is read to them, and then they sign, which says that "knowing that these results may be used as evidence against me in a court of law." So psychologically, I have taken control.

Sometimes they say, "Well, gee, I thought this was just between me and my attorney." And I said, "Well, that might be, but then again, it might not. Because although I may report the results only to you and to your attorney, what happens with it under the -- after that is not under my control, and there are circumstances where it might be disclosed to the government and it might be presented in court. It depends upon what you people do with it and who you tell about it."

Q "You people" being whom?

A The subject and the attorney. And anybody else that might tell. I mean, they might go running to tell somebody else, who then informs the prosecution and then, as you know, just because something is stated formally doesn't mean there can't be some efforts in open court and people find out about all kinds of things. Sometimes doors get opened. So as an -- as a psychologist or as a polygraph examiner, the only guarantee that I can give anybody is, "I'll report it to you and your attorney; but I need to have you sign this form acknowledging that it might be used as evidence against you in court."

Q In this particular case, Mrs. Walker was at her attorney's office, you were at her attorney's office, and she entered, you met, first time?

A Yes.

Q She knew that you -- who you were? You were the polygraph examiner?

A Well, she knew what her attorney told her. I don't know what he told her exactly.

Q And you're Dr. Raskin. You've got a --

A Yes.

Q -- number of letters behind your name?

A Well, probably just introduced that way.

Q And when you began to administer the test, you in essence Mirandized her?

A That's correct.

Q You advised her of her right to have counsel present?

A Yes.

Q Waive that?

A Yes.

Q You advised her of the right that she didn't have to take this test?

A Yes.

Q That -- you advised her that anything she said, regardless of whether it's true or not, anything she said could be used

against her?

A Yes.

Q You discussed with her consent?

A Yes.

Q And she agreed to take the test?

A Well, the -- I also told her that she didn't have to answer any questions and that she could terminate the test at any time.

Q Thank you. She agreed?

A Yes.

Q You believed her?

A I didn't believe her. She signed a -- a form saying she agreed to take the test.

Q And so you accepted that as a valid waiver of her *Miranda* rights and consent to proceed?

A I accepted it --

Q Or a waiver of the --

A I accepted it for what it was. I'm -- I mean, whether it's a valid waiver, you and Mr. McCoy and a lot of people could argue about it. It goes on in court every day. That's not my business. I did my job. And from there you guys take it.

Q She didn't have any questions, she wasn't -- had any concerns about it?

A She might have had concerns. People -- lots of people have

concerns they don't express. Sometimes they express them. So you would have to ask her --

Q That --

A -- what concerns she had. But I can assure you that people get concerned when they come to take those tests and don't feel very comfortable.

Q Well, I guess I may have missed -- may have improperly used that word; in the context, that was talking about concerns about what she was waiving.

A I don't know. I mean, I can't -- I'm not a police officer that's going to have to go to court and defend a statement that I obtained based upon what I may or may not have told somebody and whether I got the statement before I gave them -- you know, asked for the waiver of their rights or whether I got the statement after I gave them the waiver. I mean, that's not my concern. My concern is to do my job, and I do it the same way every time.

Q Okay. I believe it's part of this copy of the resume that Mr. McCoy gave me -- he's given me one other, I just want to make sure -- there -- in your resume you previously listed, among 36 pages here, the students that you've directed, reviewed, master's thesis and so on. And one of them is Gordon Barland; right?

A Yeah. Isn't that in the current one?

Q It may be. This one's --

A I hope it --

Q -- a much better-looking one than the one I received. It's clean.

A Oh, you got an old one before?

Q Yes.

A Oh, well, I -- yeah, I finally got -- got around to reformatting the whole thing and putting all the pieces together in more recent software. But there should be a page in there somewhere, I think, but --

Q Well, I guess the point being, Gordon Barland was a student of yours?

A Yeah. He -- he obtained his master's and Ph.D. degree under my direction.

Q And I believe that you testified that he in fact was kind of your trainer in the polygraph; isn't that correct?

A No, he wasn't my trainer. He was my internship supervisor, which meant that under the licensing statute in Utah, I had to have a licensed polygraph examiner listed as my internship supervisor during the one-year internship between being an intern examiner and a full examiner, and that he had to sign off that he had looked at X number of my tests and talked with me about it --

Q Okay.

A -- and that they were of adequate quality.

Q And in fact, you've cited a number of -- you've not cited, but you've submitted, like for instance, Plaintiff's Exhibit F3, that photocopy of the fax from Gordon Barland, Ph.D.; correct?

A Yes. Well, he didn't fax it to me.

Q Well, I mean, it's something that bears his name.

A But it's a -- it's a report authored by him.

Q And he's an expert in the field of polygraphy?

A Yes.

Q And he's a respected member of the field of polygraphy?

A Yes.

Q And he testified in *United States versus Orions*.

A *Orions*, yeah.

Q *Orions*?

A Uh-huh (affirmative).

Q *Orions*, 9 F.Supp.2d 1168, in which you were also a witness; correct?

A Correct.

Q And Dr. Barland testified under oath that a friendly polygraph test might -- and I believe the -- I don't want to be one -- correcting the judge, but I think "might affect" as opposed to "might affect the results." Is that correct? Dr. Barland testified that friendly polygraph -- a friendly

polygraph could affect the results?

A I'll take your word for it. I think he did. I don't have the transcript. That's problem a -- the judge's findings. But what he said exactly, I don't recall.

Q And in fact, part of the -- to jump back to a -- an earlier topic, part of the controversy in the -- at the hearing was the use of countermeasures?

A Well, the hypothesized use of countermeasures.

Q And Dr. Barland testified, based upon his own experience and his own research, that there are countermeasures that could be used to invalidate --

MR. McCOY: Objection --

MR. COLLINS: -- polygraph --

MR. McCOY: -- confrontation; hearsay, primarily confrontation.

THE COURT: Overruled.

BY MR. McCOY:

A Could you repeat the question? I'm sorry, I lost it.

Q It was in regard to countermeasures.

A Yeah, I understand that.

Q And Dr. Barland, who you've relied upon and the defense has relied upon, previously testified that there are -- there is a potential that countermeasures can invalidate a polygraph?

A And I wouldn't disagree with that. There certainly is that

potential.

Q And that there are potential problems presented by a friendly polygraph test?

A It's certainly a possibility, although the extensive data clearly argue against that.

Q And in fact, in your -- the *Orions* case, Dr. Barland testified that Mr. Orions' test showed potential countermeasures?

A I think he did. But he couldn't demonstrate that they really were. It was speculation on his part. He had no way of knowing. He says that a lot.

Q At that same trial, you testified that in fact, countermeasures were not a concern when evaluating a polygraph test; correct?

A I probably testified that I didn't believe that in those tests it was a concern. And they are generally not concerned when they're dealing with that context. The place where they would most likely be a concern is where you have sophisticated subjects with access to specialized training, namely in the intelligence community. That's where the greatest concern is.

Q And in fact, you -- in -- during your testimony in the *Orions* case, you completely discounted the possibility at all that an individual might be trained?

A Oh, I don't think so. I think you're reading the judge's

interpretation for his own purposes of this ruling and not my testimony. I think if you looked at my testimony, I don't think that's quite correct. It's overstating things a bit.

Q You're stating that the judge misinterpreted for his own purposes?

A Well, he's writing a ruling and he is writing a ruling based upon conclusions he has drawn. And his interpretation of my testimony is not necessarily my interpretation of my testimony.

MR. McCOY: Your Honor, I think the appropriate way to conduct this examination is to use the transcript as opposed to what someone else has rendered. And really, if he's being asked what he said in the past instead of, you know, what -- then it's kind of a bizarre kind of -- kind of a hearsay objection, when, well, somebody says you said this.

THE COURT: The witness has already pointed that out. We'll see where Mr. Collins is going --

MR. McCOY: In other words, the most effective way is to give him his testimony. He can explain it or accept it.

THE COURT: Mr. Collins, are you going to continue --

MR. COLLINS: Your Honor, it's 5 o'clock. I think that, if we want, we could break now and pick up tomorrow.

THE COURT: What time do counsel want to get started tomorrow?

MR. McCOY: I've set aside the whole day. If you wanted to start at 9 or whatever your pleasure, Your Honor.

MR. COLLINS: I think 9 or 9:30 would be the preferred time to begin, so at least we can organize the -- what we need.

THE COURT: We'll start at 9, because I probably will take at least an hour and a half for lunch myself, because I have an appointment during that time. So 9 a.m. in this courtroom right here.

Now let me ask, are there -- was there an audiotape?

MR. McCOY: Yes.

MR. COLLINS: That's been admitted, Your Honor. 4A, 4B.

THE COURT: All right. If that can be handed to the clerk. Unless there's some reason for counsel wanting it overnight, I might just (indiscernible) --

MR. COLLINS: No, I've made a copy. If by chance this copy is not as good -- it seems to be -- is there's a deterioration -- a technological deterioration of tape recordings. If this is not as good, then I'll substitute a better one --

MR. McCOY: I also have the --

MR. COLLINS: -- a copy --

MR. McCOY: -- I don't have the original with me in the courtroom, but would certainly make it available if the Court was -- if you have any difficulties with that, please let me

know, and I'll --

THE COURT: All right. So it -- it's a two-cassette --

MR. McCOY: Yes, there's --

MR. COLLINS: Yes.

MR. McCOY: -- two sides and then part of a third side.

THE COURT: Anything else before we take the overnight recess?

MR. COLLINS: The exhibits which have been admitted, does the Court wish for the parties to hold onto them until --

THE COURT: Yes.

MR. COLLINS: Okay.

THE COURT: Okay, I assume Dr. Raskin comes back tomorrow.

THE WITNESS: Thank you, Your Honor.

THE COURT: We'll be adjourned then until 9 a.m.

MR. McCOY: Thank you.

THE CLERK: This matter is in recess until tomorrow morning at 9 a.m. This court now stands adjourned, subject to call.

(Proceedings concluded at 5:05 p.m.)

CERTIFICATE

I certify that the foregoing is a correct transcript from the electronic sound recording of the proceedings in the above-entitled matter.

Teresa K. Combs, Transcriber

Date

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