UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY

UNITED STATES OF AMERICA, EX REL.
DR. HELENE Z. HILL,

Plaintiff,

vs.

UNIVERSITY OF MEDICINE & DENTISTRY OF
NEW JERSEY, DR. ROGER W. HOWELL and
DR. ANUPAM BISHAYEE,

Defendants.

DEPOSITION OF: DR. JOEL PITT
Wednesday, September 2, 2007

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T R A N S C R I P T of Deposition Proceedings held in the above-entitled matter, taken by and before Adrian J. Febre, a Shorthand Reporter and Notary Public of the State of New Jersey, held at the law offices of Bucceri and Pincus, Esqs., 1200 US Highway 46, Clifton, New Jersey 07013, on Wednesday, September 2, 2007, commencing at 10:00 a.m.

*** Transcript prepared in accordance to Rule NJ ADC 13:43-5.0 ***

A P P E A R A N C E S

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E X H I B I T S

PITT EXHIBITS

I N D E X

INFORMATION AND/OR DOCUMENTS REQUESTED

INFORMATION AND/OR DOCUMENTS	PAGE
NONE	

QUESTIONS MARKED FOR RULINGS

PAGELINE /	PAGE LINE
NONE	

D R. J O E L P I T T,
6 Elm Ridge Road, Princeton, New Jersey 08540,
having first been duly sworn, according to law,
testified as follows:

DIRECT EXAMINATION
BY MR. FLYNN:

Q. Good morning, Dr. Pitt. My name is Scott Flynn. I'm from the law firm of McElroy, Deutsch, Mulvaney and Carpenter. We represent the Defendants University of the Medicine and Dentistry of New Jersey, Dr. Roger W. Howell and Dr. Anupam Bishayee in this matter that is proceeding in the United States District Court, District of New Jersey, Civil Action number 03-4837.

The case has been brought by Plaintiff Dr. Hill, and we are here to take your deposition today. You have been named as an expert witness by the Plaintiff Dr. Helene Hill and have submitted an expert report in this the matter, correct?

A. Yes.

Q. I am going to show you Pitt's Exhibit 1, which is notice to take a deposition. Have you seen this before?

(Whereupon, the Witness looked at the aforementioned exhibit.)

A. Yes.

Q. You understand that pursuant to this notice that is why you are here?

A. Yes.

Q. Before we get started with your deposition, I would like to go over a few instructions that might make it easier today, make it flow better.

Have you ever had your deposition taken before?

A. No, I have not.

Q. Okay. Have you ever given a statement under oath prior to today?

A. Not that I recall. I can't swear to you that I haven't, but I don't recall.

Q. Well, in that regard, to my right and to your left is a Court Reporter. He is taking down every question I ask and every answer that you give. The record that we create today is going to be put in a booklet called a transcript, which you will have the ability to review after the fact if you or Mr. Pincus so chose to.

Do you understand that?

A. Yes.

Q. Do you understand that the transcript of today's testimony can be used at the time of trial?

A. I do

Q. Please note that to the Court Reporter taking down all of the our words, the uh-huhs or the nods of the head, while I understand what you are saying, it makes it difficult for him. So please give yes or no answers to my questions.

A. I thought I said I do. If I have to say it louder I will.

Q. No, it is just that you may anticipate what I am saying for some of my questions or you might say uh-huh or uh-uh and he can't take it down.

A. I understand.

Q. In that same line, I ask that as I am asking a question please don't interrupt me, as you may anticipate what I am asking. Just wait for me to completely finish my question before you answer, and then I will do the same for you, to wait until you completely finish your answer.

A. Understood.

Q. Please remember that you are under oath today so you are obligated to tell the truth.

Do you understand that oath?

A. I do

Q. This is important because your testimony today is the same as if you were testifying before a judge, and it is possible that your testimony here could be used at trial.

Do you understand that?

A. I do.

Q. I will be asking you a series of questions relating to your report and the subject matter of this litigation, but none of my questions from the outset are intended to be ambiguous or tricky. If some of them do seem that way to you, please let me know and I will rephrase them for you. If I stated something improperly from your report, please correct me and we can start the question over.

During the deposition I may ask a question that Mr. Pincus may object to. I ask that you wait until he puts his objection on the record and then he will instruct you on how to proceed and then we will move on from there.

A. Understood.

Q. Thank you. If at any point you need a break during the deposition, let me know and we will take a break. This is not a marathon. I am not here to speed through it.

A. Once more I understand.

Q. Do you have any questions for me before we begin?

A. No.

Q. Could you please state your name for the record?

A. It is Joel Henry Pitt. Ordinarily I use Joel Pitt.

Q. And your current address?

A. Depending on the end of the road you pick, it is 6 or 97 Elm Ridge Road. I don't want to be confusing about that but it is confusing. It is Princeton, New Jersey 08540.

Q. I will now show you what has been previously marked as Pitt 2 which is a copy of your CV that I received in this matter. Just take a quick look at that please.

(Whereupon, the Witness looked at the aforementioned exhibit.)

A. That is indeed my CV.

Q. Is that complete, is your CV complete at this time?

A. Pretty much.

Q. How frequently have you updated your CV?

A. Actually I have updated it -- I guess I

updated it whenever I sent this in. I haven't changed it. I am still a professor at Georgian Court. That is basically it.

Q. If we could just go through a little bit of your background I guess. Let's start with your education. If you could give me the benefit of describing where you got your **BA**?

A. I got my **BA** at Columbia College, Columbia University.

Q. And that is in mathematics?

A. My major was mathematics.

Q. And you received that in 1961?

A. Right.

Q. And your Master's Degree?

A. Is from the Graduate School of Science at Yeshiva University. I received the Master's Degree in 1963 in mathematics.

Q. And postgraduate?

A. I finished my PhD in 1972.

Q. Okay. And your thesis here it says it is a Random Walk on Countable --

A. Actually it is misprinted. It is Random Walks on Countable Abelian Groups.

Q. Could you give me a brief description of what that entailed?

A. It is rather abstract. A random walk is a mathematical process in which one picks random objects and successively adds them to each other.

The classic example, okay, is I decide to walk along a path flipping a coin to decide which direction I am going to take. Okay. But what mathematicians do is they construct abstractions of this. I don't want to turn this into a long lecture, but I will give you a little piece of it.

As mathematician also what you do is you start with a simple problem and then you ask suppose I change the circumstances a little bit. And what happens is in mathematics there are various systems in which you can perform what kind of is like addition. We call these systems algebraic structures. One of them is a structure called a group.

So what I was doing is I was looking at random walks where essentially you are picking a random element of a group, then you are picking another random element of the group and you are adding these together. You are picking another one and continually adding those together, and you are asking how do these sums behave.

You might say how is this a walk? Well,

imagine if I flipped a coin to decide whether to go left or right and I took a step left or right. Adding up ones or minus ones will tell you where I am. And I am looking at what is called a generalization of that. And in my thesis I looked at a variety of degrees of this of varying degrees of complexity.

Q. What is the purpose of your thesis to reach a conclusion?

A. The purpose of a thesis in pure mathematics is to do an extended research project within an area of mathematics to come up with some original results and to turn these into publications.

Q. Fair enough. Do you have any additional degrees besides what we see here?

A. That is it.

Q. Do you have any licenses or professional certifications?

A. I was at one point an analyst on Wall Street. As part of becoming an analyst you have to pass a Series 7 exam, you have to pass a Series 63 exam. So I have done that. And at one point I was a licensed stock broker, although I wasn't a stock broker. Those licenses ceased to exist.

Q. Do you happen to remember when they expired?

A. I suspect they expired when my last position on Wall Street lapsed which was 2001.

Q. And I guess we can work off this or follow along or you could just tell me off memory. Can we go through your employment history?

A. I started work actually around the time I got my Master's Degree as an assistant professor at the college at New Paltz in SUNY, which was a four-year **under**graduate school which had a small Master's program. Not that small. It had a Master's program.

I rose from position of assistant professor, became an association professor, became chairman of the department and I taught there continuously from 1963 until 1978 with a couple of leaves of sabbaticals.

In 1978 I took a position as a visiting associate professor at San Francisco State, where as a professor I taught mathematics, I taught statistics, I taught computing.

While in San Francisco I took a leave of absence from New Paltz and I took a position with a company called Timeware Incorporated. Timeware was

a small consulting company which was a vendor to the Service Bureau Corporation. Service Bureau Corporation was a large time sharing vendor of computer services. This is a dead industry. It has been dead for a long time. And what Timeware specialized in are what are called decision support products. What we did was we produced software which allowed people in the business world to use various kind of I guess analytic tools to look at their business.

So we had, for example, a graphics package, which I was not involved with, that was our big money maker. We had what was called -- I list myself here as risk analysis product manager. I was specifically the product manager for a product which allowed people to do what is called Monte Carlo simulation of financial models.

Do you want me to go into this in gross detail? I don't want to turn this into a long lecture.

What this involves is it involves basically randomizing a model looking at what this tells us about a business. So it involves tools from probability, it involves tools from statistics and it involves some knowledge of financials.

I actually went back to New Paltz. I list this as SUNY College 1983 to 1984. I went back to New Paltz previously. At that point I had a tenured position at New Paltz but I just decided I needed to change my life. I really liked consulting. I had been doing some consulting in the computer area, and one of my clients said we would really like you to come to work for us full time and that was Woodbury.

Q. At SUNY were you ever a full professor?

A. Never a full professor.

Q. Or at San Francisco State?

A. No, my highest title has been associate professor. Somehow I always -- I am sort of like being a bridesmaid rather than being a bride.

I went to work for Woodbury Computer Associates where, you know, essentially my title was director of research and development. In a consulting firm you do lots and lots of different things. I designed products basically on PCs, on mid-size systems, on mainframe systems, I wrote code, I consulted with clients, I did all sorts of things. I actually wrote a book on how to do your taxes.

Q. Let's take it one step back. Was there a particular reason why you left Timeware?

A. Timeware was located in California. Complications of personal life.

Q. Fair enough.

A. My wife and I had separated in about 1975, we had joint custody of my son. And when I moved to California the original idea was my son was going to live part of the year on one coast and part of the other year on the other coast and my son didn't like this. I wanted to have my son, so I moved back to the east coast.

Q. Fair enough.

A. I worked at Woodbury until Woodbury died, okay, and it died in 1990. I then took a position with Digital Equipment Corporation where I was a member of their consulting organization. The actual title was I was a software consultant **Two**, it is just easier to say I was a senior software consultant. That is an internal title.

What I did was I went to various clients of the consulting organization and did projects. That is what you do. It turns out that I was in an industry where there was a lot of turmoil. In about 19**90** I started at Digital Equipment Corporation and they had 125,000 employees. By 1994 they had 66,000 employees. And when you are working in a position

like that, you start to wonder do I have a job.

Q. Absolutely.

A. So what I did was I started looking around for what I would do next. As it happens, the fellow who ran Woodbury Computer Associates had gone to work on Wall Street, had become an analyst and he wanted me to come to work for him doing equity research and analysis. So I went to Paine Webber where I became an associate to him. My title was associate analyst. And I worked for him for two years at Paine Webber.

Following that I then moved with him. We formed part of a group. I moved **with** him to Deutsche Bank and the subsidiary was called Deutsche, Morgan Grenfell. And I continued to be an analyst, but at this point I became an analyst in my own right, meaning I became the guy that put my name on my reports. I was promoted to a vice president.

After a couple of years the**re** I left and I went to Credit Suisse First Boston where I was again a vice president. And after two years there I wasn't terribly happy.

Q. Sorry to interrupt, but was there another transfer with the same boss that had moved along the way?

A. By this time he was no longer my boss. He had ceased being my boss at Deutsche. I had gone with him there and then I became my own guy.

Q. Okay.

A. So I was at Credit Suisse First Boston where I was again my own guy. But I wasn't **particularly** happy. And so I looked for another position, and I got a position at Suntrust where I became a director. Within that particular industry the hierarchy is vice president, director, managing director. So I became kind of an associate professor is what it came down to, with every expectation of becoming a managing director which was kind of equivalent of a full professor I guess. And then Suntrust in about May of 2001 sold its equitable securities subsidiary to at the moment I can't remember who. But when mergers like this happen, people lose their positions. Okay.

And so I was without a job and the question was, well, what do I do. And at that point I had had really three careers, I had been a professor, I had been an IT developer slash consultant, I had been an equity research analyst. And so I looked around and as it happens I was -- I threw out my resume all over the place, and I was

offered a position at Georgian Court which worked in terms of my physical location. Actually of all things I do, I actually like teaching best. So it was nice to be back at teaching, and it was nice to have had the experience in the real world.

Q. And which classes are you currently teaching?

A. Right now I am teaching statistics classes at three different levels. I am teaching our non-major statistical course. I believe it is called -- I made up the title, I just don't remember it. I am teaching our junior- and senior-level calculus-based statistics course which is called Probability and Statistics. And I am teaching a graduate-level coarse which is also called Probability and Statistics, and it is one of the courses within our Master's program. Furthermore, this being a teaching university rather than a research university, I am teaching a calculus three class.

Q. What do you mean when you say it is a teaching university?

A. Well, if you look at the world of universities, if you have a position at Princeton then chances are you are teaching at most one or two

courses in the semester because their focus is on you doing research. If you have a position at a place like Georgian Court, ordinarily you are teaching 12 or 13 credits a semester and four courses.

Q. Are you currently working on any publications, does that inhibit your ability to do that?

A. Well, it leaves me limited time. I am actually trying to write a book both on the statistical package R and a supplement to the text I use on R.

Q. I saw R referenced in your report. Could you give me a little bit of a description?

A. When you do statistics, 40 years ago you would sit down with a calculator and a pencil and paper and you would do all the analysis you need. In the year 2009 you use a computer. In order to use a computer to do analysis you need software. And there are a variety of you know -- like anything else there are a variety of competing packages. And as it happens, R is a very, very powerful system which is both a -- which is both a statistical software package and a language for doing statistical manipulations. So it is a little bit

different in its orientation than a lot of other packages. It happens -- I use it in teaching for a couple of reasons, one of which is that it is free and my students don't have to pay for it.

Now, free in the world of software doesn't necessarily mean low quality or lesser quality than anything else. R is -- R was initially developed in the early '90s by a couple of professors at the University of Auckland who wanted to have the benefits of a language which was called S. They wanted to use it in their classes, but S was very expensive in its commercial implementations. So they started writing software which would do the same thing so their students could use it.

In the world of computers there is a vast world of people who are either professionally interested in certain things or merely enthusiasts who are willing to pool their energy and effort to develop software packages. The guys who developed this essentially put it out there in this world of software developers in the mid-90s and it attracted a huge professional following.

In something I wrote I pointed out that people have talked about this as the standard software package for all academic researchers in the

world. Clearly there are lots of different people who use different packages, but it is one of the outstanding packages. It is developed by a central core of people who are very celebrated in this world. The man who actually originally developed S is on the control board for this. It is a package where you can actually access almost all of the advanced tools before you can almost anyplace else.

Q. And you are writing a book on its use?

A. Well, one, there are already a number of books out there. Part of it is I look at these books and my feeling is can somebody who doesn't know what they are doing really figure out what they are doing from this book. So you always figure I am going to explain this better than anybody else. It is a little bit of a conceit. Whether I will succeeded or not, I don't know.

Q. Is that with the intention of using it as a textbook teaching type of thing?

A. Well, it is a combination of things. One is that as an academic you want to get your name on things so people will say, oh, he has been published. Hopefully people will use it. One of things I do is I write notes for my classes, and that is partly the basis for what I would use as a

book.

Q. Do you have any other publications on the subject?

A. No other publications on that. I published several papers in probability theory in the 1970s. In the 1980s and into the early 1990s I was doing a lot of freelance publication on topics in the computer industry.

Q. Okay.

A. So I published in a whole bunch of magazines there. I was editor for a while of a newsletter. I published this book on how to do your taxes with Lotus 1-2-3. Actually I ha**ppen** to be listed as the second author, but I am actually the person who wrote it. I wrote another book basically on a contract basis for somebody.

Q. The articles where you just referencing from the '70s on probability, could you give me a little bit more of an overview on that if you can recall?

A. Well, actually one of them -- two of them were actually -- actually they were all pieces of my PhD thesis. The three papers were published in the Illinois Journal of Mathematics, the Annals of Probability and the Proceedings of the American

Mathematical Society. Two of them listed my thesis advisor as my coauthor because he really worked extensively with me. You recall that the title of my thesis was Random Walks on Countable Abelian Groups. The two papers, the one in the Annals of Probability and the one in the Illinois Journal, were about 15 pages each and they each dealt with what are called recurrence problems. Remember the idea of the random walk?

Q. Yes.

A. It was on flipping a coin and deciding where I am going to go. One of the questions you can ask is what is the probability that I come back to where I started. That is called a recurrence problem. It doesn't sound like a very interesting problem in one dimension. It actually gets very, very interesting in three dimensions. Because in a certain sense these groups I was looking at correspond to a kind of a dimensionality. It is sort of an **a**bstruction of dimensionality. It could be fairly interesting to those who -- it is interesting to people who are heavily interested in this stuff.

The paper in the Illinois Journal dealt with one category of groups, recurrence problems on

one category of groups I think that was finitely generated countable groups. The other dealt with another category of groups, and at the moment I can't think of what the category was. It might have been direct sums of things.

Q. Okay.

A. The paper in the proceedings was a slightly different kind of thing. I had actually looked at some ancillary problems which were related to the central problem of my thesis. And the ancillary problems sort of concerned how many times you visited certain points and the behavior of the number of times you visited certain points. And there are these things in mathematics called laws of large numbers. They are actually the technical equivalent of what we think of as the law of averages.

Q. Okay.

A. There are different types of the laws of large numbers, there are what are called strong laws and weak laws. And if you take a graduate course with me, I will explain what those are.

What I had done is I had examined this particular problem of counting the number of times you visited and I had shown that there was a -- that

it obeyed a strong law of large numbers, and that was the paper I had in the thing. I mean there is this whole sort of change of research. I had picked up a journal one day and saw some people dealing with this problem, and I looked at what they had done and I said, well, I can do a little bit more than they did and that is what I did. And the Proceedings is actually a very high-prestige journal, so it was wonderful for me when my paper got accepted there.

Q. Have you, since graduating from your doctorate, done any postgraduate continuing education?

A. In the sense that have I taken formal courses, no. Do I attend seminars, do I attend meetings, yes. One of the things I did, although I haven't done it recently, there is -- when I was on Wall Street I became very interested in finance -- well, I learned something about finance obviously. I became very interested in finance and its relationship to mathematics.

There is actually a specialization of people on Wall Street called "quants". I was not one. Quants is actually short for quantitative. There is an area of finance which is called

quantitative finance. They are the people who are in trouble right now. They are the guys who brought you derivatives. I'm sorry to say that I am interested in that, okay, although I wasn't doing that when I was on Wall Street. I developed an interest in that.

It actually happens to make use of a very interesting array of techniques and a knowledge base which I possess. Okay. In particular it calls upon you to know quantitative finance. You have to know probability theory, you have to know statistics and you have to know them deep and well, and on top of that you need to know something about finance. And so this was an area which I decided to learn something about.

And it turns out that Princeton has -- I think they call it an institute. They have an institute for mathematical finance. It may have a different name. It is housed on Prospect Street right next to their economics department. And I happen to have learned that they had this very interesting group and they had a research -- they still have it. They have a research seminar there that meets on Wednesdays at 2 p.m. And For a number of years I attended that research seminar quite

regularly. I don't know whether you would call that continuing education.

Q. Yes.

A. That is continuing education. Unfortunately I actually have courses scheduled which conflict with that, so I haven't been able to go to that for a couple of years. It is funny I g**et** CEU credits every year. I grade AP calculus exams and the**y** give me CEU credits. So if I want to know do I have CEU credits, the answer is yes. But nobody has ever asked me for them.

Q. Have you attended any seminars in the last five years?

A. Well, I attend meetings of the Mathematical Association of America. I don't think I attend any seminars, but I do read a fair amount.

Q. Do you have any subscriptions to any specific journals?

A. I subscribe to the American Mathematical Monthly, I subscribe to what is called Mathematics Magazine and I may have a subscription -- I had a subscription, but I'm not sure if I still do, to what is called the College Mathematical Journal.

Apart from that, I get the New York Times every day. I get lots of magazines, but not things

that would be considered journals.

Q. During your time, either while you were in school or as a professor, have you received any awards or honors specific to your field of study?

A. None that I can think of offhand.

Q. Have you taken any courses, whether formal or more in the seminar sense, that provided experience in applying statistics in the context of experimental science?

A. No.

Q. Have you read any journals dealing with that topic?

A. I have read articles on it. I certainly teach statistics.

Q. Right.

A. And within my teaching of statistics, I certainly talk about its use in science. I haven't taken courses, no, but I certainly have read about it.

Q. Could you describe a little bit more? You said in your teaching you actually teach about those types of applications?

A. Sure.

Q. Could you just describe for me a little bit more generally what it is --

A. In particular in an elementary course you talk about issues like how do you detect causality. And so you talk about creating randomized experiments. You talk about methods of gathering information. You don't talk about laboratory techniques, but you certainly talk about how do you gather information, how do you gather data. Okay. What sort of issues can come up in gathering data.

Q. Okay. I know I asked this question more generally about have you ever been deposed before, but have you ever served as an expert in litigated cases before?

A. No, I have not.

Q. Have you done any work, and this might seem like an abstract question, in applying your knowledge of statistics or any other outside of a litigated case, whether it be in an administrative hearing or some sort of state agency hearing?

MR. PINCUS: Objection to the form of the question.

You may answer.

A. Not that I can think of.

Q. Okay. Have you ever worked with Mr. Pincus before?

A. No, I have not.

Q. With Dr. Hill?

A. No, I have not.

Q. How did you come to meet Dr. Hill?

A. I received an e-mail from Dr. Hill telling me that she was interested in finding an expert witness and asking whether either I knew of anybody or was I interested in doing so.

Q. Do you happen to have a copy of that e-mail? Do you retain your e-mails?

A. I know I retain some. I don't know if I still have a copy of that one.

Q. I might make a request of Mr. Pincus.

After you received the e-mail from Dr. Hill, did you set up a meeting where she came in and met with you?

A. Yeah.

Q. And could you describe for me that meeting?

A. Actually there was an exchange of e-mails. We arranged to meet. She told me a little bit about what the issues were. She asked about whether I could -- you know, she basically made some assessment of my level of knowledge and whether I could actually deal with the issues. She told me a little bit about the previous hearings about what

had gone on with ORI. And I discussed what my approach would be to dealing with these things and that was about it.

Q. Did she provide you with any documents at that time, that initial meeting or via the e-mails before the meeting?

A. I actually think she -- I don't remember exactly. In other words, I can't tell you the exact sequence in which she gave me stuff. She provided me with a copy of the Mosimann article.

Q. Okay. Just to clarify, I think you referenced two Mosimann articles. Do you know which one she gave you?

A. I think both of them.

Q. Okay.

A. I think she may have at that time -- at one point or another, she certainly gave me copies of her "I Am a Whistle Blower" statement.

Q. Okay.

A. She gave me -- she has at various points given me the documents about her exchanges about the internal investigation at UMDNJ, et cetera. So I have read those. It was a long time ago.

Q. I'm not going to mark these, but I am going to kind of speak through them and **see** if these

are the ones you were provided.

MR. PINCUS: Are you going to mark them?

MR. FLYNN: No I, am just going to reference them.

Q. I Am a Whistle Blower?

A. Yes, I read that.

MR. FLYNN: I'm not going to go through the documents now unless you want to.

MR. PINCUS: No, I don't particularly want to. Go ahead.

Q. A document noted Scientific Misconduct?

(Whereupon, the Witness looked at the aforementioned document.)

A. I may have seen that, I just don't remember.

Q. A document entitled Time Line?

(Whereupon, the Witness looked at the aforementioned document.)

A. I don't recall having seen that.

Q. Okay. A letter that was written to a Dr. Price at ORI?

(Whereupon, the Witness looked at the aforementioned document.)

A. I don't recall. I actually don't recall seeing it. I know for a fact that I saw the first

one.

Q. Right.

A. I also know that I had a bunch of papers.

Q. Okay. Have you retained copies of those papers?

A. I have copies of a bunch of papers that I got from Shelly at various points and I probably -- I haven't really thrown out any papers that I received.

Q. Okay.

A. That I know of.

Q. A PowerPoint presentation?

A. That I definitely went through and found that some of it I understood and some of it I didn't.

Q. This is entitled Analysis of the Findings In Box Number Six?

A. That may have not been the same one. I went through a PowerPoint presentation. I can't swear that that is the one I went through.

Q. I do have an another one, just to be fair to you. Evidence Supporting Allegations of Fraud At the NJ Medical School?

A. I might have very well gone through that.

Q. Fair enough. Did you happen to see a

document called Written Disclosure that was prepared in this litigation?

A. Again I am not sure.

Q. Okay. Fair enough.

Let's go back to your meetings with Dr. Hill. About how many meetings would you say you had prior to drafting your report?

A. I would say probably about two maybe, maybe three.

Q. Was anyone else present at these meetings besides you and Dr. Hill?

A. No.

Q. You had mentioned that Dr. Hill had provided the Mosimann articles to you. Had you ever heard of Dr. Mosimann or reviewed his materials prior to being provided those articles?

A. No.

Q. I know we had talked about some of your teaching on the subject, but had you ever written any articles or dealt a little more in depth to the concept of applying statistics to find fabricated data or anything in that matter?

A. No.

Q. I am going to show you what we previously marked as Pitt 2, a copy of your report, and take a

look at that and make sure it is a true and accurate copy.

(Whereupon, the Witness looked at the aforementioned exhibit.)

A. It actually looks absolutely accurate. It is not the copy I printed because the copy I printed has slightly larger text.

Q. Okay.

A. The font size is larger but it looks identical.

Q. Okay.

MR. PINCUS: The only other thing I would note while Dr. Pitt is looking is I believe the copy of the report we originally provided to you is a couple of the documents were in color as I recall.

THE WITNESS: I provided one page in color and that was page 15.

MR. PINCUS: Okay. Because I believe looking at one of my copies here that it is page 15 and I thought it was page 7 too, which is the same chart but a smaller version. If that becomes an issue then you let me know.

THE WITNESS: It actually is in color. I think that the printout I have I printed it out

in black and white.

MR. PINCUS: Okay. I'm just saying if it becomes an issue and if you need a color copy let me know.

THE WITNESS: Well, the last page is that chart, and I specifically put it on the last page so it would be seen larger and with the colors. That is why in the particulars text I refer to that --

Q. So this chart you are referencing on page 15 is the exact same chart that is on page 7?

A. Right.

Q. Okay.

A. One, I wanted to print it so that people could see it large and so that people could see the colors. And the way I was printing this is I was not printing it on color print**er**.

Q. Could you tell me when you drafted this final report because there is no date on this?

A. Roughly February 18th or 19th.

Q. Okay.

A. But I couldn't tell you the exact date.

MR. PINCUS: That would be of '09?

THE WITNESS: '09.

A. Let's say late February '09.

Q. Okay. If I could just turn your attention to the back for a little bit for this first question. Your references listed on page 13?

A. Right.

Q. Is that a full list of the references you used?

A. Actually there were lots of papers I read in the process of doing this. I mentioned some which I felt were germane and germane in a variety of ways. But, no, I read other papers.

Q. Okay. Are your conclusions in this report based on any other references not listed here?

A. No. Well, I mean the answer is, one, I don't give you a reference in here to the Chi-Square Test. Chi-Square Test is a standard statistical test, so I didn't give you a reference to a statistical text book. Okay. I gave you references to some papers which are related to the -- related to this question of detecting fabricated data and which address it in a variety of ways. They cover most of the literature I am familiar with on detecting statistical data.

Q. Okay.

A. I hope that came across clearly. Meaning the topics they cover pretty much are the same

topics other people cover.

Q. Okay. When you say other people, do you have any specific references in mind?

A. No.

Q. Is this the only copy of this report that you have generated in this case? And I don't mean copies as in printed out copies. I mean were there any drafts of this report drafted prior to this final version?

A. Well, I certainly printed out drafts, I went and I reviewed it, I looked at it.

Q. Did you circulate those drafts to Dr. Hill and Mr. Pincus?

A. I showed some of the stuff to Dr. Hill.

Q. And did you make changes after?

A. Well, if she said to me something was unclear, I went back and I looked at it. She didn't tell me to change anything but she said maybe I didn't understand X.

Q. Can you think of any examples of anything you changed after speaking to Dr. Hill?

A. No.

Q. You kind of touch on this in the beginning of your report and it is kind of a more general question, what were you generally asked to do when

you were asked to provide this report?

A. Okay. What I was asked to do was to look to see whether there was any internal quality of the numbers. I looked at this not from the point of view of -- I had to have some understanding of what the processes which produced these numbers were to comment on them. Okay. But what I was asked to do was to look at the data and understand what statistically was going on, whether there were any anomalies in it. Which in fact would point to they are not having been -- having been fabricated.

Q. By finding a statistical anomaly does that automatically lead to a conclusion of fraud?

A. The answer is no.

Q. There is other possibilities for why the anomaly exists?

A. One of the references I give you in here, okay, the reference to the particular paper, the Preece paper, Distribution of Final Digits in Data, it is the third from last reference I give you. Okay. It is an interesting paper in that regard, because the specific thrust of that paper is that you can often find or you can sometimes find other reasons why you are going to have statistical anomalies.

So part of the question is understanding the process well enough to know whether you can find another reason something might have happened. Okay. So, for example, one of the issues I deal with in here is the frequency of terminal digits. And what appears to be an issue is the fact that certain digits occur less frequently than you would expect them to and others occur more frequently. There are possible explanations for this. One possible explanation is that a person misunderstood the digit. Now, what is germane is that here -- and that is what the Preece article deals with. And the answer is here you are reading the digit digitally. Okay. But when you see a readout digitally, you can't make a mistake about whether it is a four or a five, it is simply a four.

Another possibility is that the machine you were looking at was broken. Okay. You know, you have a digital readout and somehow or another there is a defective light, it never shows a four, it always looks like a seven. Okay. So that could explain it? That is part of what I tried to look at in looking at the data.

So one of the questions is could the machine have been broken? Well, that is where I

discovered or found that there were plenty of occasions when the data looked perfectly reasonable during the same time. Okay.

So as to your question is it possible that the numbers can be anomalies, yeah, lots of things can happen.

Q. Some of this stuff I am not ignoring it but we will kind of work up to it and get to the heart of your conclusions. Well, I guess we can get right to it I guess.

Did you personally do all the work that is in this document?

A. I personally did all the work that is in this document.

Q. One of the things that jumped out on me, and this is might be a style thing, you reference we or us and I am just wondering who that may have been?

A. Style.

Q. The we or us is Joel Pitt?

A. My feeling is when you write a professional paper you write it as we.

Q. I just want to know that none of your students were doing any statistical runs on the software or anything like that?

A. No.
Q. I just wanted to clarify.
A. It is just if I wrote a report on Wall Street then it would be the same thing, we.
Q. Okay.
A. Maybe I have a split personality.
Q. I don't think any of us are qualified to examine that right now.
MR. PINCUS: One part of me agrees with you and the other part doesn't.
Q. I guess what I did is I kind of went through it, and I guess we will go through it a page at a time and that might be the easiest way to do it.
A. Sure.
Q. One other overriding question, and I might ask this I guess a little unsophisticatedly is that your conclusions here are based on certain assumptions, correct?
A. I try to be as clear as possible about what my assumptions are.
Q. The primary assumption is the uniform randomness of numbers?
MR. PINCUS: Objection to the form of the question.

You may answer.

A. No.

Q. Uniformity -- I am trying to say it as a way as a lawyer trying to say --

A. Within certain contexts I have a reasonable expectation that certain things are going to be uniform. For example, when I look at the terminal digits, the issue here is you are kind of grabbing large samples from something. Okay. And when you grab these large samples, you grab hundreds or you grab thousands, you are not grabbing them in a way in which you are going to affect the last digit.

Q. Okay.

A. Okay. Now, the question is, one, you can argue well, you know, we do it that way. Well, how can you find out whether we do it that way? What you do is you look at what happens when other people grab the same thing. That is why we use controls. Okay. So what you do is you start with certain understandings of how things work, and then you look at things which either confirm or disconfirm it.

So you are right about terminal digits, I am making the assumption that, given the circumstances in which this is done, those are going

to be uniform. Then I examine that assumption from a variety of perspectives. Okay.

Again -- I mean the word uniform does show up a lot. But it is actually different senses of the word uniform. Okay. When we are talking about terminal digits, we are simply saying that zeros show up as often as ones and twos and threes.

When we are talking about these ratios in the second test, what we are expecting is that -- if we look, and I can't show this on the transcript, but we are going to be picking things of roughly the same size and we are going to pick three things of rough roughly the same size. Well, when we pick three things of roughly the same size, one of those three things is going to be the biggest, one of those three things is going to be the smallest and ordinarily you would expect the one that is neither the biggest nor the smallest to be as about as close to the largest one as it is to the smallest one. Okay. And again that seems like a pretty plausible assumption, but there are a variety of ways in which you can examine the plausibility of it.

One way to examine the plausibility of it is you look at what happens with other people who pick three things. Okay. So in other words I am

not just assuming uniformity. I am trying to see whether other behavior conforms to that. So that is one of the things I actually talked about in this report, I looked at other data. Okay.

Another thing you can do is you can try to, starting with an understanding of what the probabilistic mechanism that underlies the selection is. What you can do is you can do a computer simulation of the same thing. Sometimes this is called a bootstrapping type thing. You essentially tell the computer go ahead and pick three numbers, okay, and pick three numbers by a similar random mechanism. And when you pick the three numbers, calculate for me the ratio of the middle minus the lowest to the upper minus the lowest. Okay. Make a record of that. Do that again. Do that again. Do that again. And do that 5,000 times. And now show me what those ratios look like. So it is not merely an assumption of uniformity.

Q. Okay. Just to bounce around a little bit. At one point here, in the first one the relative frequency of least significant difference, you are addressing the question both a-priori and empirically?

A. That is what I was saying here. The

a-priori is I am starting with this understanding of the process, and I am saying based upon process I don't see why any digit should show up more frequently.

Now, if you told me that somebody was reaching into a bin and picking out a handful of jellybeans, then it might be plausible that sometimes they pick seven more jellybeans more often than they pick two jellybeans. But if you tell me that somebody is reaching into a bin and pulling out something like 2,000 jellybeans, they generally are not going to be able to pull out 2,000 jellybeans with such precision that they are going to get 2,001 jellybeans more often than they get 2,005 jellybeans. There are intermediate digits which I am not talking about here. But they are not going to have that type of precision. That is the a-priori approach.

Q. Okay.

A. And it is plausible. But somebody could say, oh, yeah, I just have this real technique for doing this. So what you want to do is you want to look at what happens empirically. You want to look at what other people produce when they use the same procedure.

Q. Okay.

A. And so what I did was I looked at all the data that we got from that particular lab.

Q. Okay.

A. I looked at Dr. Hill's data, I looked at Dr. Howell's data, I looked at Dr. Lenarzyk's data. And in looking at that data I said, well, did their last digits look random? They are all doing roughly the same kind of experiment, they are all pulling out roughly the same kind of thing, and I don't see that kind of nonuniformity.

Then you can argue that Dr. Hill and Dr. Lenarzyk to some degree are the people of interest in this group. I actually looked at everybody else's separately. Still uniform.

But another question is what happens at other labs? That is I why I actually asked Dr. Hill to contact other people to see whether we could get data from other Coulter Counters from roughly similar experiments.

Q. Just to clarify, on that data you are referring to the data from which place?

A. Case Western and I forgot the other one.

Q. UT Southwestern Medical Center of Dallas, Fort Worth and Case Western. Do you still have that

data?

A. I do. Actually I got one in the form of an Excel spreadsheet. I got the other in the form of a faxed set of papers. I don't know whether I have the faxed set of papers, but I have what I hand entered on it.

Q. And Dr. Hill provided those to you?

A. Yeah.

Q. And did you speak to any --

A. I didn't speak to any of them.

Q. Okay. Other than that data from those two universities and the listed Bates numbers here at the very end of your report --

A. No other data.

Q. No other data. Okay.

A. I mean apart from the stuff that I simulated.

Q. Fair enough. Speaking of the simulations, when you ran the simulations did you do a printout of those simulations?

A. No, but I have actually sort of chaotically saved some of the sessions.

Q. Okay.

A. I can certainly reproduce the simulations at any particular time because I have the -- and in

fact that is the whole point of the simulation, that when you do it again I am going to get different numbers but I am going to get -- I believe I will get roughly the same results.

The point of simulating is to get some idea of what random mechanisms produce. And one of the interesting features of the way in which randomness works is that even though things are random when you take them one at a time, but when you do them over and over again there are patterns. This is what is called the laws of large numbers. So if I perform a simulation 5,000 times of something, in general if I do -- if I sort of pick new random numbers and do the same thing again, I am going to see something which is pretty close.

Q. There is an interesting point, and you mentioned this before with your jellybean example. If I grab seven to maybe twenty, but if I get up to 2,000, this might be a general question, but where is the line? And it might not be an actual line in the sand, but where these statistics start to come in to play and provide numbers where you can use rather than the lower number doesn't seem to be as accurate or fit the model I guess is the proper question?

MR. PINCUS: Objection to the form on the question.

You can answer.

A. I can't give you a precise cutoff point, but I can be confident that people that are picking out hundreds of jellybeans are not going to be that accurate, not controlling the lowest digit.

Q. Hundreds?

A. Probably 40 I would say. If you gave me a jar here and you started reaching in and you were picking somewhere in the order of 50, I would be willing to bet that you would -- I am not absolutely sure, but I will bet a lot of money that if you were picking out hundreds then those last digits would be pretty uniform.

Q. Fair enough.

A. We could try it.

MR. PINCUS: I will run over to ShopRite.

A. In effect, that is what I am doing with my simulations, I am just keeping the grease off my hands, the sugar.

Q. And from gaining weight from the candy.

A. Right.

Q. In the second paragraph there on the first page you -- the first line you reference that the

results of Dr. Bishayee's experiments were reported in two publications and used as preliminary data for a funded grant application. Did you review those publications or that grant application?

A. No.

Q. And your knowledge here of the results having not been replicated, where did you obtain that information?

A. I got that from Dr. Hill. I also looked very quickly at the other expert's thing, and he seemed to indicate that they weren't related. I did it in such a cursory way.

Q. Dr. Robbins?

A. Yes.

Q. Did you review his report before finalizing your report?

A. I did see it before mine, but I glanced at it. I can't say I reviewed it before finalizing mine.

Q. Okay. Later in that paragraph you reference that Dr. Hill believes that it was impossible to have honestly obtained the results Dr. Bishayee reported, and then another sentence down says she asked us to review that data to confirm or disconfirm her belief.

Are you working from there assumption backwards where are you reviewing the data?

A. I was reviewing the data. She said I don't think this is legitimate. I was thinking how could I look at data and ask questions about how that data is not generated honestly.

Q. Do you feel that you were able to review the data objectively after having met with Dr. Hill and read her positions on --

A. Yes, I really looked at the numbers.

Q. Okay. Then you reference your three techniques, but you go in to more specific later so I don't want to talk about the general. But in number two at the bottom you said, although we cannot assign a specific probability to the results here, and I was wondering if you would just explain to me why not?

A. Okay. First of all, one, you don't actually say how probable results are, you say how improbable they are. Okay. And the issue here is I am working with a rough model, and I don't have a complete probability theory associated with it. So whereas I can perform -- if I am starting with a very specific model that this is definitively uniform, which is the specific model I am using in

one, I can then employ the Chi-Square Test to say, well, I generated these from a uniform distribution. What I say here is that these should be roughly uniform. Okay. And it certainly makes sense, but I can't measure because I am not dealing with something which is exactly uniform, I can't calculate the probability.

Now, what I could do is I could calculate the probability of getting these results under the assumption that they are perfectly uniform.

Q. Okay.

A. And in fact I can tell you that it is extraordinarily small. But I don't entirely subscribe to the belief that it should be perfectly uniform, so I can't assign a probability. I don't know exactly what that distributions is.

Q. Can you tell me why you don't believe that it should be perfectly uniform?

A. Actually because I tried to prove it, and I haven't been able to come up with a proof.

Q. Okay. Fair enough.

A. Mathematically that is the appropriate way to do it. What I was able to do is I was able to prove under certain fairly restrictive circumstances it is exactly uniform. The uniform is a little bit

over those restrictive circumstances.

Q. When you say the model, what model are you referring to?

A. The model of what is going on when you pick these things, what is the underlying randomness.

Q. Okay. So for at least number one, the relative frequency at least -- the model is the Coulter counts?

A. No, the model in number one is that the digits should be really precisely uniform.

Q. Okay.

A. And what we did is we applied that -- we applied -- based upon that model, we asked what is the probability that we saw the specific distribution of digits that we got.

Q. Okay.

A. And we asked this on a variety of levels. We asked this on the individual experiment level, and that is what this chart on page 15 shows.

Q. Okay.

A. It shows the answer to that probability. It says that we generally -- that we mostly -- first of all, with virtually every experiment run by anybody else, okay, the probability of getting the

kinds of results we got or worse. Within statistics this is a piece of statistics called hypotheses testing.

What we do is we start with an assumption, and then we say, well, our actual results diverge from the assumption and we look at the way in which they diverge from the assumption and we say what is the probability, if our assumption is true, that they diverge or worse.

Q. Okay.

A. So if -- for example, if I look at this particular -- I look at an experiment by somebody else, let's say 12-15-2000, and I see an O up here at point eight.

Q. Got it.

A. That says that the possibility of getting the result they got was about eight-tenths. Things which have probability of eight-tenths happen 80 percent of the time, and I am not terribly surprised. Okay.

I look and I see some O's on this chart which are down at the point two level. If you look at 12-15, you see a couple of O's. They happen at about 20 percent of the time. Things that happen 20 percent of the time happen 20 percent of the time.

We are not terribly surprised by that.

Then I look at this collection of B's which are under the line at point one. Those B's say if these digits really were uniform that these things should have happened less than one one-hundredth of the time. Now, in fact a lot of them, according to the calculation, happen less than one in a billion times.

And so what I see here is a whole bunch of experiments in which I see here, you know, something like 40 or 50 experiments over a period of time in which something which should happen one out of every billion times is happening.

Q. Okay.

A. Okay. So that is what I mean by assigning a probability. And I have a very specific model based upon which I can calculate that probability, and I have a very specific test which gives it to me.

MR. PINCUS: Are you done with your response? Would you like him to read back towards the end of what you were saying for you to pick up and conclude?

THE WITNESS: I thought I actually concluded.

MR. PINCUS: Why don't you do that for sure because I don't want the record to be incomplete.

(Whereupon, the aforementioned testimony was read back by the Reporter.)

Q. For purposes of maybe me learning a little bit today, would a similar concern raise if a line was drawn above 90 percent? Like somebody is coming up with numbers that are 90 percent of the time they should come up but if they are coming up -- basically what I am saying if his B's are all towards the top?

MR. PINCUS: Objection to the form of the question.

You may answer.

A. I have never seen that so I really -- it is a funny kind of question. I guess the science, to the extent that statistics is a science, practice in statistics is that you look at -- that what you are interested in is seeing whether unlikely things occur. Likely things by their nature occur.

Now, at the risk of saying too much, you know, the recent case of Bernie Madoff, whose results were too good, okay, I suspect if I saw something where the results were much too good I

might have suspicions. But seeing results which are too good, you have to know more to throw them out.

Q. Okay. Fair enough.

On page two of your report, the large paragraph right above relative frequency, I guess that first sentence that goes back to something we discussed earlier, the mere unlikelihood of an event certainly does not imply that it cannot have honestly occurred by chance.

MR. PINCUS: Is there a question?

Q. I'm saying that goes back to what we were talking about earlier, is the anomaly doesn't automatically lead to a conclusion of fraud, correct?

A. It depends on the anomaly, on the size of the anomaly. Not every anomaly leads to a -- what I am saying here is that not every anomaly leads to a suggestion of fraud. If I run into somebody who says I was a -- I won the lottery, okay, I'm not going to say you cheated. And in fact I know of people who won the lottery twice. There are well documented examples of people who won lotteries twice. If I ran into somebody who won the lottery 20 times, I think anybody would believe that he committed fraud. When I say the lottery, I am

talking about something like Mega Millions. It ain't going to happen.

Q. Is it impossible or unlikely?

A. It is not impossible. Okay. If the chances -- it is possible.

There is a science called statistical mechanics. And statistical mechanics, among other things, talks about what happens with the molecules of air in this room. And it is possible that every molecule of air in this room could accumulate in the corner of the room to which I am pointing but he can't record. Okay. It is possible. Okay. The probability of it is extraordinarily small, probably in the order of one over a google, very, very small number.

If you ask me if it'**s** possible I would have to say yes. On the other hand, if somebody walked out of this room and was gasping and said I am going to sue Mr. Pincus because all of the molecules in this room accumulated in the corner and I couldn't breathe, I would say he is lying.

Q. The last sentence in that same paragraph, When our statistical results are considered in combination with, and you list the direct observation of scientific misconduct. When you say

the direct observation, who are you referring to, Dr. Hill's observations?

A. Yes.

Q. And the irreproducibility and apparent impossibility of reproducing Dr. Bishayee's results --

A. By the way, I think that is actually just a mild statement of my position. Okay. I frankly -- looking at just the numbers, I believe they are fabricated. I believe it is inescapable, just as I believe that if the molecules -- if you told me the molecules accumulated in that corner, I wouldn't believe you.

But I was trying to actually state this in, you know, what I felt was a reasonable fashion. Okay. In other words, you look at the whole picture. To me the whole picture spells it out. But I suspect, I don't know -- I don't know, I don't know whether I should have written it that way.

Q. So you are saying today you are not necessarily sure that you need the "in combination with," because you feel that it stands alone?

A. I do feel it stands alone.

Q. Moving on to the least significant digits analysis. When we say least significant digits, I

feel like I have an idea what it means but I want to clarify. The least significant digit in a hundred is always the right most digit, and in most cases is that digit many times does not contain any information that might be useful to a scientific experiment question?

A. Yes. There are some cases where it might be valuable. It is the nature of the experiment. From what I understood about these experiments and all of the other things I see bear it out, it is not germane here.

Q. And where does your understanding of that come from?

A. What I have seen about how the experiment is conducted. You know, what the level -- I can't tell you -- I can't give you an accurate description of what goes on in the Coulter Counter experiments, but I know somehow or another it involves growing cells out of something by a mechanism which is relatively crude. Meaning it is relatively crude relative to the magnitude of what you are doing. Just as grabbing handfuls of jellybeans is relatively crude. Actually it is much cruder than that.

Q. In addition to the Coulter counts, you are

also referring to manual counts of colonies in this section, correct?

A. Yes.

Q. Describe to me the difference as you understand it.

A. As I understand it, in the colonies they actually eyeball these cells and they move their fingers along and they count the numbers of cells they see in this particular me**edium**.

Now, one, there is much more of a chance of other or in that. The Coulter Counter is a machine which actually counts the numbers. Okay. So the Coulter Counter as far as I know will do a reasonably accurate job.

Now, one, in a way I would expect that there is more -- if you read this paper I had referenced earlier, the Preece paper, I would say there is probably more of a chance when you are personally manually counting that, you know, you are going to roll over and say fours more often than fives than a machine is going to do it.

There are certain things, one, in a counting -- well, I swim laps. I count laps. Okay. Now, after I have counted 25 laps and I am swimming my 26th lap, I can't remember whether I am really on

my 26th lap or on my 25th lap. That may be a defect of my mind, but I believe other people have the same defect.

Now, it wouldn't surprise me if I sat there and I counted 300 cells by hand if by the time I got to the end I wasn't sure whether I counted 304, 305 and 306. And in that particular case, I might decide on the four more often than I decide on the six. So I think there might be more of a chance of a non-uniformity on the cells than on the Coulter counts.

Q. Does that impact the ability to compare those numbers together in this model?

A. No, because one I didn't lump them together.

Q. Okay.

A. And in fact my primary, you know, source of data is the Coulter counts. That is where the major issue comes up. But I decided to examine the other simply to see whether I have the same thing going on there. And I do have the same thing. To me it is not as compelling because I could think of **other** reasons. I don't know, in whatever culture Mr. Bishayee comes from, you know, maybe people like fours, they are lucky. It happens.

Q. With the Coulter counts that you were reviewing for your report, are these like a tape register receipt or are they handwritten?

A. What I have is handwritten papers. On the handwritten -- you know, I sat there with page after page typing in the numbers that I saw on those pages. Pretty much every one was handwritten. I don't know whether -- I don't know whether I ever saw anything that was printed.

Q. Okay.

A. As far as I know about the machine, I don't know that the machine creates a tape.

Q. Okay.

A. I have seen a picture of it, and it has a digital readout.

Q. Would it be fair to say then that underlying application of your models, the premise is that the human being writing down the number does it exactly?

A. Underlying my model is that human beings make mistakes, but there is unlikely to be a lot of mistakes which are that practical. In other words, somebody who is reading a four is almost always going to write down a four. Somebody who is reading a five on the screen is almost always going to read

it. On the other hand, someone who has 304 jellybeans in his hand is going to miss the last digit more often than somebody who is reading it on the screen. In other words, if you physically counted, you are going to make more mistakes than reading the number off the screen. Is somebody not going to make any mistakes, no.

Q. In addition to mistakes, I guess the question I have is is that the rightmost digit has no informational value to the science at issue, and now with the concepts of we are also relying on the preciseness of the human writing down the number, if they are writing down a number that they know has no significance, does that now create an additional circumstance for error?

MR. PINCUS: Objection to the form.

You may answer.

A. I don't believe so.

Q. One of the things you reference in here is the ORI report, and I know you mentioned the ORI investigation. Do you read that report?

A. I did read it.

Q. Okay.

A. I don't recall when I read it or what I read in it, but I'm sure I read it.

Q. Do you recall if they did any statistical analyses in that report?

A. I don't recall. I mean I really just don't recall it clearly.

Q. Okay. Moving on now to page three I guess. You have a quote there from Dr. Mosimann. At the very end of his quote he says, specifically the selection may be due to conscious or unconscious human choice in making up numbers.

What is your understanding of that statement, how he is applying that to his model?

A. My understanding of what he is saying is that if somebody is making up numbers, okay, they are -- there is a strong possibility that they will not be putting down those numbers uniformly, that they will be either making conscious choices in putting them down or unconsciously making choices. That is my understanding.

Q. Okay. Kind of maybe correlating between two of your three conclusions, is would one of those conscious choices to be finding the average number and using that to sway the other numbers?

A. I don't see how that is related.

Q. Okay. Fair enough.

A. They are different questions.

Q. Okay. Fair enough. I apologize. Sometimes I ask a question from a lack of understanding not from a --

A. No, I understand that. They are really two different questions. I could go into my professor mode.

Q. Another time.

A. Yes.

Q. I know we had touched on this before, and maybe you could just describe for me again on page six you reference the Chi-Square Goodness-of-Fit Test. Could you just generally explain to me that test is and how it works and how it is applied?

A. Professor mode. What we are applying here -- notice how I even automatically say we?

What we are applying here is a technique for asking how far the data I see is from the model I project. Okay. So, for example, you give me a -- we will work with a concrete example. Okay. We walk into a room and you say, you know, everything you have been telling me says that human beings can't pick numbers really random. Okay. But I'm really better than that. I can pick numbers at random. So I say to you, okay, sit down and I want you to write down 2,000 random digits. Okay. And

so you sit down with a piece of paper and you write down 2,000 numbers. You come outside and you give me the piece of paper.

What I do is I sit down and we have 2,000 numbers here, and if you are really doing it random**ly**, I expect that roughly 200 of the numbers you have written are zeros, 200 of the numbers you have written are ones. Now, I don't expect exactly 200, but I expect it is going to be close to it, 200, 200, 200, 210. 200 is my model.

Now I count the number of zeros you came up with. Okay. And what I do is I take the count of zeros and what I do is I look at how far it is from 200 relative to 200. Okay.

Now, actually what I do is I square it, and there are little bits of complexity in the thing. In effect, what I am doing is I am calculating a number which shows me how far the numbers you gave me are from what I believe the distributions is and the distribution you are claiming you can come up with. And the laws of probability say that there is a very small probability, if you were really coming up with the numbers uniformly, that your number would be very far from essentially zero. Okay. Because, you

know, in other words, if you had 200, 200, 200, 200, your Chi-Square value would be zero. Okay.

The further you are awa**y**, the bigger this number I am going to compute is. And so what I do here is I calculate that number for everybody's numbers of digits. Okay. And I then look up a table of the Chi-Square distribution and I say how probable is it that you get that value. And for what pretty much everybody else did, you know, it happens 50 percent of the time, sometimes it happens 80 percent of the time, sometimes it happens 20 percent of the time. But those aren't things that make me pull back. Okay. But when I see it happening one out of billions of times, that is what we are concerned about.

Q. Okay. I think we are ready to move to the second topic, the relative frequency of least significant digits in individual experiments. I guess can you just generally describe for us what the analysis is in this section of your report?

A. What I did in the first section is I simply lumped all of the experiments that Bishayee did and counted the total number of zeros, total number of ones, total numbers of twos, and I did the same thing with everybody else. Okay. So what I

did is I asked collectively if I look at all of Bishayee's numbers -- now, by the way, very often the bigger something is the more of a grasp you have on it, that is the law of large numbers.

Q. Okay.

A. But then I said if we do this on the individual experiment level. So that is what I am doing over here. I am saying that if I look at every experiment one by one.

Q. Just to take one step back before you go forward. I'm sorry. When you say you lumped all of Bishayee's together, does that include the Coulters and the chi --

A. No, just the Coulters.

Q. Okay.

A. In table one I lumped all of Bishayee's Coulters together.

Q. Okay.

A. If we go back to table one for a second, it may give you a clearer idea of what is going on. Bishayee came up with 472 zeros, et cetera. Off the top of my head I don't know what the number of those numbers is. I may actually have it in the report. We have roughly a thousand, say 22 hundred, 32 hundred, 42 hundred. It looks to me as if there are

about 5,000 numbers.

Q. Okay.

A. Now, if he has 5,000 numbers, I expect roughly 500 zeros, 500 ones, 500 twos. And so what I did is in calculating the Chi-squared what we did was we subtracted 472 from 500, squared the difference divided by something. Just this complicated calculation, but we are figuring out kind of a sort of average of how far everything is from 500.

Did roughly pretty much the same thing with the other NJMS **data** except that there were different total and a different fraction.

Q. Okay.

A. So here I just sort of looked at the total pick of everything he had ever done.

Now, what I then did is I then said well, you know, what about his individual experiments. If I did exactly the same thing for each experimental run, because for each experimental run I have about 30 numbers. On each experimental run -- 30 numbers, sometimes I don't have 30 numbers but generally 30 numbers. I should generally see three zeros and three -- I know sometimes I am going to see two of one, four of one, six of other. Okay. But again,

each time I have an experiment I can take the output from that experiment and I can calculate it Chi-squared for that, and that is what I did here.

Q. Okay.

A. And what I said was do I see anything interesting about individual experiments.

Q. When you say here, just for point of clarification on the record, it is the bottom of page 7?

A. Yes, this is on the chart on page 7, which is duplicated on page 15.

MR. PINCUS: Specifically figure 5 on page 7.

Q. Please continue.

A. Probability of actual last digit distribution assuming uniform. So I looked over time, and I graphed these against time. I took each experiment, I calculated the probability based upon this assumption of uniformity, and I put letters on the graph to show what the probability of that was. I put letters O to indicate that this was the probability of a result for somebody other than Bishayee. I put the letter B to show that it was the result for Bishayee himself. And on the printout on the last page of the report I printed

this in color, and what I did is I think I colored the Bishayee points red and the others blue. Nothing was intended of that except to be able to visually distinguish between them.

MR. PINCUS: Just so we are clear for the record, the figure at the last page of the report is figure nine.

A. In figure nine I just wanted that to be more readable and more legible, so that is why I put it there. But I wanted to be able to refer to it in context which is why I put the smaller version.

And what I see from that is again something of a pattern. Okay. There is -- I think that there is actually one experiment that somebody else ran where the probability is less than point 01. In other words, I can see -- I think there is one O below the line. I am not even sure. I think it is around 12-6-1999.

MR. PINCUS: Do you want to see the color version?

MR. FLYNN: I think that might be helpful.

MR. PINCUS: I am showing the witness the color version.

A. Yes, it is around 12-6-99. You see one thing. Now, a result down at the bottom line. The

bottom line is for the results which are out of the order of probability of one out of a hundred or less.

Now, things with probability one out of a hundred occur. Okay. They occur roughly once every hundred times. But if when I look at this peculiarity I see virtually every other blue letter is up here, a lot of Bishayee's letters are up here, but an extraordinary number are below that line. And so there were an extraordinary number of the individual results which said it shouldn't be happening.

Q. Just to clarify, and maybe this might just be me, nothing below this line is meant to say actually zero?

A. Nothing ever comes out to zero. First of all, nothing ever comes out to zero.

Q. Okay.

A. But remember the letters themselves are much coarser than the numbers.

Q. Okay.

A. So a lot of those numbers below the line correspond to probabilities which are less than one in a billion.

Q. Okay. I think we will move along to the

next -- Measurements That Are Close To The Average on page 8, is that the next section?

A. Yes, that is the next section. That is actually the second --

Q. I see. That was part of the first?

A. That is still part of the first. I am still looking at the terminal digits, but I am either looking at the terminal digits collectively or experiment by experiment.

Q. Fair enough. So now we are moving on to the next part of your -- the second prong of your conclusion?

A. Right.

Q. And I guess maybe we will start out with the same way we started the other ones is if you do a general description for me with what you are doing?

A. Okay. What happened is I look at these numbers, and there is something which looks a little bit weird about triads. In the colony experiments -- actually in both the colony experiments and the Coulter count measurements, you get three numbers at a time. And in the colony numbers -- and I had learned that apparently the averages in the colony numbers are somewhat important. Okay. When you

looked at the three numbers, one of the numbers was always -- in Bishayee's numbers, one of the three numbers that Bishayee produced was always very, very close to the average. Okay. You looked at the data other people produce, you know, they are all over the place.

Essentially the idea is again there is a certain amount of -- there is a certain amount of indeterminacy which enters into how the samples are collected. Okay. They are kind of reaching into -- my understanding is they are kind of reaching into some sort of medium, we can think of it as jellybeans. Okay. They are reaching into a bottle of jellybeans, they are pulling out either 50 or 100 or 200 roughly jellybeans, and they are picking out bunches of jellybeans of roughly the same size. And if I reached into a bunch of jellybeans, if you reached into a bench of jellybeans, and pulled out three bunches of roughly the same size -- let's say you are picking bunches of jellybeans in the order of say hundreds. Okay. Pick three numbers the same size. If I take the three numbers, I count the three collections you have, I would expect that if I looked at the -- well, certainly one of the three numbers is going to be the biggest. Actually there

might be a tie for the biggest. One of the three numbers is going to be the smallest, and one of the three numbers is going to be in between the other two. Okay. I would expect that there is no particular reason why the number that is between the other two is closer to the higher number or closer to the lower number or strictly in the middle. I would expect it to be someplace -- you know, just sort of randomly and uniformly. It is a funny word, but we all kind of understand it. I would expect it to be kind of uniformly in the middle. Sorry, uniformly across that middle.

Q. The spectrum from the lowest to the highest?

A. Yes. Now, how can I measure where it fits in the spectrum? One way to measure is I take the middle the number and subtract the lower number, I take the highest number and subtract the lowest number and I look at ratio of the middle minus the lower and the highest minus the lower. When we say we expect the ratio to be someplace across there, what we are saying is we expect that ratio to be something between zero and one, and we don't expect it to be more likely between zero and point one than between point four and point five or vice versa.

Okay. We expect it to be pretty much uniformly distributed. Okay.

Now, again we are starting with kind of an assumption. And there are a number of ways of addressing that assumption. One way to address that assumption is to try to give a mathematical proof that that would be the case. I can give a mathematical proof under certain fairly stringent conditions. Okay. But they are not entirely the conditions that apply here. Certainly just this reasoning is enough to give me a feeling that that should be the case. But I want to have more evidence. How can I gather more evidence? One is to look at evidence from elsewhere. I can look at what happens when I take the colony numbers from other people.

Now, one of the things I have to do is if I start dealing with extraordinarily small colony numbers like counts of seven or ten, well then seven or ten I only have a few possible results. Okay. So what I did is I did all of the groups of colony -- first of all there were some colony experiments where I didn't have three numbers. I threw those out. I then took all of the groups where I had a full set of triples. I simply said I am going to

throw out every one where the difference between the highest and the lowest is less than ten. Why? Because if it is less than ten I am not going to get a full spectrum.

Then what I did was I took out of the data that was left, all of the data from Bishayee, and I have the counts of how many triples I had there. Took all of the triples from everybody else and I did this calculation. And after I did this calculation, I looked at what the distribution of these ratios looked like. Okay. And if you look on page -- the figure on page six -- sorry. Let's look at the figure on page -- figure seven. Okay.

There were 542 triples from all of the other experimental data I had from UMDNJ and you can see that -- and what I did was I drew a histogram, which means what I did is I looked at the fraction of those triples which were between in this case I guess it looks like zero and -- each bar corresponds to a range of point zero five, one-twentieth. And slightly less than ten percent of the ratios from those 542 were between zero and point zero five. Okay. Around five percent were between zero and point zero -- point zero five and point zero one. It looks like about four percent were between point

one and point one five. Okay.

And even though this isn't precisely uniform, it shows that we have a pretty neat distribution across the spectrum of ratios. Precisely what I expected. Okay.

What I then did was I then did exactly the same thing with Bishayee's data. That is what I have in figure eight. Okay. So I calculated it for Bishayee's data, and I have this incredible anomaly right in the middle. If I look at the percentage of his triples in which the ratio is between in this case point four five and point five. More than forty percent of his triples give that.

I mean that is an extraordinary variation from what happened with everybody else where none of these intervals had more than ten percent. He has this one interval right smack in the middle which has more than forty percent.

Now, one of the questions -- I mean I had looked at other data, I had looked at this, I tried to give a mathematical derivation. As I said, in a very special case I could. The question is do I have any other reason to believe in my thing.

Well, what I did was I did a simulation. Okay. That is on page 9. Okay. What I did was I

took a rough -- I essentially told the computer give me 500 triples. Now, by the way, I have actually done this simulation a whole bunch of times and I have done it in a variety of ways, so modifying the assumptions. What I once did was to stay as close to what everybody did as possible. What I did is I wrote a simulation where I took each group's triples and I tried to randomly generate a triple which had roughly the same mean, in other words each individual triple. This isn't in the report but I did this. Because I said maybe it is in the way in which the size of his things varies. So I ran this simulation and I actually used a couple of different versions of assumptions about it, about how these are distributed. And every time I did this I got exactly the same kind of thing here.

MR. PINCUS: Here being figure six?

THE WITNESS: Here being figure six and here being figure seven.

A. It is where the ratios are uniformly spread across the spectrum. Okay. Did I see lots of ratios which were between point zero and point zero five? I see lots of them which are between point eight and one. Okay. And I don't see the vast majority sitting between point four and point

six. Okay. And so when I look at this -- and by the way, I have actually never seen this occur in the literature. Okay. This is a very interesting anomaly. But how on earth could it occur? The only way I can possibly imagine this having occurred is if somebody made up some numbers. Okay. You can't get those numbers to come out so perfectly without doing it.

Q. Like a general question, when we were referring to the first test we referred to only the right-hand digit. In this case -- hang on a second.

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

Q. When you are running this model, are you still dealing with the numbers of the least scientific significance? And what I mean is the numbers of magnitude at the front end of the three-digit number that means something to the experiment aren't going to adjust your model, do they?

MR. PINCUS: Objection to the form.

You may answer.

A. The answer is I'm not dealing with the least significant digit. I am dealing with sort of every digit within here.

Q. Okay.

A. In the sense that, one, it is a question of what the three numbers happen to look like. Okay. I actually haven't looked at the triples, but there are probably some triples which look like, you know, 486, 561, 720. Okay. There everything is significant. Okay. And what I am simply saying is if I have 486 on one end and 720 on the other end, I expect to see, you know, not only a lot of 550s but I expect to see a lot of 480s and 490s. I don't know whether I have gotten the right numbers here, but you get the general idea.

So what I was dealing with was really the whole numbers. What I was dealing with is the full gap between the numbers. I threw out everything where the gap was less than ten. So in fact I was really not dealing with the last digit, because it is only when the gap is less than ten that the only material thing is the last digit.

Q. I understand what you are saying, and I guess what I am getting at is then we are also dealing with the tenth digit, and if you can recall, do you recall many of your triples that dealt with a discrepancy as great as what you just said, a 490 to a 782, or are we dealing with much smaller

deviations?

MR. PINCUS: Object to the form.

You may answer.

A. I actually want to apologize. I have to remember -- I got to apologize for not being completely consistent with the rules. I have not been letting you ask questions.

Q. You are been doing fine.

MR. PINCUS: You have been doing fine.

A. I know I am supposed to wait until you finish. It is a little bit of a bad habit.

At the moment I cannot distinctly recall how many triples there were of various sizes. I know that there were triples certainly in the three digits in as high as four or 500. Actually I shouldn't say for sure I know. I am pretty sure. It has been a long time since I looked at them.

Q. Okay.

A. It is funny I actually -- because I was going to be doing this, I actually pulled out one data set last night, and I can't even remember exactly what the numbers were in that. Okay. I can remember roughly what the ratios were, and it was just one experiment so it was ten triples but they were all over the place. I don't think I could tell

you whether the gaps were in the hundreds or in the teens.

Q. Okay. Fair enough.

MR. PINCUS: At a point that is convenient to you I would like to take a break.

MR. FLYNN: I would like to also. I just want to finish point number two and we can take a break.

MR. PINCUS: Not a problem.

MR. FLYNN: Actually right now is a good time.

MR. PINCUS: Okay. Then let's take a break.

(Whereupon, a brief recess was taken.)

Q. I guess we will move on to the third prong of your report. If you could just do more of the same as we did with the other ones, a general description?

A. Same thing. By the way, this is in some ways, you know, at least closer in spirit to the first than the second is. This is again a consideration of digits. And the issue is again, you know, when you are dealing with fairly large numbers, the two digits, the last two digits, are again relatively insignificant. And certainly if

the last digit is pretty insignificant, it shouldn't be looking very much like the next to the last digit.

So let's look at this. Let's see if there is anything going on with this. And so what I did was I sat down and I obviously didn't hand count, I wrote a little program which would pull out the last two digits, looks to see whether they were equal, count the number of times the last two digits were equal. And here I am looking at every individual number, which was what I was doing the first time around. But not what I was doing with the middle thing. In the middle thing I am looking at groups of three numbers and looking at how they hang together.

Here I am looking at every single number that you produce. And again it seems pretty plausible that unless you are monkeying with the numbers, that you are going to have the last digit and the very last digit will be equal about a tenth of the time.

Q. When you say equal, are we saying a 22 or are we saying a 17 showing up in multiple --

A. No, what I am saying is I write down a number like 375. The last two digits are seven and

five. Okay. In this case they are not equal. If I wrote down 422 the, last two digits are equal. So now what I do is I look at all of my numbers, and roughly speaking you would sort of expect if you have a bunch of numbers, a hodgepodge of numbers, about one out of every ten times -- whenever you have a one, you know, it will be matched with a one about one-tenth of the time. Whenever you have a two, the next to the last digit of two, it would be matched with a two about one-tenth of the time.

Q. Okay.

A. So let's look to see if that is the case. So what I did was I took Bishayee's data, and one of the reasons I did this was it gives me the opportunity to look at a completely different statistical test. Okay. The statistical assumption here is that you should get -- what we have in Bishayee he did -- I have 5,155 recorded in 171 experiments using the Coulter Counter. I have 5,155 numbers. Roughly speaking I expect that of those about 515 or 516 should have the last two digits equal. So I count how many of his numbers have the last two digits equal and that is 636.

The question is, you know, could that happen? Obviously. Could it happen purely by

chance? Obviously it could happen purely by chance, just as all of the molecules can go to the corner of the room. But I can actually calculate the probability of that, assuming that the probability of a pair occurring is one-tenth. Okay. And there is a standard result and probability which says, well, if you conduct 5,155 experiments, and something is supposed to happen one-tenth of the time, here is the probability it will happen 515 times. Here is the probability it will happen 516 times. Here is the probability -- and it is an exact number we can calculate. We can calculate all of those probabilities.

So what we can do is we can calculate the probability it happens 636 times or more. Okay. So in other words, what is the probability -- another way to think about it is, you know, I have a little spinner and there is a section of the spinner which is one-tenth of the size of the spinner and I spin that spinner 5,155 times. I can ask what is the probability that the arrow points to that one-tenth section 636 times or more. That is given by something called the binomial distribution.

So I got into R and I said what is the probability of this happening with my spinner or

with his experiment if my assumption of the one-tenth is correct. And what R told me was the chance is less than one in ten million.

Q. Okay.

A. And one of the questions was again the empirical question, I have a reasonable a-priori assumption which almost everybody I think would subscribe to, but again it doesn't hurt to test it against other data. Okay. What other data do I have? Well, I have 2,759 numbers from everybody else.

Q. Okay.

A. So I counted their last digits. And again, roughly speaking what would I expect? I would expect about 275.9. Well, what did they get? They had 280. So again I can ask what is the probability of that, and the probability of that is point three eight.

Q. Okay.

A. Pretty high probability. Whereas the number I had from Bishayee was a pretty low probability.

Q. Okay. I see why you said that this is very close to maybe the first one. We were dealing with the one digit, and now we kind of added another

digit to the analysis?

A. Right, but we are also adding a different statistical technique. We are not doing what is called a Goodness-of-Fit Test. We are simply looking at the actual probability that this occurred. And I actually addressed it in two different ways. I wanted to make sure that anybody who read this would know that I looked at it from every other point of view.

What happens is the exact probabilities for this is given by something called the binomial distribution. People often approximate the binomial distribution with normal distributions. This is what everybody thinks all of probabilities are about. So what I did was I used the normal calculation to calculate the probability, and it is still very, very small.

Q. But the statistics, and correct me if I am wrong, is based after the assumption of there is the one in ten chance of the two digits occurring?

A. Yeah. The probability calculation is based on that premise.

Q. In any of the references, and I don't know that I saw one, and you can tell me if I missed it, did any of the other authors that you referenced or

the other statisticians use a similar assumption?

A. Well, in the references I have seen, in the papers I have seen on using statistical techniques and defect flaws, there are roughly two techniques which seem to be the prevalent techniques that people use. One is the last digit, and the other is something called Benford's Law to look at the first digits. First digits here aren't germane. They aren't the things you would look at, so I never tried looking at it with Benford's Law.

I was interested, number one, I thought this whole question of can I look at numbers and figure out whether somebody is faking it is an interesting question. And so I simply said are there other things I could look at. I mean having discovered this particular anomaly with the middle number of the three, you know, the question was are there any other ways to look at what is going on in this data, and although I haven't seen anybody do this, I think everybody else would make the same assumption.

The literature on this is kind of interesting in the following sense, if you read Mosimann's paper, and I have another reference in here, Marzouki, Are These Data Real. They actually

used the same terminal digits. In each case they said when we showed these tests to the malefactor, they confessed.

Well, I mean the question is what do you do in a world where somebody simply says I didn't do it? Okay. Well, what you really need to do is you really need to look a little bit more deeply. Okay. And since my premise was, one, you know, I am going to look to see whether there is a substantial case here, and that is certainly what I was hired to do. But I am going to look to do this, one, and if the data shows me that I am wrong then I am wrong. But in the case of doing this, I am going to assume that nobody is going to sit down and say yes, I did it. So I better find -- you know, look at it more thoroughly.

Q. So is it fair to say that prongs two and three were something that you created on your own, is that a fair --

A. Yes, absolutely. I am proud of that.

Q. I'm not saying you shouldn't be.

Have you ever applied similar analyses in other contexts prior to doing this report? And when I say these, I mean prongs two and three of your conclusion.

A. Not that I can think of.

Q. Okay. Did you discuss your use of those prongs with any colleagues or anyone prior to doing them or after you reached these conclusions?

A. Well, I certainly talked to people about what I was doing and that I thought this was kind of interesting stuff, yeah. Some of this is -- I am a mathematician, I get excited about thinking about things in certain ways.

Q. I get excited about Law and Order.

A. I also thought this would make a very interesting paper, which I actually want to, assuming I get Dr. Hill's permission, publish in a journal at some point.

Q. Moving to page 13 of your report. In the first full paragraph about halfway down you will see a sentence that says, In our study of Dr. Bishayee's experimental data we have found ample indications of such a failure to pay attention to the, quote, inconsequential components, close quote, of his data sets.

Could you just explain that to me?

A. Sometimes I get intoxicated with my writing. No, I love -- I happen to like that phrase.

You go back to the beginning of the paragraph. In Mosimann's article he says, A useful way to assess questioned data is to examine inconsequential components of data sets that are not directly related to the scientific conclusions of the purported experiment.

The inconsequential components are things like the last digit. That is not really critical. Now, in a certain sense the inconsequential component -- and this is really interesting here. The inconsequential component of the triads, the triples, is that there are three numbers there. Okay. The fact that there are three numbers is really not related to the conclusion. The conclusion is what the average is going to turn out to be. Okay. But it turns out that you need all three numbers. Okay.

Now, if you are really doing the experiment, you've got three numbers and you've got something which is in the middle which is going to affect what your average is. But if you are going to fake the average, then what you do is you create the average first and then put the numbers on either side to get the average you want but you don't think about the fact. So it is sort of inconsequential

how that comes about. That is your premise. And I can't see how those numbers could have come up with any other way.

So I think that on a certain level that what is inconsequential here is we really don't care about those two numbers so we are going to make sure we get the right average. In a way I guess it is a little bit of an assertion.

Q. Let's assume for the purpose of my next couple of questions that I accept all your findings and I say, okay, Dr. Bishayee, I agree with you that he fabricated data and this goes to something that we touched on very early in the deposition. Do you know what the impact of that fabricated dated had on the experiments in question?

A. Absolutely not.

Q. Have you ever performed cell counts?

A. No.

Q. Have you ever seen a Coulter Counter or used a Coulter Counter?

A. I saw a picture of a Coulter Counter.

Q. Have you ever used one?

A. No.

Q. Have you ever been in a lab and watched somebody use one?

A. No.
Q. Have you watched somebody take counts off of one?
A. No.
Q. Just being thorough.
A. Absolutely.
Q. Do you know the relevance of the data that you reviewed, its relevance to the experiment in question?
A. I'm not sure I can answer that question. In the sense that I know that this was, you know, the experiment. From what I have gathered, in a way the most important part of the experiment is the colony count, which is kind of the end. But I really don't -- I'm just looking at the numbers.
Q. Rather than saying relevance, I guess the simple way of saying it is do you know how the data fits into the grand scheme of the grant application itself?
A. No.
Q. Or the published articles?
A. No.
Q. Had you heard about the bystander effect prior to meeting Dr. Hill?
A. No.

Q. Maybe you haven't even heard about it yet?
A. Actually I know I have heard the term, but to be perfectly honest that is about all I can say about it.
Q. You don't know what it means or refers to?
A. I am just a numbers guy.
Q. Do you know what a tritiated thymidine is?
A. It is some kind of radioactive substance. Beyond that, no.
Q. Never dealt with it before?
A. No.
Q. Do you have any knowledge of its reaction to certain variables whether in the lab or outside the lab?
A. No.
Q. Okay.
A. I think I just flunked biochemistry.
Q. I flunked it a long time ago.
A. Well radiology is what I just flunked. Sorry, professor.
Q. I would like to just mark some of the references that you made for purposes of attaching to the transcript and ask you a few questions but not an exorbitant amount.
A. Okay.

MR. FLYNN: Let's mark this as Exhibit Pitt 4 please.

(Whereupon, Pitt Exhibit 4 was marked for identification by the Reporter.)

Q. I'm showing you what has been marked as Exhibit 4. It is an article by James E. Mosimann and et al., as we say, Terminal Digits and the Examination of Questioned Data. And this is one of the references that you used?

(Whereupon, the Witness looked at the aforementioned exhibit.)

A. Yes.

Q. You made an interesting point that I was actually going to raise about Mosimann and you just made it about a minute ago. You said what Dr. Mossiman did was he confronted people with his initial findings and they basically confessed. Is that true of his articles basically?

A. Yes. Well, actually one article is on fabrication, and the other article is can you generate random digits, which actually is the same thing that Campanis discusses also.

So the whole thing hangs together that people really can't fake it, and so we can find out whether they are faking. The Marzouki article is

similar in that. And basically they kind of know the people faked it is my recollection.

Q. Okay.

A. So they are working backwards from they know the data was faked and this is it.

Q. Okay.

A. And the answer is yes, I mean they did confront it. If you look at my references, I really tried to look at the issue. Okay. The Preece article very specifically says there are reasons why. So what I was interested in doing is finding out are these reasons here.

MR. FLYNN: Let's mark this as the next exhibit.

(Whereupon, Pitt Exhibit 5 was marked for identification by the Reporter.)

Q. You have been shown what has been marked as Exhibit Pitt 5? Is this the other Mosimann article you were just referring to?

(Whereupon, the Witness looked at the aforementioned exhibit.)

A. This is the other Mosimann article.

Q. Okay. I don't think I have any specific questions on it.

MR. FLYNN: Let's mark this as Pitt

Exhibit 6.

(Whereupon, Pitt Exhibit 6 was marked for identification by the Reporter.)

Q. I'm now showing you what has been marked Pitt 6, which is an article by Sanaa Al-Marzouki and et al., I don't want to totally butcher her name, entitled Are These Data Real? Statistical Methods For the Detection of Data Fabrication in Clinical Trials.

And if you look at the first page in the little abstract section, she has conclusions. Several statistical features of the data from the dietary trial are some strongly suggestive of data fabrication that no other explanation if likely.

Do you feel that your opinion in this case is stronger or less strong than the conclusion that she is reaching there?

A. I would say that it is a question of how you would determine the word likely. If I think of likely as sort of a soft, you know, I-would-be-very-surprised, I-would-be-surprised-but-not-shocked, then mine is much stronger. Okay. In other words, you know, there is always some other explanation. You can always come up with some possible explanation. All

of the particles accumulated in the corner, it happens. Okay. But I would say in this particular case to me it is much stronger than that.

Q. I wanted to get your feel for the use of strongly suggestive. Is that how you feel -- we can't use the word certainty I guess is what we have both been kind of talking about throughout the deposition. Is that a better terminology, scientific certainty as opposed to strongly suggestive?

A. There is no such thing as statistical certainty. There is incredible unlikelihood. I would say it is more than strongly suggestive. I mean to me it is highly indicative. I don't know whether highly indicative is stronger than strongly suggestive.

Q. If I could have you flip to page 269 of her article I guess. Do you see the subsection randomization process, randomization process I guess. She says there in the second sentence that one possibility is that the data themselves are genuine but the that the randomization process has been subverted.

Could you explain to me your understanding of that?

A. Okay. It has been a while since I read the article. I really actually have no idea. Okay. One, I mean if you are asking me to read this right now and sort of say what would I infer that this means, not having looked at the rest of the article for probably six months or eight months?

Q. Maybe I could clarify the question. I'm not asking specifically which subversion, specific subversion she is asking about in this article, but just the fact that how can the randomization process be subverted generally?

MR. PINCUS: Objection to the form.

You may answer.

A. First of all, she is talking about a very I believe -- and I am going to have to make a little bit of a conjecture here. She is talking about a very different kind of experiment than we are discussing. Okay. I believe she is talking about an experiment which was supposed to involve randomized trials. Which is to say that we are going to give some people some sort of medication, we are going to give other people a placebo and we are going to see what the effect is. It may be something other than that, but my guess is that when she talks about the randomization process that that

is roughly what she is talking about.

Now, how could the randomization process -- so if you are talking about that kind of thing, how could the randomization process be subverted? Well, in a randomized trial, what you are supposed to do is you are supposed to have a group of subjects who are going to be given this medication and you are -- the presumed medication, and the group to whom the placebo is given, and you are supposed to decide who gets what on a purely random basis. You subvert it if in some sense or another if I look at you and say this guy looks very healthy so what I am going to do is I am going to give him my medication and this guy looks weak and so I am going to give him the placebo and we are going to so that my medicine works.

That is an example of a possible interpretation of this. I don't know if this fits with what went on in the article.

Q. Fair enough. On the next page in the very top right-hand side under the subsection Digit Preference, I think this kind of goes back to something we spoke about earlier is digit preference in itself is not evidence of misconduct. Would you agree with that statement?

A. Actually before I agree to that statement, I want to go back to the preceding paragraph where it says had there been a tendency to put patients with let's a say higher blood pressure within one group. That is what she was talking about subverting it. So I was right on.

Q. Okay.

A. I think in this particular case I think it is -- I think this is a statement which is context dependent. I'm not exactly sure what she is saying here. But the fact is that if we look at -- she is definitely not saying that if you saw a whole bunch of numbers with this funny pattern in the last digit.

Now, there is -- it is certainly not conclusive evidence, you know, and I pointed out already that this other people says it is not conclusive evidence, but it is certainly evidence.

Q. Fair enough. Okay.

A. I should say it is definitely evidence of potential misconduct, possible misconduct. I should get away from lawyers phrases. I withdraw everything I have said.

MR. PINCUS: Well, are you truly withdrawing what you said, or were you just

making a joke?

THE WITNESS: No, I am making a joke. No, I don't withdraw what I said. Thank you for correcting me.

MR. PINCUS: No problem.

A. Can I put this article aside?

Q. Yes, absolutely.

A. Thank you.

Q. The next one is Dr. Hill, a different Dr. Hill I assume.

A. I like that paper. Dr. Hill is an interesting guy.

MR. FLYNN: Okay. This will be the next exhibit.

(Whereupon, Pitt Exhibit 7 was marked for identification by the Reporter.)

Q. I show you what has been marked Pitt 7.

(Whereupon, the Witness looked at the aforementioned exhibit.)

A. Okay.

Q. We talked about this a little earlier. You went into Benford's Law which if I am correct --

A. I think that is what this paper is about.

Q. More of the theory that he applies. And generally speaking, just simply put for us, can you

describe the differences between Benford's Law and the type of statistical analysis that you have used in your report?

A. Benford's Law is an observation about the frequency with which leading digits should occur in certain natural occurring sets of data.

What I have been doing -- and it was actually initially established pretty -- it was an empirical observation. Somebody went out and looked at a bunch of numbers and said ones occur at about three-tenths of the time and twos occur at a slightly lower fraction of the time. It is related to logarithms. Later on a mathematician named Percy Diaconis actually did a -- wrote a paper in which he said, well, I can give you a reason of why this should occur. This has nothing whatever to do with it.

Q. Fair enough. More of a general question. Is there a reason -- this is a copy of the copy that was produced by Mr. Pincus. Is there a reason that it was a manuscript rather than from a published peer review journal? I ask because I was able to locate Dr. Hill's article in a peer review journal, and I was wondering if there was any reason that you produced just this manuscript version? I am not

saying in it a conclusory way or anything. I am just asking if --

A. What happened is I found a lot of these papers on the web and I just don't remember how I -- sometimes what I will do is I will go to something like JSTOR and I will pull down the journal copy and sometimes I will get a copy someplace else.

Q. Okay. Fair enough. It is no different than the journal copy, it was just a curiosity question.

A. It is just how I got the copy.

THE WITNESS: I think I sent the copy to you, didn't I?

MR. PINCUS: That is the only reason why Scott has them, because you provided them to me at his request.

MR. FLYNN: Let's mark this next one as Pitt 8.

(Whereupon, Pitt Exhibit 8 was marked for identification by the Reporter.)

Q. I'm showing you what has been marked as Pitt 8, an article by D.A. Preece, Distributions of Final Digits in Data. I am simply going to ask if this was the Preece article that you referenced earlier and that is referenced in your report?

(Whereupon, the Witness looked at the aforementioned exhibit.)

A. Absolutely.

MR. FLYNN: This will be Pitt 9 please.

(Whereupon, Pitt Exhibit 9 was marked for identification by the Reporter.)

Q. Dr. Pitt, I am now showing you what has been marked as Pitt 9. It is an article by Rosemary N. Taylor, Statistical Techniques to Defect Fraud and Other Data Irregularities in Clinical Questionnaire Data. At the very bottom of the first page in the article there is an acceptance that begins, Fraud is perhaps the least likely explanation for data irregularities but is often the one with the most serious consequences, et cetera, et cetera.

Would you agree or disagree with that statement?

MR. PINCUS: Well, objection. No foundation.

You may answer.

(Whereupon, the Witness looked at the aforementioned exhibit.)

A. I don't know whether I agree or disagree. Actually -- honestly it is a funny -- I don't know

that it is the least likely explanation for data irregularities. It certainly is a -- it certainly is something with serious consequences.

Q. Absolutely.

A. You know, I think if you look at the Preece paper, which actually talks about this whole question of, you know, could there be reasonable explanations for certain kinds of irregularities. Okay. And basically the Preece argument is, well, there is imprecision in how you get certain numbers. That is basically the gist of his argument. Well, one, one certain context is that there is a very likely explanation. It is a possibility of if you are not reading numbers digitally then there is a good chance you are going to be wrong.

So I would certainly say within that context that fraud is probably not a very likely explanation. And those kinds of irregularities are probably inconsequential. Okay. So I think again it is a context-dependent thing.

Q. If we continue on the next page of the same paragraph there, the last sentence in that paragraph says, Of course, even if no explanation is found, establishment of a deliberate intention to defraud is another matter again, and outside of the

scope of this paper.

Would you say the similar conclusion is outside the scope of your report with respect to Dr. Bishayee?

MR. PINCUS: Objection. No foundation.

You may answer.

A. You have to ask that question again please.

Q. Okay. We have discussed and you have stated that your opinion is that it is very likely or some degree higher than very likely that Dr. Bishayee fabricated the data in question. Does that conclusion then lead to the subsequent conclusion that he also had a deliberate intention to defraud?

MR. PINCUS: Objection to the form of the question. It calls for a legal conclusion.

You may answer.

A. I actually don't think I am competent to answer that. I mean I --

Q. Fair enough.

A. I'd have to be a mind reader.

Q. If you give me like two minutes just so I can look at my notes here, but I think I might be done.

MR. PINCUS: I just have a couple of brief

questions.

(Whereupon, a brief recess was taken.)

Q. We talked about this earlier, but you did say you reviewed the ORI investigative report prior to preparing your report?

A. Not in the immediate past. Now, I reviewed this -- I think I read it at the very beginning of this whole process.

Q. Okay. But it was something you did review.

A. I think. I cannot say with absolute certainty.

Q. Okay.

A. It is hard for me to believe that I didn't. I mean I just don't know if I was -- I can't.

Q. I thank you for your time, and I think Mr. Pincus has some questions.

MR. PINCUS: I have just a couple of questions.

CROSS-EXAMINATION

BY MR. PINCUS:

Q. Mr. Flynn has taken the time here this morning to review not only your qualifications and

your experiences and your methodology with regard to preparing the report that you prepared, he has also reviewed with you the references that you cite in your report and the various techniques that you employed.

Given all of that, are you confident that as regards to each of the issues which your report discusses that the techniques and the methodology that you employed with regards to mathematics and statistics are ones which are generally acceptable in the mathematical statistical community?

A. Absolutely.

Q. Were you confident in the validity of the techniques and methodologies that you employed?

A. Yes.

Q. As with regard to the conclusions that you reach in your report, each of the individual sections or the overall conclusions, are those conclusions based on a reasonable degree of either mathematical or statistical probability?

A. Yes.

Q. And that is all I have. Thank you.

MR. FLYNN: I have nothing further. Thank for your time. It was nice meeting you.

THE WITNESS: You are welcome. It was

nice to meet you too.

MR. PINCUS: Just note that we reserve the right to read and sign.

(The deposition concluded at 1:10 p.m.)

C E R T I F I C A T E

I, ADRIAN J. FEBRE, a Shorthand Reporter and Notary Public of the State of New Jersey, do hereby certify that prior to the commencement of the examination, DR. JOEL PITT was duly sworn by me to testify the truth, the whole truth and nothing but the truth.

I DO FURTHER CERTIFY that the foregoing is a true and accurate transcript of the testimony as taken stenographically by and before me at the time, place and on the date hereinbefore set forth, to the best of my ability.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney nor counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested in this action.

Notary Public of the State of New Jersey
My commission expires June 20, 2010
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