

1
2 IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA
3 IN AND FOR THE COUNTY OF SAN FRANCISCO

4 --o0o--

5 ELIEZER WILLIAMS, a minor, by)
Sweetie Williams, his guardian ad)
6 litem, et al.,)

7 Plaintiffs,)

8 vs.) No. 312236

9 STATE OF CALIFORNIA; DELAINE)
EASTIN, State Superintendent of)
10 Public Instruction; STATE)
DEPARTMENT OF EDUCATION; STATE)
11 BOARD OF EDUCATION,)

12 Defendants.)

13
14
15 DEPOSITION OF
16 DR. GLEN EARTHMAN

17
18 Volume I
19 (Pages 1 through 152)
20 January 13, 2003

21
22 REPORTED BY: JOHNNA PIPER CSR 11268 JOB 3-327513
23
24
25

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 Defendants.)

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BE IT REMEMBERED that, pursuant to notice and on Monday, January 13, 2003, commencing at 9:33 a.m. at O'Melveny & Myers LLP, 275 Battery Street, San Francisco, California, before me, JOHNNA PIPER, a Certified Shorthand Reporter, personally appeared
 DR. GLEN EARTHMAN

called as a witness by the Defendant state of California, who, having been first duly sworn, was examined and testified as follows:

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8	Review of Research on the relationship between school buildings, student achievement, and student behavior, dated October 8, 1996, Bates stamped PLTF-XP-GE 0623 through PLTF-XP-GE 0638.....	139
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STATE OF CALIFORNIA, DEPARTMENT OF JUSTICE,
 OFFICE OF THE ATTORNEY GENERAL HEW, 1300 I Street,
 Sacramento, California 95814, represented by SUZANNE
 GIORGI, Attorney at Law, appeared as counsel on behalf
 of the Defendant, State of California.

OLSON, HAGEL & FISHBURN LLP, Plaza Towers,
 555 Capitol Mall, Suite 1425, Sacramento, California
 95814-4602, represented by N. EUGENE HILL, Attorney at
 Law, appeared as counsel on behalf of the Defendant,
 California School Board Association.

ACLU FOUNDATION OF SOUTHERN CALIFORNIA, 1616
 Beverly Boulevard, Los Angeles, California 90026-5752,
 represented by PETER ELIASBERG, Attorney at Law,
 appeared as counsel on behalf of the Plaintiffs.

MORRISON & FOERSTER LLP, 555 West Fifth
 Street, Los Angeles, California 90013-1024,
 represented by BITA RAHEBI, Attorney at Law, appeared
 as counsel on behalf of the Plaintiffs.

PILLSBURY WINTHROP LLP, 50 Fremont Street,
 San Francisco, California 94105-2228, represented by
 CAROLINE N. MITCHELL and KRISTIN M. LEFEVRE, Attorneys
 at Law, appeared as counsel on behalf of the
 Defendants, Los Angeles Unified School District.

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EXAMINATION BY MS. GIORGI

- 1 MS. GIORGI: Q. Dr. Earthman, could you
2 please state your name for the record?
3 A. Glen Earthman.
4 Q. And could you spell it, please?
5 A. E-a-r-t-h-m-a-n.
6 Q. Have you ever had your deposition taken
7 before?
8 A. No.
9 Q. So you've never had your deposition taken
10 before?
11 A. No.
12 Q. Has Mr. Eliasberg explained to you the
13 procedures in a deposition?
14 A. Yes, he has.
15 Q. Okay.
16 So there is no misunderstanding, I'll go
17 over a little bit of the ground rules.
18 A. Please.
19 Q. A deposition is the taking of testimony
20 under oath in connection to a court action. In this
21 case, it is the Williams' case and you're familiar with
22 the Williams' case, correct?
23 A. Yes.
24 Q. Although we're in an informal setting, your
25

- 1 testimony is being taken under penalty of perjury as if
2 we were in a courtroom. You understand that?
3 A. Yes.
4 Q. The court reporter is transcribing the words
5 that we say and at the conclusion of this deposition,
6 you'll be getting a transcript which you'll have the
7 opportunity to read and review and it will be your
8 testimony in this matter. Do you understand that?
9 A. Yes.
10 Q. You'll have the opportunity to make
11 corrections and changes on that transcript. However,
12 if this matter does go to trial, I or any of the other
13 counsels will have opportunity to comment on any
14 substantive changes you make to the deposition and that
15 could impact your credibility. Do you understand that?
16 A. Right.
17 Q. Therefore, it is very important that you
18 give me full and complete answers to our questions.
19 Will you do that?
20 A. I certainly will.
21 Q. You have the right to clear, understandable
22 questions. If you don't understand a question that I'm
23 asking, please let me know. Will you do that?
24 A. I will.
25 Q. That will allow me to make changes to the

- 1 question. If I ask you a question and then you answer
2 it and you don't ask for any clarification, I'm going
3 to assume that you understood the question that I
4 asked. Do you understand that?
5 A. Yes.
6 Q. If I ask you a question and you may not have
7 the exact information I'm asking, but you have some
8 information like an approximation, such as if I were to
9 ask you how many people are in this room right now,
10 short of doing a nose count, you probably don't know
11 the exact number, but you do have some information to
12 give me an estimate. If you have some information,
13 will you provide that to me?
14 A. Yes.
15 Q. On the other hand, if I ask you a question
16 and you have no information at all, I don't want you to
17 guess. And if you think you might be guessing, tell me
18 and just tell me you don't have any information, then
19 we'll be clear.
20 A. Yes.
21 Q. Okay. A few mechanical things. The court
22 reporter can only transcribe one person speaking at a
23 time. So when I finish speaking, then would you give
24 your answer?
25 A. Yes.

- 1 Q. Also, if one of the attorneys makes an
2 objection, please wait and let them finish their
3 objection before you continue speaking.
4 Also, the court reporter cannot take down
5 nonverbal responses, so a nodding would not be
6 appropriate. We would need something verbal for the
7 record. Okay?
8 A. I understand.
9 Q. Is there any reason you cannot give us
10 truthful, accurate testimony today? Medical condition?
11 Medications? Anything at all?
12 A. No.
13 Q. Okay. We should be taking periodic breaks,
14 so if you need a break, let us know. We'll try to
15 accommodate you.
16 And do you have any other questions for me?
17 A. No, I don't believe so.
18 Q. Okay. We'll start. One of the first things
19 I'm going to do is read part of a report and see if you
20 recognize this.
21 "In recent years, there have been some
22 research studies completed that have shown a promising
23 avenue of investigation. These studies have
24 demonstrated a positive relationship between student
25 achievement and behavior and the design and condition

1 of school buildings. There have not been sufficient
 2 number of such studies, however, to present a strong
 3 relationship from which generalizations can be made.
 4 Do you recall that statement, making that?
 5 A. Yes.
 6 Q. Was that your opinion back in 1998?
 7 A. Yes.
 8 Q. I think it came from the impact of school
 9 building conditions student achievement behavior paper?
 10 A. Right.
 11 Q. Is this your opinion now?
 12 A. My opinion is that we have sufficient
 13 research evidence to allow me to draw a conclusion that
 14 school buildings have an important effect upon student
 15 learning. I think some of the statements that have
 16 been made have to be taken within the context of the
 17 time frame and the purpose of the statement.
 18 Q. Are you relying on any new studies
 19 subsequent to 1998 for the change of your opinion?
 20 MR. ELIASBERG: Objection. Misstates the
 21 witness's testimony.
 22 THE WITNESS: I didn't hear that.
 23 MR. ELIASBERG: Objection. Misstates the
 24 witness's testimony.
 25 MS. GIORGI: Q. Are you relying on any new

1 studies subsequent to 1998 for your opinion that there
 2 are sufficient research studies?
 3 A. No, I'm not.
 4 Q. Are you today saying that there is a strong
 5 relationship from which generalizations can be made?
 6 A. Yes.
 7 MR. ELIASBERG: Objection. Vague and
 8 ambiguous. Generalizations as to what?
 9 THE WITNESS: I would say that there have
 10 been some studies, recent studies that have confirmed
 11 what has been presented previously. There has been a
 12 long and profitable line of research for the past
 13 decade that has demonstrated this relationship. I
 14 think there are some recent studies that have even
 15 provided better confirmation or more confirmation.
 16 MS. GIORGI: Q. Is the report by Patti
 17 Ayers one of those reports? I should say the study by
 18 Patti Ayers is one of those studies that you are
 19 relying on?
 20 A. Yes, it is.
 21 Q. And what about Ms. Ayers' report do you rely
 22 upon?
 23 A. She found some significant relationships.
 24 Q. How did she find significant relationships?
 25 A. Her study, it was a companion study with the

1 Anderson study. It had developed an instrument to
 2 measure, I think 38 design elements to see the effect
 3 they had upon student achievement, if my memory serves
 4 me correctly. I think there were 38 and there were 27
 5 significant relationships.
 6 Q. Are you aware that we've been seeking Ms.
 7 Ayers' report and have not found a copy of it?
 8 A. I'm not knowledgeable about that, no.
 9 Q. So no one has asked you to try to find Ms.
 10 Ayers' report for us?
 11 A. Mr. Eliasberg asked for a copy.
 12 Q. When was that?
 13 A. That has been several weeks ago.
 14 Q. And you personally did not have a copy?
 15 A. No.
 16 Q. Do you know where we could find one?
 17 A. At the University of Georgia library.
 18 MR. ELIASBERG: Just for clarification,
 19 we've made a request. Some dissertations are much more
 20 difficult to find than others we have. Through the
 21 Morrison & Foerster library we've been trying to obtain
 22 it. We so far have not gotten it but we've been trying
 23 to get it. We've been for a while trying to get it.
 24 MS. GIORGI: It is our position this
 25 deposition cannot be concluded until after we have

1 received that report and had opportunity to review it
 2 and then we'll, if need be, resume this deposition. Do
 3 all parties concur?
 4 MR. ELIASBERG: We understand that that is
 5 your position. We don't concur that is necessarily the
 6 basis given the number of reports, given the fact we
 7 have produced all of them and we've tried to produce
 8 that one but we understand that is your position for
 9 the record.
 10 MR. HILL: My name is Eugene Hill and I
 11 represent the California School Board Association and
 12 it is our position as well.
 13 MR. ELIASBERG: No, we understand. The
 14 position that Mr. Hill and the state are taking, we
 15 don't concur that that is necessarily correct that the
 16 deposition need remain open. We understand they've
 17 registered their opinion for the record.
 18 MS. GIORGI: Okay.
 19 Q. Also, Dr. Earthman, you did some original
 20 research from North Dakota?
 21 A. Yes.
 22 Q. And do you have a copy of that report with
 23 you?
 24 A. With me?
 25 Q. Uh-huh.

1 A. No.
 2 Q. Do you have a copy available?
 3 A. A copy is available through the Journal of
 4 School Business Management.
 5 MS. GIORGI: And Counsel, did you also
 6 request a copy for us to be produced?
 7 MR. ELIASBERG: We produced the article that
 8 Dr. Earthman relied on.
 9 MS. GIORGI: No, I'm asking about his
 10 report, his original research from North Dakota.
 11 MR. ELIASBERG: My understanding is that the
 12 report that he cited and the article that he cited is
 13 one that we produced for you and what he relied on was
 14 a summary of that research and we produced that
 15 article. I have a box of all the materials that we
 16 produced to you and that article is among them.
 17 MS. GIORGI: Specifically I'm looking for
 18 the article that is dated June '96, Student Achievement
 19 and Behavior School Building Condition, Journal of
 20 Business Management, Volume VIII, No. 3.
 21 MR. ELIASBERG: Yeah, I've seen that
 22 article. I've looked at it and it is in the materials.
 23 I have a box of all the materials we produced and it is
 24 in there.
 25 MS. GIORGI: At a break, could you show me

1 THE WITNESS: Yes.
 2 MS. GIORGI: Q. Okay. And then the studies
 3 in your expert report also refer to these building
 4 conditions as independent studies?
 5 A. Yes.
 6 Q. Or independent variables?
 7 MR. ELIASBERG: Objection. Misstates
 8 testimony.
 9 I'm sorry. Move to strike that objection.
 10 MS. GIORGI: Q. What other independent
 11 variables influence student achievement other than
 12 building conditions?
 13 A. The influences on student learning consist
 14 of, first of all, the family and the bringing up of the
 15 student, what we call the SES, the socioeconomic status
 16 of the child, the family. Then there are those that
 17 are outside of the family such as the school and then
 18 there could be components of that such as the building,
 19 teachers, curriculum.
 20 Q. Would the home environment be one of these
 21 variables?
 22 A. Yes. Yes.
 23 Q. The parents' genetic makeup?
 24 A. Absolutely.
 25 Q. The natural surroundings and conditions of

1 the Bates stamp? I've not been able to find it and the
 2 correspondence from your office implies that they did
 3 not produce to us.
 4 MR. ELIASBERG: Okay. I'll take a look.
 5 MS. GIORGI: Again, the absence of this
 6 report I believe is significant and warrants the non
 7 conclusion of this deposition.
 8 Q. I don't know what to call this, so I'm
 9 asking you, what is the term that you use for variables
 10 which affect dependent variables?
 11 A. I'm sorry. I didn't hear that.
 12 Q. Variables that will impact or affect the
 13 dependent variable. I think sometimes I've heard them
 14 called confounding variables. Sometimes they are
 15 intercorrelated variables. What word would you use?
 16 A. I would say there are two main variables:
 17 An independent variable and a dependent variable. And,
 18 of course, the dependent variables are influenced by
 19 the independent variable.
 20 Q. In your studies, you have looked at building
 21 conditions -- a variety of building conditions as
 22 independent variables, correct?
 23 A. Yes.
 24 MR. ELIASBERG: Objection. Vague as to
 25 "Your studies." You can answer.

1 the child's environment?
 2 A. Yes.
 3 Q. Parental involvement in the school?
 4 A. Yes.
 5 Q. Two-parent family?
 6 A. Yes.
 7 Q. Again, all of these are independent
 8 variables that impact student achievement?
 9 A. Yes.
 10 Q. Again, does the fact that a child may be an
 11 English language learner impact the child's student
 12 achievement?
 13 A. Yes, but it wouldn't necessarily be used as
 14 an independent variable.
 15 Q. And why is that?
 16 A. It could in certain studies if you are
 17 trying to find specifically the influence that that has
 18 on a child.
 19 Q. Could you explain that a little bit more? I
 20 didn't understand. The influence on the child?
 21 A. The child's performance.
 22 Q. Does a mobility rate of a child's family
 23 such as they move around, does that have an influence
 24 on a child's student performance?
 25 A. Yes.

1 Q. Does the ethnic diversity of the environment
2 of the school have an impact on the student's
3 achievement?

4 A. Yes.

5 Q. Does the family's income have an influence
6 on a student's achievement?

7 A. Yes.

8 Q. And is that what you meant when you said
9 socioeconomic status?

10 A. Yes.

11 Q. Does the education level of the child's
12 parents influence a child's academic achievement
13 success in the school?

14 A. Yes.

15 Q. And then I believe there are also some
16 independent variables that would be called school
17 related?

18 A. Yes.

19 Q. Such as the years the teacher had been
20 teaching?

21 A. Yes.

22 Q. The verbal ability of the teacher, does that
23 have an influence on the child's academic abilities or
24 academic success?

25 MR. ELIASBERG: Objection. Lacks

1 child's academic performance?

2 MR. ELIASBERG: Objection. Lacks
3 foundation.

4 MS. GIORGI: Q. Do you have an opinion on
5 that subject?

6 A. That is a very hazy area. I know there are
7 some writings on that, but I -- I might have a personal
8 opinion.

9 Q. Of all the independent variables that we've
10 gone through, if you can recall, is there a strong
11 relationship between student achievement and any of
12 these independent variables we just mentioned?

13 MR. ELIASBERG: Objection. Vague and
14 ambiguous as to "Strong."

15 MS. GIORGI: Q. Did you understand the
16 terminology "Strong relationship"?

17 A. I wouldn't say that -- I wouldn't call all
18 of these independent variables. They are variables
19 that influence a student's performance.

20 Q. Are there any of these variables that you
21 believe have a strong influence on the student's
22 performance?

23 MR. ELIASBERG: Objection. Vague and
24 ambiguous as to "Strong."

25 THE WITNESS: That is kind of difficult to

1 foundation.

2 THE WITNESS: I wouldn't really be able to
3 answer that.

4 MS. GIORGI: Q. Okay. Do you have an
5 opinion whether or not a teacher's certification has an
6 impact on a child's academic success?

7 A. No, really not.

8 Q. Do you have an opinion as to whether the
9 class size has an impact on the student's academic
10 success?

11 A. Class size can have an effect.

12 Q. You said an effect. Would you call it a
13 significant effect, a relationship?

14 A. Just an effect. Might affect.

15 Q. Do you have an opinion whether or not books
16 in the library would have an impact upon the child's
17 academic performance?

18 A. No.

19 Q. You have no opinion?

20 A. I have an opinion, yes.

21 Q. Your opinion the books in the library have
22 no impact?

23 A. They might have.

24 Q. Do you have an opinion whether or not the
25 per-pupil expenditure on a child would impact the

1 say. There are some influences recognizable by almost
2 everyone.

3 MS. GIORGI: Q. You stated back in your
4 1998 report, "When one realizes the many variables that
5 influence how much students can and do learn and how
6 students behave, it is evident the built environment
7 perhaps has a very limited role to play."

8 Do you recall that statement?

9 A. Yes.

10 Q. Was that your opinion back in 1998?

11 A. It was written as a -- as a cautionary
12 measure because I think later on, I say, but what we
13 have been able to find is very important taken with all
14 of the variables that influence a student's learning,
15 most of which we cannot really identify. When you can
16 identify an influence, then it becomes very important.

17 Q. So how does a researcher, in doing their
18 analysis, control for all of these variables in testing
19 the hypotheses that building conditions impact student
20 achievement?

21 A. Many of the variables that you listed there
22 are summed up in the poverty or wealth of a youngster.
23 And in most research projects, the researcher uses a
24 measure of control to eliminate the effect that
25 variable has.

1 Q. They eliminate the impact?
 2 A. They try and control it.
 3 Q. They control the impact?
 4 A. Uh-huh.
 5 Q. How is that done?
 6 A. In the case of most of the studies that have
 7 been listed in the report, the researcher uses the
 8 percentage of students in a free and reduced lunch
 9 program of the school system and that percentage is
 10 then a factor to at least control for all of the
 11 variables that the student's background can bring.
 12 Q. Would this controlling of the child's
 13 background, the free lunch, is that a control for
 14 poverty?
 15 A. Yes.
 16 Q. And you say that it can also control for
 17 maybe the home environment?
 18 A. It is used.
 19 Q. And it can control for a two-parent family?
 20 A. Not specifically.
 21 Q. Can it control for the migration rate?
 22 A. No, not to that.
 23 Q. And does it control for the educational
 24 level of the parents?
 25 A. No.

1 Q. And it doesn't control for the parents'
 2 genes, correct?
 3 A. No.
 4 Q. Does it control for the language used in the
 5 home?
 6 A. It could in a very obtuse way.
 7 Q. Could you explain probably mathematically
 8 how this free lunch factor controls in the analysis of
 9 the data?
 10 MR. ELIASBERG: Objection. Vague.
 11 THE WITNESS: I didn't hear you.
 12 MR. ELIASBERG: Objection. Vague.
 13 MS. GIORGI: Q. Do you understand the
 14 question?
 15 A. Could you repeat it, please?
 16 Q. How does the child's free lunch rate
 17 mathematically or essentially how does the mathematical
 18 aspect of the researcher's control -- that doesn't make
 19 sense either -- strike that.
 20 How does the researcher mathematically
 21 control for the child's economic status or the child's
 22 family's economic status?
 23 A. The researcher uses the percentage of
 24 students in the school as a factor as one of the
 25 variables that that is entered into the regression

1 analysis.
 2 Q. Can you explain to me how regression
 3 analysis works?
 4 A. I can give you a very elementary. I'm not a
 5 statistician. On all of the research projects that
 6 I've been involved in, whether it is doctoral students
 7 or my own, I've relied upon the expertise of a
 8 statistician to ensure that the type of statistical
 9 analysis used is correct and that the analysis results
 10 are then correctly interpreted, but according to my
 11 understanding, all of -- there is a factor or there is
 12 a numerical factor for all the variables, whether it is
 13 a percentage, whether it is an achievement score or a
 14 building assessment score, all of these are entered
 15 into the formula to find out how much weight one
 16 carries against another and regression analysis
 17 provides that.
 18 Q. Could you explain to me what you mean by
 19 "Weight"?
 20 A. The formula takes into consideration these
 21 various indices, various factors or numbers, and sorts
 22 them out so that one has more weighting than the other.
 23 In almost all cases, it is the SES that has the most
 24 weight. That explains the most variables.
 25 Q. What do you mean by "Explains the most

1 variance"?
 2 A. Of the -- whatever the variance is that --
 3 whatever enters into a child's learning, we know the
 4 family background covers a great deal and if that --
 5 you could put this into a hypothetical pie, you might
 6 say that half of the pie is devoted to parental
 7 influence or even more of the pie, so it is a
 8 percentage of that theoretical pie that is divided up
 9 among the variables.
 10 Q. And how does the statistician know how much
 11 of the pie to attribute to each one of these factors?
 12 A. This is done through a formula.
 13 Q. Do you know what kind of formula?
 14 A. A computer program does it, a statistical
 15 package for social science.
 16 Q. Does the computer identify the reliability
 17 of this -- well, let me back up.
 18 When you say something like SES -- is that
 19 right, SES?
 20 A. Right; yes.
 21 Q. -- explains the most variance, are we
 22 talking about a relationship? The two factors show up
 23 in a similar amount of time?
 24 MR. ELIASBERG: Objection. I didn't mean to
 25 cut you off.

1 MS. GIORGI: Q. I'm having trouble
2 understanding how the computer program allocates and
3 decides what the variance is.

4 MR. ELIASBERG: I don't think there is a
5 question pending.

6 THE WITNESS: Yeah.

7 MS. GIORGI: Q. Can you explain that?

8 MR. ELIASBERG: Objection. Vague.

9 MS. GIORGI: Q. Does this computer program,
10 after it -- I'll have to come back to this. I just
11 don't know how to phrase a question.

12 The Plaintiffs had asked you to prepare a
13 report for this case; is that correct?

14 A. Yes; right.

15 MS. GIORGI: What I would like to do is show
16 that to you. I would like to have this marked as, I
17 think, Exhibit 1.

18
19 (Whereupon, Defendants' Exhibit 1 was marked
20 for identification.)

21 MS. GIORGI: Q. Is this your amended
22 report?

23 A. Yes, it is.

24 Q. The Plaintiffs asked you to provide an
25 opinion as to whether the conditions of the school

1 A. Or the references.

2 Q. So when I asked you what body of research
3 are you referring to, are you going to refer to that
4 reference list?

5 A. Yes, all of the --

6 Q. All of them in there?

7 A. Yes.

8 Q. Were there any others than the ones you list
9 in your bibliography that you would rely on in making
10 this statement?

11 A. If I were to write the report today, yes,
12 there would be some -- some others.

13 Q. Could you identify them?

14 A. One that I would most certainly include was
15 just completed this past June by Mark Schneider in
16 Washington D.C. and Chicago.

17 Q. Do you know if that was published, that
18 study was published?

19 A. Yes.

20 Q. And do you know where?

21 A. It is available through the National
22 Clearinghouse on Educational Facilities.

23 Q. Do you know what the title of this document
24 is?

25 A. Effective School Facilities on Students and

1 facilities had an effect on student academic
2 achievement; is that correct?

3 A. Yes.

4 Q. Were you asked to give an opinion about
5 California students' academic achievement and the
6 relationship with the conditions in the school
7 facilities?

8 A. No.

9 Q. Do you have an opinion regarding
10 California's conditions of school facilities and the
11 effect on student academic achievement?

12 A. No, I don't.

13 Q. You stated in your report, I believe it was
14 paragraph 32, There is a formidable body of research
15 finds that demonstrates that conditions of school
16 buildings has a sizable and measurable influence on the
17 achievement of students.

18 Does that sound correct?

19 A. Yes.

20 Q. What body of research are you referring to?

21 And before I make you guess, in the back,
22 attached to your report, is a list of all the studies
23 you identified in the report in your report.

24 A. You mean the bibliography?

25 Q. That is right.

1 Teachers.

2 MR. ELIASBERG: Suzanne, this was a report
3 that Dr. Earthman didn't rely on. He has since told me
4 about it. Just to make it easier, we have a copy. We
5 only brought one copy. If there is someone here who
6 could make copies, we would be happy to provide them.
7 He didn't cite it here. He wasn't aware of them at the
8 time he wrote the report, so I have copies of this so
9 you don't have to go on line and dig it up, which is
10 what I had to do.

11 MS. GIORGI: Pardon?

12 THE WITNESS: I was going to say this report
13 I found through the website of schoolfacilities.com, so
14 he has -- well, there is one research study and then a
15 report, so there are two reports by Dr. Schneider.

16 MS. GIORGI: Okay. What I'll do is save
17 that for later.

18 Q. Are there any other studies?

19 A. In retrospect, Loraine Maxwell in Syracuse
20 did two studies and in both cases, she came out showing
21 statistical positive relationship between facilities
22 and student achievement.

23 Q. And do you know when these studies were
24 done?

25 A. I could make a guess on the dates. That is

1 all I could do. I would assume -- I think it is
2 somewhere around 1998, '99. It is my guess.

3 Q. And you said her studies show a statistical
4 positive relationship?

5 A. Relationship between students' achievement.

6 Q. What does that mean?

7 A. It means that the difference between the
8 scores on students in poor buildings was different,
9 mathematically different than those in good schools.

10 Q. And when you say, "Scores," you are talking
11 about?

12 A. Achievement scores.

13 Q. Would these be --

14 MR. ELIASBERG: Just not to -- so there is
15 no problem, I think you may have cut Suzanne off and
16 that is going to make it hard for the court reporter,
17 so just wait until the question is finished before you
18 answer.

19 MS. GIORGI: Q. When you said, "Achievement
20 scores," you are talking about statewide exams --

21 A. Yes.

22 Q. -- possibly?

23 A. Yes.

24 Q. And when you said, "Poor buildings," what
25 did you mean by that?

1 MR. ELIASBERG: Okay.

2 THE WITNESS: There is one other that I --
3 that does that. Morgan Lewis did a study.

4 MS. GIORGI: Q. Do you know about when?

5 A. I think it was about two years ago, three
6 years ago.

7 Q. Approximately 2000?

8 A. Yes.

9 Q. 1999?

10 A. Yes.

11 Q. Do you know what that study was called, if
12 he did a report?

13 A. The -- he did a study in Milwaukee, the 139
14 buildings in Milwaukee, and it was something to the
15 effect that -- I can't really recall the exact name.

16 Q. Do you recall if it was a random study?

17 A. No.

18 MR. ELIASBERG: Objection. Vague as to
19 "Random."

20 MS. GIORGI: Q. Do you know whether or not
21 the data he generated was randomly selected or created?

22 A. It was not randomly chosen because he used
23 the entire population, so there would be no randomness
24 to it.

25 Q. And the entire population was of what, the

1 A. Buildings that were appraised and older
2 buildings. In one study, she looked at 21 schools in
3 Syracuse that had been renovated and compared the
4 scores of those students that had been in -- that are
5 in modernized renovated buildings with those that were
6 not in renovated buildings.

7 Q. And the result of her comparison of the
8 older buildings to the renovated buildings, there was a
9 difference?

10 A. Yes.

11 Q. In the children's test scores?

12 A. Yes.

13 Q. And that difference was a positive
14 relationship?

15 A. The students in the renovated school scored
16 higher than those in nonrenovated buildings.

17 Q. Do you know if this was a random study?

18 A. No. It was not a random study.

19 Q. Okay. Do you know of any other studies or
20 body of research that you believe demonstrates sizable
21 and measurable influence?

22 MR. ELIASBERG: By that do you mean beyond
23 what is in his bibliography and the two or three he has
24 just talked about?

25 MS. GIORGI: Right.

1 Milwaukee --

2 A. Milwaukee public schools.

3 Q. Milwaukee is a city, correct?

4 A. City, right.

5 Q. Do you recall what his findings were?
6 Morgan, correct?

7 A. Lewis is his name, Morgan Lewis. He found
8 that the reading scores in buildings that were in
9 better condition were higher than the reading scores of
10 students in poor buildings.

11 Q. And, again, when we talk about scores, you
12 are talking about --

13 A. Achievement scores, standardized achievement
14 scores.

15 Q. Do you know if it was a city standardized
16 test or a statewide test?

17 A. I think it was the Iowa test of basic
18 skills.

19 Q. And when you identified poor buildings,
20 again, what did you mean by that term?

21 A. His category of buildings that were not in
22 as good of condition as their good buildings.

23 Q. And he used good and poor or --

24 A. He used better terminology.

25 Q. Okay. How did he assess the buildings, do

1 you recall?

2 A. The city of or the school system of
3 Milwaukee had a commercial firm appraise the buildings
4 for maintenance purposes.

5 Q. And he used that appraisal as the data for
6 his study?

7 A. Yes; right.

8 Q. Okay. Are there any other studies that you
9 rely upon other than those in the bibliography and what
10 you've given to me now?

11 MR. ELIASBERG: Just so we're clear, I want
12 to make sure the question of reliance when he wrote his
13 report versus reliance on his opinion as he sits here
14 today because I don't want there to be confusion about
15 it because he didn't cite the Lewis study in his
16 report, but you are asking about what his opinions are
17 based on today.

18 THE WITNESS: I didn't rely upon them. I
19 did read them. I relied on what I included in the
20 references, reference section.

21 MS. GIORGI: Q. From all of the studies
22 that you reviewed, do you recall any of them being
23 based out of California? Again, we're talking about a
24 study that demonstrates the conditions of the school
25 buildings as a sizable measurable influence on the

1 completed for her graduate work.

2 Q. Okay. And did you have a role in this, in
3 her creation of this document?

4 A. I directed the study.

5 Q. And what do you mean by "Directed the
6 study"?

7 A. Through the process of helping a student
8 identify a topic that this is a need that needs to be
9 investigated, then she is required to make some
10 proposals as to how to do this and I oversee this. I
11 advise her on it. Give her suggestions as to what to
12 include and what not necessarily to include and to
13 advise her on the conclusions that she may come out
14 with the study.

15 Q. And what is the purpose of this document?

16 A. This --

17 MR. ELIASBERG: Objection. Vague as to
18 "Purpose."

19 THE WITNESS: Of course, the purpose is for
20 Linda to achieve her doctorate.

21 MS. GIORGI: Q. Have there been any
22 subsequent documents -- let me back up.

23 What was the scope of her paper?

24 A. Linda reviewed and analyzed and synthesized
25 research from 1982 to 1997 and limited specifically to

1 achievement of students that was based on California
2 students.

3 A. To my knowledge, no such studies have been
4 done in California.

5 MS. GIORGI: One of the reports that you
6 cite is Lemasters and I want to give that to you.
7 Could I have this marked as Exhibit 2.

8
9 (Whereupon, Defendants' Exhibit 2 was marked
10 for identification.)

11 MS. GIORGI: Q. Do you recognize this
12 document, Dr. Earthman?

13 A. Yes, I do.

14 Q. And what is --

15 MR. HILL: Excuse me. What is the exhibit
16 number for this?

17 MS. GIORGI: Exhibit 2.

18 MR. ELIASBERG: So we don't get any
19 confusion, let's make sure we call them Earthman 2. In
20 other depositions, I've seen them refer to exhibits
21 from other depositions. Just so there is no confusion,
22 let's call it Earthman Exhibit 2.

23 MS. GIORGI: Q. Okay. Looking at Earthman
24 Exhibit 2, can you tell me what this document is?

25 A. It is a dissertation that Linda Lemasters

1 those studies that dealt mainly with school building
2 condition, student achievement, and student behavior.

3 Q. Are you aware of any other similar papers --
4 I should say any other papers with similar scope
5 subsequent to her publication?

6 A. I am, yes.

7 Q. And could you tell me what -- tell me the
8 name of that document.

9 A. The name of the document is "Review of
10 Research on the Relationship Between Building Condition
11 and Student Achievement and Behavior." This document
12 was prepared for the Council on Educational Facility
13 Planners International as a review of research to
14 enable them to mount a program called, "Where Children
15 Learn."

16 Q. Do you know when that review was made
17 available?

18 A. If my memory serves me correctly, it would
19 be '98.

20 Q. And do you know who was the author of that
21 review?

22 A. I was.

23 Q. Are there any other papers that you are
24 aware of that summarize the research in this field
25 subsequent to May of 1997 since she issued her paper?

1 A. Dr. Lamasters and I have worked on another
2 paper. It is a synthesis of these studies and putting
3 them into publishable form with the intent to publish
4 them.

5 Q. This synthesis, are you currently working on
6 it?

7 A. Yes.

8 Q. Do you have an expected date of publishing
9 this synthesis?

10 A. Unfortunately, no.

11 MR. ELIASBERG: Suzanne, we've been going
12 for about an hour, so when there is a natural breaking
13 point any point in the near future --

14 MS. GIORGI: This is fine, if you would like
15 a break.

16 (Recess taken.)

17 MR. ELIASBERG: I just want to make clear
18 something because I misspoke before. We didn't
19 actually produce the Journal of Business Management
20 article, but our agreement was that anything that was
21 publicly available, we didn't have to produce it. I
22 talked to the person who did our production. He said
23 he found that article after a two-minute Google search.
24 We have copies. We can bring them over after lunch.
25 We were not required to produce it. It was publicly

1 Q. Are you aware of any other studies other
2 than, I believe it was a 1981 study by the Department
3 of Health Services, are you aware of any other studies?

4 A. No.

5 Q. Going back to Exhibit 2, the author had
6 created a table, I believe it is table three, and it is
7 on page 204 of her document. Do you recall ever seeing
8 this table before?

9 A. Yes.

10 Q. And your understanding, on the far left-hand
11 column, it identifies studies that have been done as
12 well as by author and potentially year in which the
13 study was done, correct?

14 A. Uh-huh; yes.

15 Q. I would like to go through that column of
16 studies and see if you are familiar with them. The
17 first one, I believe, is Ahrentzen?

18 A. Ahrentzen.

19 Q. You did not rely on that study?

20 A. No, I did not.

21 Q. And why did you not rely on this study?

22 A. My recollection of the study is that it
23 dealt with behaviors and with non-achievement
24 variables.

25 Q. And what do you mean by, "Non-achievement

1 available and easily obtainable. Right after lunch,
2 we'll have copies of the article for you.

3 MS. GIORGI: I would appreciate that. Still
4 won't give us an opportunity to review it before we
5 conclude this deposition.

6 MR. ELIASBERG: It is a two-day deposition,
7 so you would have an opportunity to review it tonight.
8 It is a ten-page article.

9 MS. GIORGI: All of his research? The data
10 summaries and attachments?

11 MR. ELIASBERG: No, it's the article -- it
12 is a summary of his methodology and -- but that is what
13 he relied on in writing this report.

14 THE WITNESS: Could I say one thing? On one
15 of the questions that you asked me, I probably answered
16 prematurely or not completely correctly. I took your
17 question to mean on the studies dealing with condition
18 of building and student achievement, were any done in
19 California and my answer was no. However, there is a
20 study in the report that I submitted done in California
21 by the State Department.

22 MS. GIORGI: Q. And the study you are
23 referring to is the one done by Department of Health
24 Services concerning, I believe, noise?

25 A. Precisely.

1 variables"?

2 A. Such as attendance and, in fact, I think
3 theirs was mostly with behaviors rather than
4 achievement.

5 Q. Then I believe you did rely on the Edwards
6 study?

7 A. Yes, I did.

8 Q. And the Bowers study, you relied upon?

9 A. Yes.

10 Q. Bross, did you rely on that study in writing
11 your expert report?

12 A. No.

13 Q. Why did you not rely on this study?

14 MR. ELIASBERG: I'm sorry. You said Bross?

15 MS. GIORGI: Uh-huh.

16 MR. ELIASBERG: Okay.

17 THE WITNESS: I have to say that I'm -- the
18 study doesn't come to mind right now.

19 MS. GIORGI: Q. Then the next study
20 identified on table three is Burgess. You did rely on
21 Burgess, correct?

22 A. No, I don't believe I did.

23 Q. Okay. I figure I'll just double check. It
24 was my mistake. You did not rely on Burgess. Why did
25 you not rely on Burgess's study?

1 A. Because he dealt with classroom structure,
 2 with student configurations that I thought were
 3 probably not germane.
 4 Q. And the next study is Burkhalter. You did
 5 not rely on this study?
 6 A. No.
 7 Q. Why did you not rely on this study?
 8 A. If my memory serves me correctly, that study
 9 dealt with physical education facilities and I thought,
 10 again, it was not germane.
 11 Q. I believe you did rely on Cash and Chan 80,
 12 but did not rely on Chan 82; is that correct?
 13 A. Yes.
 14 Q. And why did you not rely on Chan's 82
 15 report?
 16 A. Because he was dealing with attitudes and
 17 not achievement.
 18 Q. And the next report is Chang and you did not
 19 rely upon Chang?
 20 A. No.
 21 Q. Why did you not rely upon Chang?
 22 A. Because that study was done in Hong Kong, if
 23 my memory serves me correctly.
 24 Q. And why did you consider a study done in
 25 Hong Kong not relevant to your report?

1 A. There may be some variables that I don't
 2 understand that might not be applicable to US schools.
 3 Q. Do you have an example?
 4 A. Not really, no.
 5 Q. Then the next study is Christie, which I
 6 believe you did not rely upon; is that correct?
 7 A. I thought I did.
 8 Q. It is not in your reference list.
 9 A. That was on noise. That did not deal with
 10 academic achievement.
 11 Q. Then I believe you did rely upon the two
 12 Cohen studies?
 13 A. Uh-huh.
 14 Q. And Cotterell?
 15 A. Cotterell.
 16 Q. You did not rely upon and why was that?
 17 A. It was on classroom design and configuration
 18 and not upon achievement.
 19 Q. Okay. Then you relied upon your study?
 20 A. Right.
 21 Q. And Garrett's study?
 22 A. Right.
 23 Q. But did not rely upon Grangaard?
 24 A. Grangaard.
 25 Q. Thank you.

1 A. Her study was on behaviors, the effect that
 2 lighting has on behaviors and other attributes, not
 3 with achievement.
 4 Q. And then the next study you did not rely
 5 upon is Harting?
 6 A. Yes.
 7 Q. And why did you not rely upon this study?
 8 A. We didn't include lighting in this report.
 9 Q. And why did you not include lighting in this
 10 report?
 11 A. Some of the studies dealt with the influence
 12 that lighting has upon blood pressure, on even
 13 cavities, and other non-academic variables.
 14 Q. And that is what Harting's report is about?
 15 A. Yes, lighting.
 16 Q. And its effect on biological systems?
 17 A. I guess.
 18 Q. Okay. And you said just then, we did not
 19 put it in the report. Did someone assist you in
 20 writing your report?
 21 A. No. No. It is an editorial "we."
 22 Q. Okay. Okay. Then back to the column of
 23 studies. Next study you did not rely upon was Hathaway
 24 and why did you not rely upon Hathaway?
 25 A. Because of the same subject matter.

1 Q. It was lighting as related to biological --
 2 A. Biological.
 3 Q. And not student achievement?
 4 A. That's right.
 5 Q. Then Hubeck?
 6 A. Yes; uh-huh.
 7 Q. You did not rely upon that study?
 8 A. No.
 9 Q. And why was that?
 10 A. Again, that was on structure of the
 11 classroom rather than achievement and building
 12 condition.
 13 Q. Hines, you did rely upon?
 14 A. Yes.
 15 Q. The next record is Hood Smith you did not
 16 rely upon?
 17 A. No.
 18 Q. And why not?
 19 A. Again, that was about features of a
 20 classroom, not the condition of the building.
 21 Q. Okay. Then you did rely upon Hyatt?
 22 A. Yes.
 23 Q. Ingram, you did not rely upon Ingram?
 24 A. No.
 25 Q. And why not?

1 A. Again, I did not include lighting in this
 2 report.
 3 Q. Then the next study is Javor or Javor. I
 4 don't know if I pronounced that right.
 5 A. Yes.
 6 Q. And you did not rely upon this study?
 7 A. No.
 8 Q. Why not?
 9 A. Again, classroom configurations.
 10 Q. The next study is -- is it Jue, J-u-e?
 11 A. That is what I think.
 12 Q. And you did not rely upon that study?
 13 A. No.
 14 Q. And why not?
 15 A. Because it dealt with lighting.
 16 Q. And Karst, you did not rely upon this study
 17 and why not?
 18 MR. ELIASBERG: Objection. Compound. Go
 19 ahead and answer it.
 20 THE WITNESS: Because I thought some of the
 21 methodology he used was not as rigorous as it might be.
 22 MS. GIORGI: Q. What was his methodology
 23 that you did not approve of?
 24 A. Well, he looked at building maintenance and
 25 how a building was maintained and -- in trying to

1 correlate that with achievement and I think that his
 2 definition of maintenance leaves a little bit to be
 3 desired and I don't think that really addresses
 4 building condition.
 5 Q. Could you explain to me what you mean by --
 6 explain the definition -- your definition of building
 7 maintenance that is a sufficient definition of building
 8 maintenance?
 9 MR. ELIASBERG: Objection. Misstates the
 10 witness's testimony.
 11 MS. GIORGI: Q. What do you believe is a
 12 sufficient definition of building maintenance?
 13 MR. ELIASBERG: Same objection.
 14 THE WITNESS: My definition of maintenance
 15 includes those activities designed to keep a building
 16 in its original condition.
 17 MS. GIORGI: Q. In Mr. Karst's study, what
 18 elements did he not include in his building
 19 maintenance?
 20 A. If my memory serves me correctly, he did the
 21 study in Alabama and he equated the condition of the
 22 building according to how the maintenance was done on
 23 the building and I don't think that it gave a true
 24 picture of differences in buildings from standard,
 25 modern buildings and poor buildings and so I thought it

1 was rather hazy, his definition of it.
 2 Q. Okay. The next study on this list, table
 3 three, is Kaufman. You did not use Kaufman's study,
 4 correct?
 5 A. That is correct.
 6 Q. And why did you not use Kaufman's study?
 7 A. I'm trying to dredge that one up. I can't
 8 remember right now.
 9 Q. Knight, did you use -- you did not use
 10 Knight's?
 11 A. No, I did not use him.
 12 Q. Why did you not use Knight's study?
 13 A. That I can't remember right now.
 14 Q. You -- do you recall Knight's study at all?
 15 A. I'm trying to recall it, yes. And I
 16 included it in other reviews, but not in this one
 17 because I think it was not germane, as I recall.
 18 Q. Okay. The next study is Krawitz. Did you
 19 use that study?
 20 A. No, I didn't.
 21 Q. And why did you not use it?
 22 A. Because it dealt with classroom facilities
 23 rather than building condition.
 24 Q. Then the next report is Krinsky. You did
 25 not use that report?

1 A. No.
 2 Q. And why not?
 3 A. Because I did not include lighting in the
 4 report.
 5 Q. The next report is London. You did not use
 6 that report?
 7 A. No.
 8 Q. Why did you not use that?
 9 A. It was about lighting.
 10 Q. The next report is Murrain. You did not use
 11 that report?
 12 A. No.
 13 Q. And why did you not use it?
 14 A. I'll have to by on that. I don't remember
 15 right now.
 16 Q. Do you remember the study?
 17 A. I remember it was about air-conditioning,
 18 but I can't recall the specifics.
 19 Q. Okay. I'm going to -- do you know how to
 20 pronounce that? Mwamwenda? And I believe you did not
 21 use that because it, again, deals with classroom
 22 structure?
 23 A. Also it was done in Africa and I thought it
 24 was not germane.
 25 Q. And, again, why did you think it was not

1 germane?
 2 A. Because I think the schools were different
 3 than schools in America.
 4 Q. I believe you did not use the Nash study?
 5 A. No.
 6 Q. And why was that?
 7 A. Because it looked at classroom facilities
 8 and not the total building conditions.
 9 Q. And Navarro?
 10 A. Did not use that because, again, it was
 11 limited to classroom structures.
 12 Q. O'Neil?
 13 A. Did not use that because it was limited to
 14 classroom.
 15 Q. Nicholas?
 16 A. Did not use that one because it dealt with
 17 lighting.
 18 Q. Peatross, you did use that study?
 19 A. No, I didn't.
 20 Q. And why not?
 21 A. It was a -- the study dealt with density of
 22 the classroom and I didn't think that it added to the
 23 body of knowledge that would be useful in this study.
 24 Q. When you say, "Density of the classroom,"
 25 what do you mean by that?

1 A. The number of students in the classroom.
 2 Q. Would that be similar to overcrowding?
 3 A. Not in his case. He is trying to establish
 4 some square footage parameters.
 5 Q. And did he use as his other variable student
 6 achievement?
 7 A. No, he did not. It was student activities
 8 and behavior.
 9 Q. The next study I believe you did not use was
 10 Piesler?
 11 A. That's correct.
 12 Q. Why did you not use Piesler's study?
 13 A. He looked at noise and behavior of students
 14 and it seems to me like that was special students.
 15 Q. The next study is Pritchard and I believe
 16 you did not use that report?
 17 A. Did not.
 18 Q. And why not?
 19 A. Judgment call. Although he came out and
 20 supported our position, I excluded it because it --
 21 well, I have to admit I really don't know why I did
 22 even though he was supportive of our position.
 23 Q. And the next study Rivera-Batiz, you used
 24 that study?
 25 A. I used his, yes.

1 Q. And Scagliotta, did you use that study?
 2 A. No, I did not.
 3 Q. And why not?
 4 A. The study did not address achievement
 5 directly. It was non-achievement, noneducational
 6 activities.
 7 Q. And Shea?
 8 A. Did not use that study because it was
 9 limited to classroom structures.
 10 Q. Summer?
 11 A. Excluded that one for the same reason.
 12 Q. And Stires?
 13 A. Excluded that one for the same reason.
 14 Q. Stueck?
 15 A. Excluded that for the same reason.
 16 Q. Sydoriak?
 17 A. His study was with lighting and I did not
 18 include lighting in the study.
 19 Q. Then there is Toleton?
 20 A. Did not use that one because it was limited
 21 to classroom facilities.
 22 Q. Wohlfarth?
 23 A. Did I -- I thought I -- it was with
 24 lighting. I excluded that because we did not include
 25 lighting.

1 Q. Then Yielding?
 2 A. His study was more on color and I didn't use
 3 it because of that.
 4 Q. Zentall 80, I believe you did use, but
 5 Zentall 88 you did not use?
 6 A. That's correct.
 7 Q. Why was that?
 8 A. Because that was with color. Color was not
 9 a variable.
 10 Q. On this chart to the right, the author has
 11 identified various categories as independent variables?
 12 A. Yes.
 13 Q. Noise, age, color, lighting maintenance,
 14 density, climate conditions, classroom structure.
 15 Beneath that, she has coded the studies. I believe "S"
 16 stands for significant findings?
 17 A. That's true.
 18 Q. "N" indicates no significant findings. "R"
 19 indicates there was a relationship found and "NR"
 20 indicates there is no relationship?
 21 A. Yes.
 22 Q. If I look down at your study --
 23 MR. ELIASBERG: I'm sorry. Where is that
 24 key?
 25 MS. GIORGI: It is the next page.

1 MR. ELIASBERG: Okay. Thanks.
 2 MS. GIORGI: Q. If I look at your study
 3 under noise, you found no relationship?
 4 A. True.
 5 Q. And this accurately reflects your study?
 6 A. Yes.
 7 Q. And yet I believe Hyatt has an "S." That is
 8 significant findings. How do you account for the two
 9 different results studying the same thing? I mean
 10 doing Hyatt's study and your study.
 11 A. I think there is a difference in how the
 12 study was conducted.
 13 Q. Do you recall what that difference was?
 14 A. The North Dakota study looked at the
 15 building condition as defined by the instrument that
 16 was used and then looked at the correlation between
 17 that and student achievement. The Hyatt study looked
 18 at noise as the independent variable associated with
 19 student achievement. Noise was not one of the items on
 20 the instrument to be used to evaluate appraised
 21 buildings.
 22 Q. It is your understanding that Hyatt used an
 23 instrument that did measure noise?
 24 A. Yes. Yes. And he was using that as the
 25 independent variable.

1 Q. Okay. And in your study, you wrote about
 2 noise, but you had no tool to measure noise?
 3 A. In the instrument, there was no item.
 4 Q. Then why did you write about noise in your
 5 report?
 6 MR. ELIASBERG: Objection. Assumes facts.
 7 MS. GIORGI: Well, we don't have the report,
 8 so I have to assume there is a conclusion. You must
 9 have written about it.
 10 MR. ELIASBERG: I want to make clear the
 11 report was publicly available.
 12 THE WITNESS: I think I need to know what
 13 document you are talking about.
 14 MS. GIORGI: I'm talking about your research
 15 out of North Dakota.
 16 THE WITNESS: Right; yes.
 17 MS. GIORGI: Q. And according to this
 18 chart, you have no relationship with noise.
 19 A. Right.
 20 Q. And that was a finding, correct?
 21 A. There was no -- I think I have to explain
 22 the chart. If there was no -- just because she put
 23 down there is no relationship doesn't necessarily mean
 24 that it was looked at. In other words, the instrument
 25 that we used did not ask or measure noise as an

1 independent variable and I think if you want to use
 2 noise as an independent variable, you must measure
 3 noise.
 4 Q. Okay. When I look at this chart again, if I
 5 were to compare your findings on color, you found a
 6 relationship, correct? Your report has a finding?
 7 A. Yes.
 8 Q. And Hines found no relationship?
 9 A. Yes.
 10 Q. What accounts or why did two studies
 11 studying the same variable come up with different
 12 findings?
 13 MR. ELIASBERG: Objection. Irrelevant.
 14 Calls for speculation.
 15 THE WITNESS: The only way that I could
 16 answer that is that studies come up and find no
 17 relationship on certain aspects. For instance, the
 18 study may find no relationship, significant
 19 relationship in reading, but they find it in math.
 20 Another study very similar and they come out and find
 21 out that there is a relationship with reading and there
 22 is not with math. So the only explanation I think that
 23 can be given on that is that what happened, it is the
 24 chance of finding a relationship or not finding a
 25 relationship.

1 Q. What do you mean, "The chance of finding a
 2 relationship or not finding a relationship"?
 3 A. Well, there may be some variables or there
 4 may be some conditions which the researcher is not
 5 aware that results in lower scores in one aspect than
 6 another and so that there is no explainable reason then
 7 why you would find a relationship one place and not
 8 another.
 9 Q. When the researcher starts their study and
 10 they select their environment like a school district or
 11 a city of schools, do they investigate those other
 12 conditions?
 13 MR. ELIASBERG: Objection. Calls for
 14 speculation.
 15 THE WITNESS: I don't know how to answer
 16 that one. It is hypothetical.
 17 MS. GIORGI: Right.
 18 Q. I'm trying to respond to essentially the
 19 generalization you just gave me that there could be
 20 conditions that will impact essentially the validity of
 21 a study and my question to you is, does the researcher,
 22 before he begins his study, search out those other
 23 conditions?
 24 MR. ELIASBERG: Objection. Compound.
 25 Objection. Misstates witness's testimony.

1 THE WITNESS: The researcher does not find
 2 these conditions before the study has begun.
 3 MS. GIORGI: Q. Do they investigate them
 4 after their study is done?
 5 A. They might try and control for them if they
 6 suspect that. For instance, a special population, if
 7 the school has a special population, then you might
 8 want to control for that in the statistical design of
 9 the study.
 10 Q. How would you statistically design the study
 11 to control for that factor?
 12 A. For a special student population?
 13 Q. (Ms. Giorgi nods.)
 14 A. That could be the number of students
 15 enrolled in special classes, percentage of the total
 16 population.
 17 Q. So the number enrolled versus the total
 18 population?
 19 A. Uh-huh; yes.
 20 Q. These classifications, significant findings,
 21 is that a term of art in your science?
 22 MR. ELIASBERG: You are referring to as the
 23 term is used in Lamasters in Earthman 2?
 24 MS. GIORGI: Yes.
 25 THE WITNESS: Would you repeat the question?

1 MS. GIORGI: Q. Is the term "Significant
 2 findings" a term of art in your science, your line of
 3 work?
 4 MR. ELIASBERG: Objection. Ambiguous.
 5 THE WITNESS: The term "Significance" is a
 6 term used to indicate a level of confidence, but there
 7 is a difference between two sets of data.
 8 MS. GIORGI: Q. And in parentheses, this
 9 author writes "At least a .05 level of significance."
 10 A. Yes.
 11 Q. And how is that .5 level of significance
 12 determined?
 13 MR. ELIASBERG: Objection. Misstates the
 14 exhibit. It is .05.
 15 MS. GIORGI: Q. Excuse me, .05 level of
 16 significance.
 17 A. The zero five level of significance is
 18 achieved through mathematical formula.
 19 MS. GIORGI: Q. Is this an area that you
 20 are familiar with, this mathematical formulation?
 21 A. I couldn't give you the formula because I
 22 don't think it is taught any more. With a computer,
 23 they don't have to. But when I see a level of
 24 significance of .05, then I read this meaning that out
 25 of 100 cases, at least 95 percent of the time, I would

1 find the results that I found in this study.
 2 Q. And then this author writes, "No significant
 3 findings." What does that term mean to you?
 4 A. That term means that there may have been a
 5 relationship, but it was not statistically significant.
 6 Q. What do you mean by, "Statistically
 7 significant"?
 8 A. That mathematically you cannot say that you
 9 will find this finding within this range. There may be
 10 a difference between a set of scores, but it is not
 11 large enough to mathematically be identified.
 12 Q. Does this mean that the relationship is
 13 unreliable?
 14 A. No.
 15 Q. What does it mean?
 16 MR. ELIASBERG: Objection. Asked and
 17 answered.
 18 THE WITNESS: Significance means that I have
 19 greater confidence in the findings.
 20 MS. GIORGI: Q. So if there is no
 21 significant findings, that means you have less
 22 confidence in the relationship between the two data
 23 sets?
 24 MR. ELIASBERG: Objection. Misstates
 25 testimony.

1 THE WITNESS: It doesn't necessarily mean
 2 that, no. It means that you statistically cannot prove
 3 the difference between these two scores.
 4 MS. GIORGI: Q. "R" indicates there was a
 5 relationship found.
 6 A. Yes.
 7 Q. And "NR" indicates there is no relationship
 8 found. These relationships are not statistically
 9 significant, correct?
 10 MR. ELIASBERG: Objection. Compound and
 11 vague.
 12 MS. GIORGI: Q. Okay. When the author
 13 identifies that a relationship is found, what does that
 14 mean?
 15 A. Relationship was found?
 16 Q. Yes.
 17 A. It means there was a difference in the
 18 scores and this relationship -- or there is a
 19 relationship between the independent variable and the
 20 score is found, but it cannot be proven that it is
 21 in -- within the confidence level of, say, five -- .05.
 22 Q. And when there is no relationship, what does
 23 that mean?
 24 A. It means there was no difference.
 25 Q. At the bottom of this same page of 205 of

1 Exhibit Earthman 2, there is a table that identifies
2 the variables, independent variables, significant
3 findings, nonsignificant findings, relationship found,
4 no relationship found. Shouldn't studies that examine
5 the same relationship yield similar results?

6 MR. ELIASBERG: Objection. Vague. Calls
7 for speculation.

8 THE WITNESS: When studies are completed
9 that are similar in nature, one would expect similar
10 results. However, there may be some intervening
11 variables that might cause some differences in the
12 findings. Let me give an example. In the Cash study,
13 she looked at behaviors -- incidents of behaviors.
14 Common knowledge would tell me that she should find
15 that the poor buildings had more incidents of behavior
16 and graffiti and so forth. And yet that is not what
17 she found. She found the exact opposite. Now, that is
18 contrary to popular opinion, common knowledge, and that
19 is -- you can't explain that with fact. You can say
20 this is the supposition.

21 MS. GIORGI: Q. Did your studies -- your
22 North Dakota study also study this behavior as Cash
23 did?

24 A. Yes.

25 Q. And your study came with the same results as

1 THE WITNESS: The way I would address this
2 table is that there were three studies that could not
3 find a relationship between noise and achievement or
4 noise and whatever they were trying to associate with.
5 Some were not achievement. Some were biological
6 things. And I would assume that it has to do with the
7 setting in which the study was completed.

8 MS. GIORGI: Q. So how does the setting
9 impact a study?

10 MR. ELIASBERG: Objection. Calls for
11 speculation and assumes facts.

12 THE WITNESS: If you are talking about the
13 studies on noise, I would assume that -- then you have
14 to determine where they were held. It is possible to
15 have noise in the classroom that kind of -- and unable
16 to really define what the point in which may be
17 whatever the activity is impaired and I think that is
18 the only way I would be able to explain that.

19 MS. GIORGI: Q. Under the maintenance
20 column, it has zero significant findings, zero
21 nonsignificant, seven relationship, and zero no
22 relationship. In looking at seven studies, would you
23 expect that to be the kind of result of studies
24 studying a similar variable?

25 MR. ELIASBERG: Objection. Vague. You can

1 Cash, correct?

2 A. Yes.

3 Q. And did Hines do the same study?

4 A. Yes.

5 Q. And did his end up with the same results?

6 A. Yes.

7 Q. Okay. But in these studies, we've got
8 significant findings such as noise as two significant
9 findings and three studies that have no relationship.

10 MR. ELIASBERG: Is that a question?

11 MS. GIORGI: Q. How can that be?

12 A. It is my understanding we were talking about
13 behavior incidence.

14 Q. Right. That was your example of three
15 studies that had -- essentially three results that were
16 the same results and then you explained the abnormal
17 results because of some unknown conditions or
18 hypotheticals, but here we've got in this table noise.
19 Where on one end of the spectrum, there are two
20 significant findings and at the other end of the
21 spectrum, three findings that there is no relationship
22 and my question is how can that happen?

23 MR. ELIASBERG: Objection. Misstates --
24 mischaracterizes what is in the table because it
25 completely leaves out the relationship found column.

1 answer.

2 THE WITNESS: I would look at maintenance.
3 That is a difficult term to define and I would not
4 think that this is unheard of. In fact, I think it
5 would be my opinion what we might find, given the fact
6 the definition of maintenance can vary from place to
7 place.

8 MS. GIORGI: Q. There are --

9 MR. ELIASBERG: Are you going to switch to a
10 different document? It has been about an hour. If
11 this is a natural breaking point.

12 MS. GIORGI: It is.

13 (Recess taken.)

14 MS. GIORGI: Q. Do you recall making this
15 statement: "When one realizes the many variables that
16 influence how much students can and do learn and how
17 students behave, it is evidence the built environment,
18 perhaps, has a very limited role to play."

19 A. Yes, that sounds familiar.

20 Q. Was that your opinion back in 1998?

21 A. I think that statement has to be put into
22 context because I think I state later on that in spite
23 of the fact that the variance that could be explained
24 by buildings is small, it is identifiable, which is
25 something that is, I think, very, very important and

1 the range of the variable is -- you know, outstanding.
 2 If there is five percent that can be explained, that is
 3 a sizable amount. But when you look at what the child
 4 brings to the school, then you might say that it is
 5 small.

6 Q. You also wrote, "Some researchers state that
 7 the building has such an insignificant influence upon
 8 the user that whatever influence may be found to exist,
 9 it is simply that of chance."

10 Do you recall making that statement?

11 A. Yes, I do.

12 Q. Do you concur with that opinion?

13 A. I would concur because there are some people
 14 who do state that. I do not agree with it myself, but
 15 there are people who do say that, yes.

16 Q. Could you identify one of those researchers
 17 for me?

18 MR. ELIASBERG: Objection. Misstates the
 19 witness's testimony. You can go ahead and answer.

20 THE WITNESS: One person that said a school
 21 has no influence upon a child's learning is James
 22 Conont back in, I think, 1957.

23 MS. GIORGI: Q. And do you know what he
 24 based his opinion on?

25 A. He did a survey. It was a survey, a

1 conclusion.

2 Q. Okay. Your earlier statements said some
 3 researchers. Can you think of any others besides Cohen
 4 and Weinstein?

5 MR. ELIASBERG: Objection. Misstates the
 6 witness's testimony. He said Conont.

7 MS. GIORGI: I'm sorry.

8 Q. James Cohen?

9 A. Conont.

10 Q. It has a "T"?

11 A. Yes, I'm sorry.

12 Q. Besides Conont and Weinstein, can you think
 13 of any other researchers who believe that the state of
 14 the buildings had such an insignificant influence upon
 15 the user that whatever influence may be found to exist
 16 is simply that of chance?

17 A. None come to mind immediately.

18 Q. In preparing your report, did you review any
 19 of the reports of these researchers that have, let's
 20 say, a different opinion than you do?

21 A. As far as Conont's report, that would have
 22 no bearing on what -- but as far as Weinstein, I have
 23 reviewed that article a number of times. I cited it
 24 several times. The studies that she included in her
 25 review, I don't think were germane to what we were

1 selected sample of students in his study. He was
 2 looking mainly at sizes of schools and it was his
 3 conclusion that schooling did not amount to much.
 4 Subsequently, obviously, there was a large number of
 5 people that disagreed with it. Subsequently, in a
 6 later publication, I can't recall which it is, but that
 7 statement was modified.

8 Q. The author modified it?

9 A. Right. But there are people that
 10 occasionally write in the field -- I can't remember any
 11 others -- but do say that the building makes very
 12 little difference.

13 Q. Can you recall anyone other than James
 14 Cohen?

15 A. Not right now I cannot.

16 Q. How about Weinstein, does that help refresh
 17 your recollection?

18 A. Uh-huh. Weinstein did a review of research.
 19 A good deal of the cases of the studies that she
 20 included in her study dealt with and included open
 21 space schools, which was popular back in the '70s, and
 22 I think that her conclusions on that might be fairly
 23 accurate, but we have so few open space schools today
 24 that I would discount what she wrote. The cases that
 25 she examined, I could see where she came out with that

1 looking at in this report.

2 Q. Do you recall, in preparing your report,
 3 reviewing any studies that came to a contrary result?

4 MR. ELIASBERG: Objection. Vague. Contrary
 5 to what?

6 THE WITNESS: There are some studies that
 7 have not found significant relationships. Those --
 8 some of which are included in the report here, but some
 9 are not and I've tried to base the opinion on whether
 10 to include it or not as if the studies are sound and
 11 they address the main question.

12 MS. GIORGI: Q. And the main question is?

13 A. Is there an influence -- does the building
 14 have an influence upon student achievement?

15 Q. And you found studies that found there not
 16 to be an influence, correct?

17 A. I found some studies, yes.

18 Q. And are those studies included in your
 19 report?

20 A. No.

21 Q. Okay. Could you identify one of those
 22 studies for me?

23 A. No, I can't really at the present time. I'm
 24 not clear on what the question is.

25 Q. Okay. At this present moment, you cannot

1 recall the names of the studies that found no
2 significant result?

3 MR. ELIASBERG: Objection. Misstates the
4 witness's testimony.

5 THE WITNESS: There are some studies, even
6 in here, that did not find significant results, but
7 found some relationships that were included in the
8 report.

9 MS. GIORGI: Okay. When we go through the
10 report, we'll probably get to those.

11 Q. In preparing your report -- when were you
12 first contacted about being asked to do a report? Do
13 you recall?

14 A. I think it must have been -- may have -- to
15 the best of my memory, it might have been somewhere
16 around 2000. Somewhere in that year 2000.

17 Q. And what did you do to prepare yourself to
18 write this report?

19 A. To write the report, I tried to review all
20 of the studies that I knew of that dealt with the
21 subject of relationships between school buildings and
22 student achievement or behavior.

23 Q. What else did you do?

24 A. Then I read the reports and I synthesized
25 the reports and wrote the -- or the research reports

1 Q. Did you receive comments from anyone who
2 reviewed your draft report?

3 A. Yes, I did.

4 Q. And did any of those comments suggest ways
5 in which you should modify your report?

6 A. The suggestions that I received were
7 questions raised about clarity of expression and in
8 some cases, some questions as to whether or not I
9 looked at certain studies and that was it.

10 Q. Did you receive materials to review in
11 preparation of your report?

12 A. Yes.

13 Q. What types of materials did you review?

14 A. There were some studies that Mr. Eliasberg
15 forwarded to me, had his office forward.

16 Q. And these were studies that you were unaware
17 of?

18 A. Some were. Some were not. Most of them
19 were not.

20 Q. And how were you unaware of some of the
21 studies? Was it they were just published in some place
22 you did not have access to?

23 A. Might have been. Might have been.

24 Q. Do you have any recollection why you were
25 unaware of some of the studies?

1 and then wrote the main report.

2 Q. Did you do any independent research
3 concerning the state of California schools?

4 MR. ELIASBERG: Objection. Vague as to
5 "Independent."

6 THE WITNESS: That is hard to answer because
7 I looked at -- through the normal national indices for
8 studies, regardless of location, and I found -- what I
9 found was included in here.

10 MS. GIORGI: Q. When did you have your
11 first draft of the report done, if you can recall?

12 A. If my memory serves me correctly, it was
13 probably six to eight months later. Could even be a
14 little bit longer than that, maybe nine, ten months.

15 Q. Did you submit your draft report to anyone
16 for review?

17 A. I sent it to Mr. Eliasberg.

18 Q. Did you have anyone else review your report,
19 your draft report?

20 A. No, I did not.

21 Q. Are you aware of anyone who may have
22 reviewed your draft reports?

23 A. I think there were -- yes, there was a
24 person in the ACLU in the northern branch. I forget
25 her name.

1 A. No. No.

2 Q. Again, what was the process you did to
3 identify all of the studies you wanted to rely upon?

4 A. I reviewed all of the studies that I could
5 find that dealt with this topic.

6 Q. Could you explain to me the process you used
7 to find these studies?

8 A. Some of the studies I had known about
9 beforehand, so the recollection was easy. But if I
10 were to start from scratch, I would use the two main
11 sources, the National Clearinghouse on Educational
12 Facilities -- it is probably one of the best sources of
13 research findings -- or also dissertation abstracts
14 which tell me about studies in this field. There are
15 other clearinghouses such as the one in Oregon,
16 University of Oregon, that have articles. Most of the
17 public literature and public journals are abstracted
18 through these clearinghouses and that is the main
19 source.

20 Q. Why did you not go to a university library
21 to obtain this information?

22 MR. ELIASBERG: Objection. Assumes facts.

23 THE WITNESS: To a university library?

24 MS. GIORGI: Yes.

25 THE WITNESS: I think you can find better

1 and more extensive information through the
2 clearinghouses.

3 MS. GIORGI: Okay.

4 THE WITNESS: There are some -- I should
5 clarify that, though. You can't just disregard a
6 library. When you find a source and find the -- what
7 it is, then that leads you to the library to find the
8 written document, so that when I look on the web page
9 of the clearinghouse, it will give a study and it will
10 give the numbers and then you go to the library and you
11 are able to obtain a copy of that.

12 MS. GIORGI: Q. Okay. So in preparing your
13 report, you searched on the national clearinghouse?

14 A. Yes.

15 Q. You looked through dissertation abstracts?

16 A. Yes.

17 Q. Possibly another clearinghouse from the
18 University of Oregon?

19 A. Yes.

20 Q. Any other steps you took to prepare?

21 MR. ELIASBERG: Well, you've omitted steps
22 he previously testified to.

23 THE WITNESS: There are some journals that I
24 have access to that sometimes they can include
25 reference to an article. There are some websites, too.

1 MS. GIORGI: I'm sorry. I don't have copies
2 of this.

3 Please mark this as Earthman Exhibit 3,
4 please.

5
6 (Whereupon, Defendants' Exhibit 3 was marked
7 for identification.)

8 MS. GIORGI: Q. Dr. Earthman, do you
9 recognize this document?

10 A. Yes; uh-huh.

11 Q. And what is this?

12 A. It is a memo that I sent Mr. Eliasberg.

13 Q. And what was the purpose of you sending this
14 memo to Mr. Eliasberg?

15 A. The purpose of the memo was to advise Mr.
16 Eliasberg on the status of my obtaining copies of
17 reports for him and assessment of some of the studies.

18 Q. Does that memo also reflect that you made
19 edits to your draft declaration pursuant to his
20 suggestions?

21 A. That I made edits of the draft?

22 Q. Yes.

23 A. Yes.

24 Q. And what was the substance of those edits?

25 A. Well, to clarify some of my writing.

1 For instance, the schoolfacilities.com identified this
2 latest report that you have here, the Mark Schneider
3 report.

4 MS. GIORGI: Q. Are there any other steps
5 you took to prepare to write your report other than the
6 ones you've already mentioned?

7 A. I think not.

8 Q. Are there any other areas other than what is
9 contained in your report in which you may intend to
10 testify to in the Williams case?

11 A. I don't think so.

12 Q. Do you have any further areas in which you
13 are investigating for the Williams case?

14 A. No.

15 Q. Are there any other maybe tentative opinions
16 that you may have that are not included in your report?

17 A. Tentative opinions?

18 Q. That is okay.

19 MR. ELIASBERG: Are you going to limit it to
20 Williams? I'm sure he has tentative opinions on all
21 sorts of subjects.

22 MS. GIORGI: Yes.

23 Q. But nothing you are working on for the
24 Williams case, correct?

25 A. Nothing.

1 Q. Isn't it a fact that you made an edit
2 because of the absence of reliable research?

3 A. I wouldn't agree with that statement. I
4 think lighting is a very important component of a
5 building condition. However, the studies that I cited
6 in here dealt with non-academic achievement variables
7 which I didn't really think added that much to the
8 case. As I said before, if I were writing this report
9 today, however, I would include lighting because of
10 recent studies, one done right here -- one done in this
11 state, a three-state study that came out with very
12 positive results. But at the time, I thought they
13 didn't address, really, the substance of which we
14 wanted to address.

15 Q. The procedure you used in drafting your
16 report, you did put in the lighting initially, correct?

17 A. Yes.

18 Q. And that was reviewed by the attorney?

19 A. Yes.

20 Q. And he made the suggestion to take it out?

21 A. No.

22 MR. ELIASBERG: There is no question
23 pending.

24 THE WITNESS: No.

25 MS. GIORGI: Q. Who suggested that the

1 lighting section be removed?
 2 A. I'm sorry. I didn't hear you.
 3 Q. Who made the suggestion that the lighting
 4 section of your draft report be removed?
 5 A. I did. Based upon what I had found, I
 6 suggested it to Mr. Eliasberg to see if he concurred.
 7 Q. And if he had not concurred, what would your
 8 opinion have been?
 9 MR. ELIASBERG: Objection. Calls for
 10 speculation.
 11 THE WITNESS: That is speculation, I think.
 12 I would have taken out that section because it doesn't
 13 really add to the whole argument.
 14 MS. GIORGI: Q. Were there any other
 15 sections besides lighting that you had initially put
 16 into your draft report that you subsequently removed?
 17 A. No.
 18 Q. When did you finalize your report?
 19 A. Best of my memory, it was sometime during
 20 the summer, last summer.
 21 MS. GIORGI: I think I'm done with this
 22 section. Is that good?
 23 MR. ELIASBERG: That is fine. If it is a
 24 natural break point, let's do it now.
 25 (Recess taken.)

1 MS. GIORGI: Q. I'm going to go back.
 2 Most of my questions now are going to be on your
 3 Earthman Exhibit 1, your report. The first paragraph,
 4 it identifies that you continue to teach graduate
 5 courses on school planning. Could you describe to me
 6 what these -- well, first of all, what is school
 7 planning?
 8 A. In the state of Virginia, superintendents
 9 are required to have a course in planning school
 10 buildings to obtain licensure, so every student that
 11 goes out of our program, as well as any other
 12 university, has to have a course on how to plan schools
 13 on his or her record and that is the course that I
 14 teach, how to plan schools.
 15 Q. And what does it mean to plan schools?
 16 A. It -- the planning aspect starts from
 17 financial considerations, need considerations,
 18 employment of architects, employment of planners, the
 19 writing of educational specifications, monitoring
 20 design, monitoring construction, and bringing the whole
 21 project to a closure.
 22 Q. Okay. And then it also says you advise
 23 students in their dissertation work?
 24 A. Yes, I still am on several committees.
 25 Q. Approximately how many students do you

1 supervise in a year?
 2 A. Now?
 3 Q. Uh-huh.
 4 A. I'm on three committees.
 5 Q. Are any of the students you are supervising
 6 now doing research in the field of buildings and
 7 student achievement?
 8 A. One could be classified as doing that. She
 9 wants to do something with principals and their
 10 responsibility.
 11 Q. You also state in your report you've been a
 12 consultant to over 70 schools?
 13 A. Approximately. I haven't counted them
 14 recently.
 15 Q. Were any of them out of California?
 16 A. No.
 17 MS. GIORGI: I believe this is Exhibit 4.
 18
 19 (Whereupon, Defendants' Exhibit 4 was marked
 20 for identification.)
 21 MS. GIORGI: Q. Dr. Earthman, do you
 22 recognize the document marked Earthman No. 4?
 23 A. Yes, I do.
 24 Q. What is this document?
 25 A. It is a report put out by the General

1 Accounting Office documenting the condition of the
 2 schools in America.
 3 Q. Is this the document you refer to in your
 4 report in paragraphs 15 and 16?
 5 A. I believe it is.
 6 Q. You say in paragraph 16 that "The GAO
 7 estimates that over half of the 42 million public
 8 school students attend school in buildings that need at
 9 least one or more major building component or feature
 10 extensively repaired."
 11 And you got that statement out of this?
 12 A. Right out of here, right.
 13 Q. In the results and brief of this report,
 14 page 2, it states, "Two-thirds of America's schools
 15 reported that all buildings were in at least overall
 16 adequate condition."
 17 Do you believe that statement is true?
 18 A. I believe it is true in the context in which
 19 it is given, although their statement that of 14
 20 million students in poor buildings, I think is also
 21 correct.
 22 Q. Okay. The 14 million students, that refers
 23 to the students that attend the remaining one-third
 24 schools?
 25 A. Yes. Well, it is over half of the -- that

1 is right; uh-huh.

2 Q. And this report states that these schools
3 are distributed nationwide?

4 A. Right.

5 Q. Is that your understanding, too?

6 A. Yes.

7 Q. Do you know what percentage, if any,
8 California has schools that either have overall
9 adequate condition or need extensive repair?

10 MR. ELIASBERG: Objection. Compound.

11 THE WITNESS: My understanding or my
12 recollection is they do list out state by state, but my
13 knowledge is not that clear on it, but the survey was
14 nationwide and included schools in California.

15 MS. GIORGI: Q. Could you look through the
16 indices and look to see if you can see a state by state
17 broken out?

18 A. There were three different reports in this
19 series and I know one of them listed all of the states
20 and I'm not positive if it is in this one or one of the
21 other ones. It has to be in one of the other ones.

22 Q. On the next page of the GAO report, at the
23 bottom of the second paragraph, it says, "Buildings
24 that have been well-maintained and renovated at
25 periodic intervals have a useful life equivalent to a

1 Q. Okay. And this is the document that you
2 refer to in paragraph 17?

3 A. Yes.

4 Q. For your statement that the average age of
5 school buildings in the United States was 40 years old,
6 does that statement come from page VI of document No.
7 5?

8 A. Yes.

9 Q. Right above that, this report says, "Because
10 the age of the building by itself may be somewhat less
11 important than its history of maintenance and
12 renovation, the more accurate indication of a school's
13 age is its functional age."

14 Do you agree with that statement?

15 A. Not necessarily.

16 Q. What do you mean by, "Not necessarily"?

17 A. If they mean that the current state of the
18 building is a better indices of its age after being
19 renovated, then I would agree with it.

20 Q. I believe it defines functional age as the
21 age of the school based upon the year of the most
22 recent innovation or the year of construction of the
23 main instructional buildings if no renovation has
24 occurred.

25 A. Yes.

1 new building."

2 Do you agree with that statement?

3 A. Yes.

4 MR. ELIASBERG: I'm sorry. Can you tell me
5 what page you are on?

6 MS. GIORGI: Page 3.

7 THE WITNESS: Yes; uh-huh.

8 MS. GIORGI: Q. You agree that buildings
9 that have been well-maintained and renovated at
10 periodic intervals have a useful life equivalent to a
11 new building?

12 A. Yes.

13 MS. GIORGI: I believe the next paragraph of
14 your report -- you refer to another report. I would
15 like to have this marked as Earthman Exhibit 5.

16
17 (Whereupon, Defendants' Exhibit 5 was marked
18 for identification.)

19 MS. GIORGI: Q. Do you recognize the
20 document Earthman Exhibit 5?

21 A. Yes.

22 Q. What is this document?

23 A. It is another report. This one is put out
24 by the National Center for Educational Statistics on
25 the condition of public school facilities.

1 Q. Now, does it comport to your understanding
2 of those terms?

3 A. Yes.

4 MR. ELIASBERG: Objection. Vague.

5 MS. GIORGI: Q. And with this definition,
6 do you agree with the sentence before?

7 MR. ELIASBERG: Objection. Compound.
8 Vague.

9 THE WITNESS: The statement leaves an awful
10 lot to be desired. The age of a building in and of
11 itself may not be important. The renovations or the
12 maintenance that could be applied to a building may or
13 may not make it a better school. If one takes the
14 classic definition of maintenance, doing those things
15 that would bring -- to keep it in its original state,
16 then there is a whole bunch of questions regarding how
17 adequate that building is for instructional purposes,
18 the size of classrooms, size of the library and so
19 forth. And I think that statement has to be taken
20 within the context of believing that there are other
21 factors in this that may make it not such a functional
22 building.

23 MS. GIORGI: Q. Would you identify the
24 characteristics that you believe make an older building
25 not functional?

1 A. Educationally not functional?
 2 Q. That's correct, educationally not
 3 functional.
 4 A. I would say size of classroom, configuration
 5 of the classroom, whether or not it has thermal
 6 control, adequate heating, ventilation, and
 7 air-conditioning, that it has adequate lighting, has
 8 adequate auxiliary facilities.
 9 Q. Could you explain to me what you mean by
 10 that, like gyms?
 11 A. Auxiliary facilities such as in the
 12 kindergarten where you have bathrooms. You may not in
 13 the older schools. And a library that is in -- within
 14 close proximity to the instructional spaces, modern or
 15 functional equipment and furniture, and a good writing
 16 surface, whether it is chalkboard or white board, and
 17 has access to some daylight. Those are the main ones.
 18 Q. Okay. Are you aware of any schools in
 19 California that would be, in your mind, an older school
 20 that has one or more of the conditions you just
 21 mentioned?
 22 A. No.
 23 MS. MITCHELL: Objection. Lacks foundation.
 24 MS. GIORGI: Q. Are you aware of any
 25 assessments of the California school facilities which

1 would identify one or more of the characteristics you
 2 just identified?
 3 MR. ELIASBERG: Other than the GAO reports
 4 he has mentioned?
 5 MS. GIORGI: I don't think the GAO covers
 6 this.
 7 THE WITNESS: No, I'm not aware.
 8 MS. GIORGI: Q. This report, Exhibit 5,
 9 identified three-fourths of the schools as being
 10 adequate. Do you agree or disagree with their
 11 conclusion?
 12 MS. MITCHELL: Lacks foundation.
 13 MR. ELIASBERG: Also compound and assumes
 14 facts, actually misstates.
 15 THE WITNESS: I don't know the basis of that
 16 study. When I see some of the other statistics, I
 17 would say they are not really as adequate as that
 18 statement might imply.
 19 MS. GIORGI: Q. Do you know how many
 20 students in California attend a school that needs one
 21 or more building components to be extensively repaired?
 22 A. I'm not aware of that, no.
 23 Q. Do you know what the average age of school
 24 buildings in California are?
 25 A. I'm not aware of it, no.

1 Q. Is it possible that a new school would have
 2 one of the characteristics that you identified in an
 3 old school?
 4 MR. ELIASBERG: Objection. Calls for
 5 speculation.
 6 MS. GIORGI: Q. You identified an old
 7 school as having poor configuration of classroom, class
 8 size, thermal controls, lighting, auxiliary facilities,
 9 library close by, modern equipment, writing surfaces,
 10 and access to daylight. Is it possible a new school
 11 would have these defects or deficiencies?
 12 MR. ELIASBERG: Objection. Misstates prior
 13 testimony.
 14 THE WITNESS: I can't imagine that
 15 happening, although it may well.
 16 MS. GIORGI: Q. In your mind, what is a new
 17 school?
 18 A. What is a new school?
 19 Q. Yes. What would you consider to be a new
 20 school?
 21 A. I try, in my writings, not to talk about new
 22 and old schools, but schools in better condition
 23 because a new school, in my definition, has to be one
 24 that is open just within the past year and that is not
 25 really what we mean by that in common parlance. Better

1 schools and functional schools are those that have all
 2 of the items that I mentioned, although in good
 3 condition and functioning and that school can be any
 4 number of years.
 5 MS. GIORGI: Then the next paragraph, I
 6 think it is 19 in your report, maybe it is 18 --
 7 paragraph 18, this is Earthman Exhibit 6.
 8
 9 (Whereupon, Defendants' Exhibit 6 was marked
 10 for identification.)
 11 MS. GIORGI: Q. Do you recognize this
 12 document?
 13 A. Yes, I've seen it. Yes.
 14 Q. Is this the document that is referred to in
 15 paragraph 18 of your report?
 16 A. Yes.
 17 Q. The second sentence of Exhibit 6, Earthman
 18 Exhibit 6 states, "Good facilities appear to be an
 19 important precondition for student learning, provided
 20 that other conditions are present, that support a
 21 strong academic program in the school."
 22 Do you agree with that statement?
 23 A. Yes; uh-huh.
 24 Q. Of the studies that you have reviewed, can
 25 you identify any that use as a control those -- excuse

1 me, a strong academic program in the school, any
2 studies that you have relied upon that used as a
3 control or as a variable factor that was controlled a
4 strong academic program in the school?

5 A. I think the studies that I have cited have
6 relied upon the standardization of the curriculum
7 throughout the school. Every state mandates a
8 curriculum, basic curriculum that they are required to
9 offer and I think that that has been a control measure
10 used in almost all of the studies.

11 Q. And the measure -- the control measure is
12 the fact that it is consistent?

13 A. Yes.

14 Q. Thank you. This report, Exhibit 6, also
15 identifies your report, the study of North Dakota high
16 schools, I believe. It says, "This state was selected
17 in part because of its relatively homogenous rural
18 population."

19 Is that true?

20 A. I believe it is.

21 Q. Why did you select a relatively homogeneous
22 rural population?

23 A. Because the students in that state have
24 systematically scored high on the SAT scores.

25 Q. What does relatively homogeneous, that

1 Georgia or other places. I have every reason to
2 believe that they should.

3 MS. GIORGI: Q. Okay. I'm going to go back
4 to your report now. In paragraph 19 of your report,
5 you list eight studies, the most recent being 1959.

6 A. Right.

7 Q. Are you aware of any more recent studies?

8 A. No.

9 Q. In paragraph 20, you identify eight studies,
10 the most recent being 1997.

11 MR. ELIASBERG: There is no question
12 pending.

13 THE WITNESS: I think Chan was 1980.

14 MR. ELIASBERG: There is no question
15 pending, so there is no need for an answer.

16 MS. GIORGI: Q. Was the Lemasters 1997
17 study, what was that study about?

18 A. The Lamasters study was a review of research
19 on -- for studies concerning the condition of school
20 buildings and student achievement and behavior.

21 Q. It is not an independent study --

22 A. No.

23 Q. -- of these conditions?

24 A. No. It is not a study in and of itself.

25 Q. Okay. The Chan 1980 study, was that a study

1 population, how does that impact your study?

2 MR. ELIASBERG: Objection. Assumes facts.

3 THE WITNESS: It should facilitate the
4 study. At least that is controlled, the population is
5 controlled, so that students and communities are very,
6 very similar.

7 MS. GIORGI: Q. Why is the similarity of
8 the population important?

9 A. It is one more control.

10 Q. And in the rural population, why was that
11 important?

12 A. It wasn't. It just happened to be rural.

13 Q. Can your study's findings be applied to a
14 nonhomogeneous population?

15 MS. MITCHELL: Calls for speculation.

16 MR. ELIASBERG: Thank you.

17 MS. MITCHELL: Lacks foundation.

18 THE WITNESS: I didn't hear.

19 MR. ELIASBERG: Calls for speculation and
20 lacks foundation and incomplete hypothetical.

21 THE WITNESS: If a study like the North
22 Dakota study or any number of the studies in this whole
23 area were done in a school division in California, I
24 would fully expect that researcher to obtain the same
25 results as I did in North Dakota or others did in

1 of these thermal conditions?

2 A. Yes, among other things.

3 Q. Was that a published study?

4 A. Yes.

5 Q. Was it subject to peer review?

6 A. That one was not.

7 Q. Do you know the methodology used in this
8 study? Do you recall?

9 A. Well, yes. The study looked at
10 air-conditioning, carpeting, and fluorescent lighting

11 because then they had schools that had
12 air-conditioning, nonair-conditioning, incandescent
13 lights and fluorescent, and carpeting and noncarpeting
14 and his result was that he found a significant
15 relationship between the scores of the students in
16 those buildings that didn't have air-conditioning and
17 those that did.

18 Q. When you say "Significant" --

19 A. Yes.

20 Q. -- "relationship" --

21 A. At the .05 level of significance.

22 Q. Okay. Was his sample randomly selected?

23 A. It was randomly selected, but it consisted
24 of Georgia school divisions.

25 Q. Were there any limits to that selection?

1 MR. ELIASBERG: Objection. Vague.
 2 THE WITNESS: That I can't really answer.
 3 MS. GIORGI: Q. Did Chan have any
 4 limitations to his research, identified limitations?
 5 A. He used the SES or the percent of students
 6 in free and reduced lunches to control for the
 7 population and he, like other researchers, relied upon
 8 the uniformity of the teaching staff and the curriculum
 9 as offered.
 10 Q. In paragraph 21, you cite a report by
 11 Harner. Was that report -- I believe that report was
 12 published?
 13 A. Yes, you are right.
 14 Q. Was it subject to peer review?
 15 A. Yes.
 16 Q. And was the sample there randomly selected?
 17 A. No.
 18 Q. And were the findings significant to a .05?
 19 A. His study looked at the achievement levels
 20 of students that were in -- when he varied the
 21 temperature and my understanding is that he did -- my
 22 recollection of the study is that he did run a
 23 correlation and that they were significant.
 24 MR. ELIASBERG: Suzanne, can we take a
 25 two-minute bathroom break?

1 MS. GIORGI: Yes.
 2 MR. ELIASBERG: Thank you.
 3 (Recess taken.)
 4 THE WITNESS: I think I should clarify
 5 something, that I was confusing Harner's study with
 6 another one. Harner is really a review of the studies
 7 that were completed and he didn't complete one.
 8 MS. GIORGI: Okay.
 9 THE WITNESS: I was confused with someone
 10 else.
 11 MS. GIORGI: Q. Also in paragraph 21, you
 12 reference a report by Lanham, 1999.
 13 A. Yes.
 14 Q. Are you familiar with that study?
 15 A. Yes.
 16 Q. How are you familiar with that study?
 17 A. Lanham was one of my students and I directed
 18 that study.
 19 Q. And was this study published?
 20 MR. ELIASBERG: Objection. Vague as to
 21 "Published."
 22 THE WITNESS: It is published because it is
 23 on the internet.
 24 MS. GIORGI: Q. Okay. Was it ever selected
 25 for publication by a journal?

1 A. No, it was never submitted.
 2 Q. Was it subject to peer review?
 3 A. All doctoral studies are subject to a peer
 4 review of a committee of five professors.
 5 Q. Were you one of those professors?
 6 A. Yes.
 7 Q. And who were the others, if you can recall?
 8 A. David Parks, Carol Cash, Richard Salmon, and
 9 I forget the fifth one.
 10 Q. Do you recall his methodology?
 11 A. Yes, somewhat; uh-huh.
 12 Q. Could you describe it for us, please.
 13 A. Lanham used the building condition report as
 14 determined by Commonwealth Assessment of School
 15 Facilities Instrument and then correlated that with the
 16 scores of students on the ITBS. Now, he also ran a
 17 regression which enabled him to come out with his
 18 statement that after controlling for the SES, the most
 19 important building factor that influenced learning was
 20 air-conditioning.
 21 Q. Do you recall if there was a second factor
 22 identified?
 23 A. There were --
 24 MR. ELIASBERG: Second factor --
 25 THE WITNESS: -- I think three or four, but

1 one of them was the quality of the roof, intact roof.
 2 One was the amount of graffiti in a building, but I
 3 don't know the order after the first one.
 4 MS. GIORGI: Q. Do you know if his findings
 5 were found to be significant to a .05 level? And I'm
 6 talking just about the air-conditioning.
 7 A. Uh-huh; yes, he did.
 8 Q. Do you know whether the roof was also found
 9 significant to a .05?
 10 A. No.
 11 Q. It was not significant to a .05 or you don't
 12 recall?
 13 A. I don't remember.
 14 Q. Do you recall if Mr. Lanham had any
 15 limitations on his study?
 16 MR. ELIASBERG: Objection. Vague and
 17 ambiguous.
 18 THE WITNESS: The use of or the use of
 19 limitations, every study has limitations and the
 20 researcher tries to identify them, one of which is that
 21 maybe, maybe not that the test achievement test
 22 measures what students learn. Those are subsumed in
 23 all research reports. Now, he had similar limitations.
 24 Because of the nature of Virginia, why, the teaching
 25 staff throughout the state was uniform as was the

1 curriculum.

2 MS. GIORGI: Q. And how do you know that
3 the teaching staff is uniform?

4 A. Virginia, like most states, license all
5 teachers and they must have licenses to teach. This
6 licensure is based upon a prescribed program of studies
7 that the universities must offer to be approved to
8 produce teachers so the state has control over the
9 preparation of teachers.

10 Q. To teach in Virginia, you must have a
11 Virginia license?

12 A. Yes.

13 Q. And that license must have been obtained by
14 attending a Virginia curriculum school?

15 A. Yes.

16 Q. University?

17 A. Right; yes.

18 Q. Okay. In paragraph 23, your very last
19 sentence says, "In spite of the age of this research,
20 these findings are just as germane today as they were
21 three quarters of a century ago."

22 What do you mean by "Germane"?

23 A. They are used by architects to design
24 buildings.

25 Q. How is this applicable to the schools?

1 THE WITNESS: No.

2 MS. GIORGI: Q. And Duffy 1992?

3 A. No.

4 Q. You state, "The methodology used by these
5 researchers is appropriately controlled for other
6 factors thereby isolating the relationship between
7 acoustic conditions and student health and
8 achievement."

9 What did you mean by that statement?

10 A. When I reviewed these studies, their
11 methodology attempted to control for the variables of
12 not only student variance, but also building conditions
13 that might be present.

14 Q. What do you mean by "Student variance"?

15 A. The population that they selected and used.

16 Q. Why would the student population variance be
17 important?

18 A. I think that in some of the studies, and I'm
19 not -- I couldn't identify which of these, they tried
20 to randomize the selection of students, but I couldn't
21 address which one.

22 Q. In paragraph 26, the Bronzafit study is
23 mentioned and they identify noise abatement measures.
24 Are you aware of any California noise abatement
25 measures -- let me rephrase it.

1 MR. ELIASBERG: Objection. Vague.

2 MS. GIORGI: Q. How is the study applicable
3 to the schools?

4 A. If an architect were to be designing a
5 school building, the architect would certainly want to
6 comply with all of the regulations of the state and
7 most state regulations are based upon this or similar
8 studies.

9 Q. Are you aware of any similar study that was
10 applicable to schools?

11 A. No.

12 Q. You identify in paragraph 24 Conont, Evans,
13 Krantz, and Stokols research, 1980. Do you recall that
14 study?

15 A. Noise levels, no. I recall it, but I
16 don't -- can't speak to it.

17 Q. How about Zentall and Shaw also 1980, do you
18 recall that study?

19 A. No.

20 Q. Conont et al., 1981?

21 A. No.

22 Q. Hyatt, 1982?

23 A. No.

24 MR. ELIASBERG: I believe he has already
25 testified as to Hyatt.

1 Are you aware of any noise abatement
2 measures utilized by any of the school districts in
3 California?

4 A. No, I'm not.

5 Q. Are you aware of any statewide regulations
6 regarding noise abatement measures?

7 A. Not regulations.

8 Q. Laws?

9 A. No.

10 Q. Okay. Are you aware of any of the
11 restraints in California onsite selections?

12 A. No, I'm not.

13 Q. In paragraph 27, you state, "All of these
14 studies are seminal works that aptly demonstrate the
15 devastating effect of unwanted noise in the classroom."

16 What do you mean by "Devastating"?

17 A. Detrimental, that impede the learning of
18 students.

19 Q. In your opinion, how noisy must it be in the
20 classroom to impede the learning for a student?

21 MR. ELIASBERG: Objection. Lacks
22 foundation.

23 THE WITNESS: The studies that I cited here
24 use several -- they didn't use any decibel ratings.
25 They measured the effect of, in one, a train noise on

1 children and the lack of noise on the children. They
2 compared the scores of students in noisy and less noisy
3 rooms.

4 MS. GIORGI: Q. Is there any research in
5 this area that identifies how long and what degree
6 someone has to be subject to this adverse condition
7 before there is an impact?

8 MS. MITCHELL: Lacks foundation.

9 THE WITNESS: Not the longitudinal aspect of
10 it.

11 MS. GIORGI: Q. When you say, "Not the
12 longitudinal aspect," what do you mean?

13 MR. ELIASBERG: Misstates prior testimony.

14 MS. GIORGI: Q. What do you mean when you
15 use the phrase "Longitudinal" --

16 A. Long-term effect.

17 Q. So are you aware of any long-term effect
18 studies based on noise and student achievement? Does
19 that -- long-term studies studying noise and student
20 achievement?

21 A. Not in that context.

22 Q. What context are you aware of?

23 A. Bronzaft looked at noise, students when
24 there was a noise factor, and then she looked at the
25 scores of students after abatement methods were. Now,

1 say.

2 Q. Then in paragraph 29, you identify the
3 McGuffey and Brown report of 1978. Do you recall that
4 study?

5 A. I remember reading it.

6 Q. Okay. Do you recall if it was published?

7 A. Yes, it is published.

8 Q. And if it was subject to peer review?

9 A. By professional educators, yes.

10 Q. Could you describe the methodology of the
11 study?

12 A. I'm probably not that clear on the McGuffey
13 and Brown study.

14 Q. Do you recall whether or not they utilized a
15 random sample?

16 A. No, they did not.

17 Q. Do you recall whether or not their findings
18 were found to be significant to a .05?

19 A. That I couldn't tell you.

20 Q. On the Plumley, 1978 study?

21 A. Yes.

22 Q. Do you recall that study?

23 A. Yes.

24 Q. Was that study published?

25 A. Not to my knowledge.

1 granted it is not the same student body, but it is the
2 same building, same teaching staff, same building and
3 same everything else, curriculum.

4 Q. Can you recall if her findings were found to
5 be significant to a .05 level of confidence or not?

6 A. I can't remember at the present time.

7 Q. Going down to paragraph 28, in your research
8 regarding North Dakota, you found no relationship
9 regarding age; is that correct?

10 MR. ELIASBERG: Objection. Misstates prior
11 testimony.

12 THE WITNESS: Yes.

13 MS. GIORGI: Q. Okay. You state in the
14 second sentence, "Age of building in and of itself is
15 usually not an important factor in influencing student
16 performance."

17 Do you base that upon your research?

18 A. It's, I think, a fact that the age
19 specifically is not a factor.

20 Q. And your research supports that, correct?

21 A. I don't think my research can support that,
22 no.

23 Q. Okay.

24 A. I think that is a fact that -- none of my
25 research would address that in and of itself, I should

1 Q. Do you recall whether or not it was subject
2 to peer review?

3 A. Peer review of the doctoral committee, yes.

4 Q. And do you recall its methodology, what they
5 looked at?

6 A. Yes. They looked at older and new
7 buildings. It seems to me like he took the -- of all
8 the buildings in Georgia, he took the bottom 11 and top
9 12 and compared -- in age and then compared the
10 achievement scores between the two groups and my
11 recollection was it was significant on the .05 level.

12 Q. Because he chose the top and the bottom?

13 A. Age wise, the newest and the oldest to get
14 the extremes.

15 Q. There would not have been any random
16 involved?

17 A. No.

18 Q. Okay. On the Chan study, 1979, do you
19 recall that study?

20 A. Yes. It seems to me it was in the middle
21 schools and that was not -- see, if that was random or
22 not. It wasn't random selection of schools.

23 Q. Do you recall whether or not it was
24 published and/or subject to peer review?

25 A. It was published and that one was subject to

1 a doctoral committee.
 2 Q. I'm sorry if you've already covered this.
 3 Was this found to be significant or a .05 level, Chan's
 4 studies?
 5 A. Just the age.
 6 Q. Chan studied other factors?
 7 A. Yes.
 8 Q. Was temperature one of the factors that Chan
 9 studied?
 10 A. He did that in a different study.
 11 Q. Okay. Light, was that part of Chan's 1979
 12 study?
 13 A. I'm not certain.
 14 Q. Was noise part of Chan's study?
 15 A. Not certain.
 16 Q. Okay. And we go to Garrett, 1981. Do you
 17 recall that study?
 18 A. Yes, I do.
 19 Q. And was it published?
 20 A. That -- no, it was not published, to my
 21 knowledge.
 22 Q. Was it subject to peer review, a doctoral --
 23 A. Yes.
 24 Q. Could you describe the methodology used by
 25 Garrett?

1 A. Garrett used basically the same -- wait a
 2 minute. He looked at some nonmodernized, modernized,
 3 or partially modernized buildings and -- in Georgia and
 4 then compared them to the achievement scores.
 5 Q. Do you know whether or not he utilized a
 6 random sample?
 7 A. No, he did not.
 8 Q. Do you recall the significance level?
 9 A. No, I do not.
 10 Q. For the Bowers and Burkett, 1988 study, do
 11 you recall whether or not this was published?
 12 A. Yes, it was.
 13 Q. And do you recall whether it was subject to
 14 peer review?
 15 A. It was in the publication, yes.
 16 Q. Could you describe its methodology?
 17 A. They used two schools in a one-school
 18 system, one was old and then -- well, one was, I think,
 19 1936 and then the students in the 1923 building were
 20 moved into a new building and he compared those two
 21 groups.
 22 Q. Do you recall what length of time?
 23 MR. ELIASBERG: Objection. Vague.
 24 THE WITNESS: Yeah.
 25 MS. GIORGI: Q. Do you understand the

1 question?
 2 A. Right.
 3 Q. They moved to a new building. The length of
 4 time they were at that building, did he study it over
 5 time, their results?
 6 A. My recollection is that they were in there
 7 for approximately eight months. In the fall, they
 8 moved, is my recollection.
 9 Q. So when they were assessed, I believe it was
 10 a test assessment?
 11 A. Right.
 12 MR. ELIASBERG: Objection. Compound.
 13 MS. GIORGI: Q. How long had the students
 14 been in the new school when they were tested?
 15 MR. ELIASBERG: Asked and answered.
 16 THE WITNESS: Approximately eight, eight and
 17 a half months.
 18 MS. GIORGI: Q. Was there any follow-up
 19 studies?
 20 A. On that?
 21 Q. That group of students.
 22 A. Not to my knowledge.
 23 Q. Do you know if the findings by Bowers and
 24 Burkett were found to be significant to a .05?
 25 A. I can't state that factually right now.

1 Q. With Phillips 1997 study, do you recall that
 2 study?
 3 A. Yes.
 4 Q. And was that published, that study
 5 published?
 6 A. I don't believe it was.
 7 Q. Do you know if it was subject to a peer
 8 review?
 9 A. Yes, it was, by a doctoral committee.
 10 Q. Could you describe the methodology of the
 11 Phillips study?
 12 A. He had three groups, 3rd, 4th, and 5th --
 13 spanning 3rd, 4th, and 5th grades and in group one, all
 14 three grades remained in old buildings. In the second
 15 group, 3rd and 4th were in old buildings and 5th in new
 16 buildings and in the third group, the 4th and 5th were
 17 in new buildings, so they had a period of time in the
 18 buildings.
 19 Q. Was this a randomly selected school
 20 population?
 21 A. No, it was not.
 22 Q. Did he control who was in group one, two, or
 23 three?
 24 A. No, these were assigned by the school
 25 system.

1 Q. And do you know if his findings were found
2 to be significant to a .05 level?
3 A. I couldn't state that for a fact.
4 Q. In paragraph 31, you refer to Berner?
5 A. Yes.
6 Q. 1993. Do you know if that study was
7 published?
8 A. Yes.
9 Q. Do you know if it was subject to peer
10 review?
11 A. Yes, it was.
12 Q. And what was the methodology of the Berner
13 study?
14 A. She basically compared the elementary
15 conditions of the building with achievement scores.
16 She used a committee of architects and engineers and
17 even community people to assess the buildings so that
18 she could arrive at two groups. And based upon that,
19 then she ran her analysis on the scores, achievement
20 scores.
21 Q. Do you know if the buildings were chosen in
22 a random manner?
23 A. My understanding, they were.
24 Q. And she also ran some control factors?
25 A. I'm sorry. I didn't hear you.

1 Q. Did Berner control with the percentage of
2 students participating in a free lunch program?
3 A. She did.
4 Q. And did she control for any other factors?
5 A. No specific controls.
6 Q. Was her finding significant to the .05
7 level?
8 A. Yes.
9 Q. This statement midway down in paragraph 31
10 says, "She found a significant difference of five
11 percentile points in the achievement scores of students
12 in poor buildings compared with scores of students in
13 excellent buildings."
14 What do you mean by, "Five percentile points
15 in achievement scores"?
16 A. When all of the scores are placed upon a
17 scale from zero to 100, a percentile ranking tells a
18 researcher how many cases are below so that if my
19 school is in the 47th percentile, I know that 46 other
20 schools are beneath me and likewise. Now, the scores
21 on the students -- on the schools in the poor buildings
22 were five percentile point different between the
23 students in the better buildings.
24 Q. Did she identify an average test score per
25 school?

1 A. Right.
2 Q. Then made an array of each school's average
3 test score?
4 A. Yes.
5 Q. To develop this percentile ranking?
6 A. Yes.
7 Q. And then compared the lower scores of the
8 poor to the higher scores of the schools that were in
9 excellent condition?
10 A. Yes; that's correct.
11 Q. Cash, 1993, do you -- was this study
12 published?
13 A. Yes.
14 Q. Was it subject to peer review?
15 A. Yes.
16 MS. GIORGI: You don't have to guess because
17 I have this one. I would like to mark this as Exhibit
18 7, Earthman 7.
19
20 (Whereupon, Defendants' Exhibit 7 was marked
21 for identification.)
22 MS. GIORGI: Q. Do you recognize Earthman
23 7?
24 A. Yes.
25 Q. What is this?

1 A. It is a dissertation that Carol Cash
2 completed.
3 Q. Did you assist her in any way?
4 A. Yeah, I was the director of the study.
5 Q. And could you just briefly describe the
6 methodology of her study?
7 A. Cash selected rural high schools of Virginia
8 for this study and included all of them. If my memory
9 serves me correctly, it may have been 41. Then each
10 building was evaluated, assessed using an instrument
11 that she and I developed to measure the condition of
12 the building. She subsequently divided them into
13 quartiles, so you have the bottom quartile, and the top
14 quartile and the middle two quartiles. She took the
15 achievement scores and then ran a correlation on the
16 difference between the scores of the two sets of
17 buildings.
18 Q. She also did correlation studies between the
19 middle and bottom and the middle and the top, correct?
20 A. Yes. I'm sorry, yes.
21 Q. But were there any significant findings
22 between her comparisons between the bottom and the
23 middle?
24 A. No.
25 Q. And were there any significant findings

1 between the middle and the top?
 2 A. No.
 3 Q. There were significant findings between the
 4 comparison of the bottom and the top schools?
 5 A. Yes.
 6 Q. On page 14, the second paragraph, Ms. Cash
 7 identifies the limitation of her study and it says, "It
 8 is impossible to identify all the variables which could
 9 affect student achievement and behavior. This could
 10 result in a large error variance and a less significant
 11 correlation in the variables of interest."
 12 What does that mean?
 13 MR. ELIASBERG: Objection. May call for
 14 speculation.
 15 THE WITNESS: That is put in there by --
 16 similar limitations are put in by all scholars to try
 17 to identify some possible limitations that may occur in
 18 the study and, of course, it is always impossible to
 19 identify all variables. In the social science
 20 research, that is impossible.
 21 MS. GIORGI: Q. "Could result in a large
 22 error variance."
 23 Did she identify an error variance?
 24 A. No.
 25 Q. What is an error variance?

1 A. It would distort the variance that might be
 2 attributable to a certain variable that you are looking
 3 at. There might be confounding variables.
 4 Q. And a less significant correlation in the
 5 variables of interest --
 6 A. Would be --
 7 MR. ELIASBERG: There is no question
 8 pending.
 9 MS. GIORGI: Q. What would that mean?
 10 A. That would mean the distortion in the
 11 variable that you've identified as being important or
 12 having certain percentage of explanation.
 13 Q. Okay. I'm done with Cash.
 14 In paragraph 31, you also identified Hines,
 15 1996. Are you familiar with this study?
 16 A. Yes.
 17 Q. And how are you familiar with this study?
 18 A. I directed the study.
 19 Q. Do you recall whether it was published?
 20 A. No, it has not been published.
 21 Q. Was it subject to peer review by the
 22 doctoral committee?
 23 A. Doctoral committee, right.
 24 Q. Could you describe the methodology of the
 25 Hines study?

1 A. It was a replication of the Cash study and
 2 the only difference was his population. He used urban
 3 or large high schools, really in Virginia.
 4 Q. Are the large high schools located in urban
 5 settings?
 6 A. Some of them are. Most of them are, right.
 7 Q. Was his study all of the schools or a
 8 selected sample?
 9 A. All of the schools.
 10 Q. And do you recall whether or not his
 11 findings were found to be significant at a .05 level?
 12 A. They were not subject to that kind of
 13 significant. They were reported as percentile ranks.
 14 Q. When you say, "They were reported as
 15 percentile ranks," what do you mean by that?
 16 A. The score for each school was -- the
 17 achievement score for each school was reported as a
 18 percentile on the total.
 19 Q. Similar to Berner?
 20 A. Yes.
 21 Q. Where there was an array?
 22 A. Right; yes.
 23 Q. So Hines took all the test scores in one
 24 school, created an average test score for that school?
 25 A. Right.

1 Q. And then created an array of numbers?
 2 A. Yes.
 3 Q. And was there any statistical validity test
 4 run on his data?
 5 A. They did -- he did a correlation, right.
 6 Q. And what were the results of that test?
 7 A. The results were that the differences were
 8 significant. Now, I can't recall whether they were at
 9 the .05 or something else.
 10 Q. Down now to paragraph 32, Anderson, 1999, do
 11 you recall that study?
 12 A. Yes.
 13 Q. And how are you familiar with that study?
 14 A. I've read it.
 15 Q. And was this study published?
 16 A. Not to my knowledge.
 17 Q. Was it subject to peer review?
 18 A. Yes, it was.
 19 Q. Doctoral?
 20 A. Yes.
 21 Q. Could you describe the methodology of the
 22 Anderson study?
 23 A. He developed an instrument called something
 24 like design -- dash design appraisal something else.
 25 Anyway, there were about 38 design features of a school

1 that he identified that -- these design features can be
 2 an entrance to the school -- that showed people where
 3 the entrance of the school should be, a relationship
 4 between, say, the library and classrooms,
 5 administrative -- presence of administrative offices
 6 and so forth. Anyway, I think 38 of them and then he
 7 applied this to the -- to selected school divisions in
 8 Georgia and ran a correlation between the scores of the
 9 buildings and the student achievement.

10 Q. Do you know if the selected schools were
 11 selected randomly or not?

12 A. I would gather not because they were in a
 13 central area.

14 Q. And do you recall whether or not his
 15 findings were found to be at a .05 significance?

16 A. My memory says that they were, but just what
 17 he found -- you know, he didn't -- he found that there
 18 were, I think, 27 of the design elements that were
 19 significant.

20 Q. Okay. The Ayers report.

21 A. That was a companion study of the Anderson
 22 study and she used the same methodology and the same
 23 instrument, but it was on the elementary schools rather
 24 than high schools.

25 Q. And O'Neill, was he part of this?

1 study?

2 A. Yes.

3 Q. And how are you familiar with that?

4 A. I read about it.

5 Q. Okay. Was this study published in a
 6 journal?

7 A. Yes.

8 Q. And was it subject to peer review?

9 A. Yes.

10 Q. Was that doctoral review?

11 A. Yes.

12 Q. And can you describe the methodology used by
 13 O'Neill?

14 A. O'Neill developed an instrument based upon
 15 the Council on Educational Facility Planners Appraisal
 16 Guide and the instrument that Carol Cash and I
 17 developed, he applied this to selected school systems
 18 in Texas.

19 Q. Do you know if he randomly selected those
 20 Texas, is it schools or --

21 A. School systems, school district, I think.

22 Q. Okay.

23 A. No, he did not.

24 Q. Do you know if his findings were found to be
 25 significant at a .05 level?

1 A. No. No, he was not.

2 MR. ELIASBERG: Glen, you need to -- it
 3 makes it very hard for the court reporter if you start
 4 before the question is finished. Make sure you give
 5 the court reporter a chance to get down everything that
 6 is being said.

7 MS. GIORGI: Q. Back to the Ayers report,
 8 was the Ayers report published?

9 A. Not to my knowledge.

10 Q. Was it subject to a peer review, doctoral?

11 A. Yes.

12 Q. Do you recall whether or not the findings of
 13 the Ayers report were found to be significant to a .05
 14 level?

15 A. Some of them were and I am trying to think
 16 which design elements were significant and it just does
 17 not come to mind.

18 MS. GIORGI: Would now be a good time to
 19 take a break?

20 MR. ELIASBERG: Yes, I think it would be a
 21 fine time.

22 MS. GIORGI: Okay.

23 (Recess taken.)

24 MS. GIORGI: Q. We're on paragraph 32, the
 25 O'Neill study. Are you familiar with the O'Neill

1 A. He did on age. He had, I think, seven
 2 variables that he found significant on age.

3 Q. Do you know what the other variables were?

4 A. I can see them in a chart, but I can't --
 5 somehow or another, they are out of focus.

6 Q. That is fine.

7 A. Yes, I probably shouldn't guess at them.

8 Q. Okay. Then in paragraph 33, you state,
 9 "Although it is very difficult to measure teacher
 10 effectiveness quantifiably," what do you mean by that?

11 A. We don't have a measure to -- such as an
 12 achievement test that we can measure a teacher
 13 effectiveness of a teacher. The only instruments we
 14 have are evaluation reports by principals and
 15 administrators.

16 Q. And then you say, "Perception studies of
 17 teachers." What are perception studies?

18 A. They are studies that seek to identify the
 19 perceptions that people hold about certain conditions
 20 or beliefs or things like that. Some people might
 21 suggest they are belief studies. Do you believe this
 22 or do you believe that.

23 Q. The very last sentence before we start
 24 paragraph 34, "Such ethnograph studies."

25 A. Yes.

1 Q. What is that?

2 A. Yes. Ethnograph naturalistic studies that
3 gather data by asking questions rather than using data
4 such as achievement scores or just other discrete
5 indices like that.

6 Q. Are there problems with these ethnographic
7 studies such as bias in the questions?

8 MR. ELIASBERG: Objection. Vague. Calls
9 for speculation and lacks foundation.

10 THE WITNESS: Researchers who use
11 naturalistic or ethnographic methodology attempt to
12 control for that by various measures.

13 MS. GIORGI: Q. What kind of measures?

14 A. If a researcher develops an instrument, he
15 or she will submit it to a panel of experts for their
16 input and then revise the instrument based upon that
17 kind of input. Further, a researcher may do some
18 statistical analysis on making certain that the items
19 are relevant to what they want to factor analysis.

20 Q. Would that be to -- utilizing that
21 procedure, would the researcher, I'd say, do a test run
22 of this instrument and then use that data for the
23 statistical analysis?

24 A. Yes.

25 MR. ELIASBERG: Objection. Calls for

1 studies are.

2 Q. Could you describe the methodology generally
3 used?

4 MR. ELIASBERG: I'm sorry. The methodology
5 of the studies generally or to subject them to some
6 kind of validation?

7 MS. GIORGI: Perception studies validation
8 methodology.

9 THE WITNESS: I may not understand the
10 question. I thought that validation did address that.

11 MS. GIORGI: Q. Maybe I'm using a word
12 differently. A level of confidence, that is not the
13 same as validation?

14 A. No.

15 Q. Okay. How does a perception study test for
16 a level of confidence or does it?

17 MR. ELIASBERG: Objection. Compound.

18 THE WITNESS: It does not -- it is not
19 tested on that level.

20 MS. GIORGI: Q. How is it tested?

21 A. The results of an instrument is administered
22 to a group of people and replies are gotten back and
23 there are a number of computer programs that actually
24 does a synthesis of it. It is what we might call
25 thematic analysis. The researcher tries to identify

1 speculation.

2 MS. GIORGI: Q. Is that the procedure?

3 A. Yes, basically that is.

4 Q. Any other methods that a researcher would do
5 to control for bias in their questionnaire?

6 MR. ELIASBERG: Objection. Assumes facts.

7 THE WITNESS: I couldn't -- I don't think
8 that -- I think those are sufficient.

9 MS. GIORGI: Q. Paragraph 34, you identify
10 Lowe, 1990 study. Do you recall that study?

11 A. Yes.

12 Q. And was that study published?

13 A. Yes.

14 Q. And was it subject to peer review?

15 A. Yes.

16 Q. Was it a doctoral peer review?

17 A. Yes.

18 Q. Do you recall the methodology that Lowe
19 used?

20 A. Lowe developed an instrument, teacher
21 perception instrument designed to elicit beliefs,
22 concerns, certain aspects of the work environment.

23 Q. Are perception studies subject to a
24 statistical validation or --

25 A. Not in the same method that correlation

1 main themes or recurring themes that show up in all of
2 the data, but the verbal data are entered into the
3 computer and there is programs. Ask Sam is one
4 program, but there are others, so it is recording what
5 a group of people say or express.

6 Q. In putting together a perception study, does
7 the research identify the pool of people he is going to
8 survey?

9 A. Yes.

10 Q. And is that required to be randomly
11 selected?

12 A. It is not required. Each researcher has to
13 decide how and who he is going to assess and if I
14 wanted to find out the perceptions of the faculty at
15 main street elementary school, then I would go and use
16 that population, all the teachers.

17 Q. Are there any controls in a perception study
18 that make sure the participant is answering truthfully
19 on the questionnaire?

20 MR. ELIASBERG: Objection. May call for
21 speculation.

22 THE WITNESS: I think every researcher
23 understands that people answer a question according to
24 what they think, what they believe, and that then has
25 to be a truthful answer.

1 MS. GIORGI: Q. Are there any studies
2 regarding this relationship between a truthful answer
3 and what people answer on a survey?
4 A. I couldn't answer that.
5 Q. I'm going to move on, then, to paragraph 35.
6 Cochran, Walker and White, 1988.
7 A. Yes.
8 Q. Are you familiar with this study?
9 A. I have read it.
10 Q. Do you know if it was published?
11 A. Yes.
12 Q. And was it subject to peer review, a
13 doctoral?
14 A. No.
15 Q. The other?
16 A. It was by editorial referee. It is really a
17 referee journal. It is called a referee journal which
18 means that when an article is received by a publisher,
19 the publisher sends it out to people that are
20 knowledgeable of the field and they comment on it and
21 say should they publish it or not and that is peer
22 review, but it is different.
23 Q. How do you determine if a journal is a
24 referee journal or not?
25 A. You have to find out what their policies

1 are. There are journals that do not practice
2 refereeing articles and then there are those that do
3 practice it.
4 Q. Your North Dakota study was published,
5 correct?
6 A. Yes.
7 Q. Was that in a referee journal?
8 A. Yes.
9 Q. Are you familiar with the methodology of
10 Cochran, Walker and White? You utilized them in your
11 study.
12 A. Yes.
13 Q. What was that? What methodology did they
14 use to conduct their study?
15 A. They used basically the same ethnographic or
16 naturalistic methodology that others used. They
17 assessed the teachers in five different cities, urban
18 areas, and developed an instrument to obtain responses
19 relative to working conditions.
20 Q. And then with Dawson and Parker, 1998, that
21 is paragraph 36. Are you familiar with that study?
22 A. I have read it.
23 Q. And was this study published?
24 A. Yes.
25 Q. Was it in a referee journal?

1 A. Yes.
2 Q. And therefore, it was subject to peer
3 review?
4 A. Yes.
5 Q. And the methodology used by Dawson and
6 Parker, could you describe that?
7 A. Basic naturalistic inquiry that they ask --
8 they develop a series of questions to ask teachers
9 their perceptions of process of renovation and how they
10 felt about certain conditions.
11 Q. Then in paragraph 37, you state, "The
12 studies cited above have amply documented the fact that
13 poor schools do reduce the effectiveness of teachers."
14 Which one of those studies established the
15 teacher's effectiveness was reduced?
16 A. I think all of them said something to that
17 effect in their conclusions.
18 Q. And how was the effectiveness of the
19 teachers measured?
20 A. Their perception of effectiveness.
21 Q. So it is the teachers themselves?
22 A. Yes.
23 Q. Was there any control group like the
24 principals surveyed to also assess their perception of
25 the teachers' effectiveness?

1 MR. ELIASBERG: Objection. Compound and
2 ambiguous.
3 THE WITNESS: That wouldn't be the case. If
4 a researcher wants to find out perceptions of an
5 individual or a group of individuals, the researcher
6 will ask that group the questions that they want to
7 ask.
8 MS. GIORGI: Q. Was there any cross
9 checking with the students' achievement on tests with
10 the teachers' perceptions of reduced effectiveness?
11 A. Student achievement scores were not entered
12 into these studies.
13 Q. Then furtherance of that sentence that I
14 previously read, it says, "And subsequently have a
15 negative influence upon the ability of the students to
16 learn."
17 That determination of a negative influence,
18 was that the teacher's own assessment?
19 A. Yes.
20 Q. Were there any other assessments to validate
21 the teacher's perception that it was a negative
22 influence on the ability of the students to learn?
23 A. No, there was no need to.
24 Q. Now, on paragraph 38, and in the second
25 sentence, you say, referring to overcrowding, "The

1 result is very troublesome for both the students and
2 the teachers."

3 What do you mean by that?

4 A. That overcrowding is bothersome to teachers
5 and students.

6 Q. And what do you mean by "Bothersome"?

7 A. In some of the reports, overcrowded
8 buildings cause a teacher to, in their perception, work
9 less effectively, less efficiently than they could if
10 they were in buildings where they did not experience
11 overcrowded conditions.

12 Q. On paragraph 39, you state, "Although there
13 are not as many research studies on the effect
14 overcrowding has on student learning as there are with
15 other physical environmental factors."

16 My question is, what is your threshold on
17 the number of research studies you believe need to be
18 performed before you believe it is appropriate to make
19 generalizations?

20 A. I'm sorry. I didn't hear the last.

21 Q. When do you think it would be appropriate to
22 make generalizations based on those studies?

23 MR. ELIASBERG: Objection. Compound.

24 THE WITNESS: That would be very difficult
25 to answer because the introduction of generalization

1 Q. Do you recall that?

2 A. Yes.

3 Q. Was that study published?

4 A. Yes.

5 Q. And was it published in a referee journal?

6 A. Yes, it was.

7 Q. And was this also a perception-based study?

8 A. Yes, it was.

9 Q. Was this a randomly selected teacher
10 population --

11 A. No.

12 Q. -- for this study?

13 A. I should say, though, that the purpose of
14 the study was to look at overcrowding as well as
15 building conditions and teachers' perception of that in
16 urban areas. That was the intent of the study and
17 therefore it was conducted in five city schools.

18 Q. So the purpose of the study limited the
19 researcher's choice of his population to study?

20 MR. ELIASBERG: Objection. Misstates prior
21 testimony.

22 MS. GIORGI: Q. Is that correct?

23 A. I would state it a different way.

24 Q. How would you state it?

25 A. The researcher wanted to find out what

1 beyond a study implies many more constraints, many more
2 processes than sheer numbers of studies and I don't
3 think I can give you an adequate answer to your
4 question on that.

5 MS. GIORGI: Q. Okay. You said there
6 weren't that many research studies in the area of
7 overcrowding. Nevertheless, the available research
8 shows overcrowding causes a variety of problems. Is
9 that not a generalization from the research studies
10 that you did review?

11 A. The reason I said that there are not many
12 studies in overcrowding is because theoretically,
13 overcrowding ought to be a temporary condition and as
14 such, it is very, very difficult to mount a study that
15 would assess the effect of overcrowding. In most
16 cases, I'll say that. It is when overcrowding becomes
17 a long-term effect that you can do that and very, very
18 few school systems permit overcrowding over a long
19 period of time.

20 Q. How do you define overcrowding?

21 A. A greater number of students in the building
22 than the building was designed for.

23 Q. Okay. You refer to the Cochran, et al.,
24 1988 report or study?

25 A. Yes.

1 teachers in urban areas thought of their working
2 conditions. Because that was the purpose of the study,
3 then that rather helped him select the population, so
4 that he chose these five near five large areas, large
5 cities, as a population.

6 Q. Then in paragraph 40, you identify another
7 study, Fernandez and Timpane?

8 A. Yes.

9 Q. Are you familiar with that study?

10 A. Yes.

11 Q. How are you familiar with it?

12 A. I have read it.

13 Q. Was that also a perception-based study?

14 A. Yes. And I have to qualify that because it
15 really was a report on overcrowded conditions and if my
16 memory serves me, they did not do -- formulate an
17 actual instrument to gather perceptions, but they did
18 survey teachers and used -- data was provided by the
19 school system.

20 Q. Then the next study Rivera-Batiz and
21 Martini, 1995. Are you familiar with that study?

22 A. Yes, I am.

23 MR. ELIASBERG: Just for clarity, it is
24 actually Rivera-Batiz and Marti. It is M-a-r-t-i, not
25 M-a-r-t-i-n-i.

1 MS. GIORGI: Q. In this study, they
 2 surveyed 599 students and 213 teachers in overcrowded
 3 schools.
 4 A. Yes.
 5 Q. Do you recall whether or not that was a
 6 random selected student and teacher population?
 7 A. No, it -- I'm sorry. It was selected
 8 purposefully, a purposeful selection of those schools
 9 that were overcrowded.
 10 Q. How did they define schools that were
 11 overcrowded? How did they define their population?
 12 A. The city school system lists those schools
 13 that are considered overcrowded and, again, their
 14 criteria is more students than the building was
 15 designed for.
 16 Q. Once they had those schools identified, what
 17 was the next step in their methodology?
 18 A. They developed an instrument to gain
 19 perceptions of students and teachers.
 20 Q. Do you know if this instrument was mailed to
 21 the students or if -- how did they effectuate the
 22 gathering of the data from the surveys?
 23 A. I can't answer that for certainty.
 24 Q. The Rivera-Batiz and Marti study did a
 25 comparison with student achievement, correct?

1 A. Yes.
 2 Q. Could you explain to me what they did?
 3 A. They divided -- they identified the
 4 overcrowded schools, high schools or schools and they
 5 then identified those overcrowded schools that are
 6 low -- had high percentage of low socioeconomic
 7 students and the other group had a high percentage of
 8 high socioeconomic students, so they basically did two
 9 studies or two populations.
 10 Q. And what was the outcome of their study in
 11 the comparison of the two economic groups?
 12 MR. ELIASBERG: Objection. Misstates the
 13 witness's prior testimony. You can go ahead and
 14 answer.
 15 THE WITNESS: The low socioeconomic or the
 16 schools with high proportionate low socioeconomic
 17 students was divided into two groups and that is how
 18 she found -- how they found that there was a difference
 19 in scores between those two groups of noncrowded,
 20 overcrowded schools and overcrowded schools with high
 21 socioeconomic status.
 22 MS. GIORGI: Q. Did this study determine
 23 what degree to which overcrowding affects learning?
 24 MR. ELIASBERG: Objection. Vague and
 25 ambiguous.

1 THE WITNESS: I don't understand the
 2 question.
 3 MS. GIORGI: Q. We'll go on to the next
 4 study, Finn and Archils, 1999 in paragraph 43. Was
 5 this a published study?
 6 A. Yes.
 7 Q. And was it published in a referenced
 8 journal?
 9 A. Yes.
 10 Q. Subject to peer review?
 11 A. Uh-huh.
 12 MR. ELIASBERG: Did you mean a referee
 13 journal, not a reference journal?
 14 MS. GIORGI: Yes.
 15 THE WITNESS: Referee.
 16 MS. GIORGI: Q. And this study was randomly
 17 conducted; is that correct?
 18 A. They -- the study was done on the schools
 19 that were selected to be in this total program and they
 20 divided it up into three groups.
 21 Q. What was the focus of this study?
 22 A. To try and determine the effect small class
 23 size had upon student achievement.
 24 Q. Did the authors of this study then apply
 25 their research to the situation of overcrowded schools?

1 A. No, they did not.
 2 Q. Is the application of the findings of their
 3 study as applied to overcrowded schools your opinion?
 4 A. The reason that this study was put in there
 5 was -- to serve as kind of a contrast to the
 6 overcrowded -- the studies on overcrowded conditions
 7 and I think it is kind of a contrast to say that
 8 control of classroom size is very important to the
 9 success of students.
 10 Q. Are you aware of any class size reduction
 11 studies that find that there is no impact on student
 12 achievement?
 13 A. I have not read any.
 14 Q. Are you aware that some may exist?
 15 A. Yes.
 16 Q. And why have you not read them?
 17 A. They really don't fit into my area of
 18 interest and concern.
 19 Q. Okay. Do you have an opinion as to whether
 20 class size reduction or teacher -- strike that.
 21 Do you have an opinion of which of these two
 22 variables has a more significant impact on student
 23 achievement, class size reduction or teacher quality?
 24 MR. ELIASBERG: Objection. Vague as to
 25 "teacher quality" and may be beyond the area of the

1 witness's expertise.

2 THE WITNESS: I have no basis for answering
3 that, sorry.

4 MS. GIORGI: Q. Okay. Have you ever done a
5 comparison of what I call these confounding variables
6 and their relative impact on student achievement?

7 A. No.

8 Q. In looking at the building conditions, do
9 you have an opinion on whether paint, the color of the
10 walls, has a more significant impact on student
11 achievement than the temperature?

12 A. Yes.

13 Q. And what is your opinion?

14 MS. MITCHELL: Lacks foundation.

15 THE WITNESS: Based upon Jim Lanham's study,
16 he found that after controlling for the SES, that the
17 most important variable was air-conditioned buildings.

18 MS. GIORGI: Q. Okay. Did he also control
19 for the amount of books in the library?

20 A. No.

21 Q. Do you have an opinion on which is a better
22 predictor of child -- children's academic success, the
23 number of books in the library or air-conditioning?

24 MS. MITCHELL: Lacks foundation.

25 THE WITNESS: I really couldn't answer that.

1 influence and how can that be accurately measured."

2 MR. ELIASBERG: I'm sorry. Can you tell me
3 where that was?

4 MS. GIORGI: Page 2.

5 MR. ELIASBERG: There are sort of looks like
6 something that came to a Bates page and also an
7 original page. I'm just confused as to which.

8 MS. GIORGI: I don't -- that is different.

9 Strike that last question.

10 MR. ELIASBERG: You are now working off what
11 we have as Earthman 8?

12 MS. GIORGI: Yes.

13 Q. The third paragraph, first sentence, you
14 identify, "Perhaps the major limitation on this type of
15 research is determining the degree to which school
16 facilities could be the actual cause of student
17 behavior and achievement."

18 A. I'm sorry. I didn't --

19 Q. It is on page 1, the third paragraph, first
20 sentence.

21 A. Yes.

22 Q. What did you mean by that?

23 A. It is very difficult to find out the degree
24 to which school facilities can have an influence upon
25 student achievement behavior. But it also says, in

1 MS. GIORGI: One more report. I believe
2 this is Exhibit Earthman 8.

3
4 (Whereupon, Defendants' Exhibit 8 was marked
5 for identification.)

6 MS. GIORGI: Q. Dr. Earthman, do you
7 recognize this document?

8 A. Yes, I do.

9 Q. And what is this?

10 A. It is a -- was a presentation at the counsel
11 on educational facility planners.

12 Q. And did you prepare this document?

13 A. Yes, I did.

14 Q. And did you have any assistance in preparing
15 this document?

16 A. Linda Lemasters did assist me. It was a
17 collaborative affair.

18 Q. And what was the purpose of this
19 presentation?

20 A. The purpose of the presentation was to
21 inform the people who were attending the conference of
22 recent research summarizations on building condition
23 and student achievement.

24 Q. In the first paragraph, last sentence, you
25 said, "The big question, however, is the degree of

1 essence, that there is an influence. It is the degree
2 that might be questionable.

3 Q. And why is it hard to measure the degree of
4 the impact?

5 A. One very important limitation is the lack of
6 longitudinal studies. The degree of this influence we
7 capture in one like photograph. Now, if a child is in
8 a poor building for a number of years, is there a
9 cumulative effect on that? That is difficult to find
10 out. We haven't been able to yet.

11 Q. And you haven't or no one has done a
12 longitudinal study and that is why you don't know?

13 A. That is right. We were talking about degree
14 of influence.

15 Q. There is a statement you made on page 12 of
16 this document, Exhibit 8, and it is just before the
17 bold heading, so it would be the last sentence in
18 paragraph four. Spending -- the Bates stamp number of
19 the page is 0635. And there is a page 14 and a page 12
20 stamped on it.

21 A. Okay.

22 Q. The fourth paragraph, last sentence, it
23 states, "Spending funds to improve the built
24 environment will produce greater results than funds
25 spent on materials, textbooks, and even teachers."

1 Could you explain that statement?
 2 A. That is my personal belief.
 3 Q. And what is it based upon?
 4 A. It is really based upon the body of research
 5 we reviewed in this paper.
 6 Q. Have you done any economic analysis of the
 7 amount of funds spent on materials or textbooks and
 8 teachers and compared that to the expenditures spent on
 9 built environment?
 10 A. No, I have not.
 11 Q. Then what did you mean, again, by this
 12 sentence? I know you said it was your personal
 13 opinion. Maybe could you elaborate a little bit more
 14 for me.
 15 A. If a principal of a school that is -- the
 16 building is not in good condition, if that principal
 17 were able to obtain a sizable sum of money, the
 18 principal might have a choice on what to spend it upon
 19 and based upon my readings, why, maybe more teachers
 20 won't really produce any better results and the
 21 purchase of more textbooks or newer materials, in my
 22 reading, doesn't really produce outstanding results,
 23 but if that principal were to spend it in upgrading his
 24 or her building by either putting in air-conditioning
 25 or new lighting or any of these other variables that we

1 and build school buildings and I believe it was their
 2 intent to make an assessment as to are they getting
 3 their money's worth out of the money that we've spent
 4 on school buildings and school systems.
 5 Q. At the very last of page 2 to page 3, you
 6 discuss a problem that is inherent in this area of
 7 research, which is the lack of predictability on the
 8 results. Could you explain this further?
 9 A. Predictability infers generalization to a
 10 larger population and the studies that were -- that I
 11 cited in this document are not predictive studies.
 12 They are correlational studies which do not address
 13 predictability.
 14 Q. Can you use a correlative study for
 15 predictability?
 16 A. No.
 17 Q. And why not?
 18 A. Because it cannot be generalized beyond the
 19 population that it has.
 20 Q. And why is that?
 21 A. Well, in school facility's research, it is
 22 extremely difficult to get a large enough population
 23 throughout, say, the country to actually do any
 24 generalization and then you also have the problem of
 25 pretesting, posttesting so that you can then be able to

1 have found in this research, I think that principal
 2 would then ensure that a student has a good physical
 3 environment within which to learn.
 4 MS. GIORGI: Okay. Now I'm going to go back
 5 to Exhibit 9. I must not have this document. If
 6 you'll work with me a second. Let me check.
 7 MR. ELIASBERG: Why don't we take just a
 8 very brief break while you are looking.
 9 MS. GIORGI: Okay.
 10 (Recess taken.)
 11
 12 (Whereupon, Defendants' Exhibit 9 was marked
 13 for identification.)
 14 MS. GIORGI: Q. In front of you, Dr.
 15 Earthman, is Earthman Exhibit 9.
 16 A. Yes.
 17 Q. Do you recognize this document?
 18 A. Yes.
 19 Q. And what is this?
 20 A. This was a presentation at the European
 21 Investment Bank at a conference that they had dealing
 22 with the appraisal of educational investments.
 23 Q. What does educational investments mean?
 24 A. The European Investment Bank provides
 25 developing countries with funds to establish schools

1 predict.
 2 Q. What do you mean by pretest and posttest?
 3 A. You test subjects before the treatment and
 4 the treatment is being in --
 5 Q. A school?
 6 A. -- a poor building, right, and that is
 7 impossible to do in the first place ethically, morally,
 8 and legally. I assume legally.
 9 Q. Why do you say ethically and morally?
 10 A. I personally would be hard pressed to say
 11 this group of students goes into a poor building and
 12 this group of students goes into a modern building,
 13 functional building. Just would be, I think, ethically
 14 wrong for the researcher to suggest that.
 15 Q. On page 4 of Earthman 9, I believe it is the
 16 second sentence in the second paragraph. It states,
 17 "So often, however, a significant relationship is
 18 difficult to statistically demonstrate."
 19 Could you explain to me what you meant by
 20 that?
 21 A. A significant relationship has to have a
 22 certain amount of difference in order for it to be
 23 significant and it is difficult to come upon this. It
 24 just doesn't happen by chance. A real difference has
 25 to be in existence for it to be statistically

1 significant at some level of confidence.
 2 Q. When you wrote that, were you thinking of a
 3 .05 significance?
 4 A. Yes, or there are others, yes.
 5 Q. What do you mean, "There are others"?
 6 A. There is a .01 and a .001 level of
 7 confidence. .05 is used very generally.
 8 MS. GIORGI: We'll go off just a minute to
 9 make sure I'm done. Check my notes.
 10 (Recess taken.)
 11 MS. GIORGI: Okay. I do have one area.
 12 Q. In most of the studies that we've discussed
 13 regarding student achievement, they were measured by
 14 statewide tests; is that correct?
 15 A. Yes.
 16 Q. Or standardized tests?
 17 A. Yes.
 18 MS. GIORGI: Okay. Nothing further on that.
 19 I'm ready to conclude, but for various
 20 reports that I don't have. I still would like to go
 21 over your research with you once I obtain it, as well
 22 as the Ritz, Babi, and Marti which I have not been able
 23 to obtain and the Ayers report, which I've not been
 24 able to obtain.
 25 THE WITNESS: I should say something. I

1 expressed an opinion about expenditure of money and I
 2 do believe that there is some validity to it, but like
 3 some opinions, I can generalize far beyond the
 4 circumstances. There are schools that are very poor
 5 that have neither the proper teacher complement,
 6 materials, or support that -- and obviously it would be
 7 unwise to pour money into facilities if you did not
 8 have sufficient teachers, right kind of teachers, or
 9 that every child didn't have a textbook, so my frame of
 10 reference in making that opinion was very narrow. One,
 11 that assuming that they had a good complement of
 12 teachers; they have materials; they have textbooks.
 13 Now, the thing that I would say is spend the money on
 14 the physical environment.
 15 MS. GIORGI: Q. Okay. Did you discuss this
 16 revision to your statement with your attorney or with
 17 Mr. Eliasberg?
 18 MR. ELIASBERG: Objection to the extent it
 19 was a revision of his testimony. You can answer the
 20 question.
 21 THE WITNESS: It was mentioned, yes.
 22 MS. GIORGI: Q. Did he mention it to you?
 23 A. Yes.
 24 Q. And did he suggest to you an answer?
 25 A. No.

1 Q. Did he suggest certain things that you
 2 should have thought about?
 3 A. No.
 4 Q. How did it come up in your conversation?
 5 A. He said, "Are you certain that this is a
 6 proper statement because there might be some
 7 extenuating circumstances."
 8 Q. And by "Extenuating circumstances," did he
 9 expand upon what he meant by "Extenuating
 10 circumstances"?
 11 A. Such as teachers that might not be prepared
 12 and lack of textbooks.
 13 Q. And he explained that to you?
 14 A. He raised that question.
 15 Q. And what was your response to that?
 16 A. Yes, I had blinders on.
 17 Q. Okay. And this Exhibit No. 9, on page 20,
 18 the very last sentence on the page, you also state,
 19 "Spending funds to improve the built environment might
 20 produce greater student performance results than funds
 21 spent on instructional materials, textbooks, and even
 22 teachers."
 23 So in light of what you just said, I'm
 24 uncertain what you meant by "Funds spent on
 25 instructional materials, textbooks and even teachers."

1 A. Assuming that a school has proper complement
 2 of teachers, has sufficient materials, textbooks, and
 3 they are not -- they don't have all of the components
 4 necessary for good environment, then it would behoove
 5 the principal to improve the physical environment.
 6 Q. So is it your opinion that a principal
 7 should first spend the monies he has on instructional
 8 materials and teachers before he spends the money on
 9 the physical environment?
 10 MR. ELIASBERG: Objection. Misstates
 11 testimony.
 12 MS. GIORGI: I'm asking his opinion.
 13 THE WITNESS: I would be hard pressed to
 14 answer that because there are some confounding
 15 variables in that.
 16 MS. GIORGI: Q. When you wrote this
 17 sentence, and you are saying now you assume that they
 18 have a full complement of instructional materials and
 19 teachers, why would they need to spend more money on
 20 them?
 21 MR. ELIASBERG: Objection. Misstates the
 22 witness's testimony and compound question.
 23 THE WITNESS: I couldn't answer that
 24 question.
 25 MS. GIORGI: Q. If the built environment is

1 an excellent school -- I'm trying to remember what you
2 called the good schools -- the not poor schools, would
3 the spending of funds to improve the built environment
4 produce greater results -- produce greater student
5 performance results than funds spent on instructional
6 materials, textbooks, and even teachers?

7 MR. ELIASBERG: Objection. Calls for
8 speculation. Lacks foundation.

9 THE WITNESS: That would be hard to answer
10 because first of all, it requires some knowledge that I
11 don't have on teacher effectiveness and material
12 effectiveness.

13 MS. GIORGI: Okay. As I said before, I am
14 awaiting for those additional reports and then we can
15 reschedule this.

16 MR. ELIASBERG: We will -- I'll put on the
17 record that the reports you named, I believe all of
18 them except the Ayers report, are publicly available
19 and as a result, the judge's October 24th order only
20 said we had to list them for you, which we did. We
21 don't have to produce them. As a courtesy, we will
22 produce an article about his North Dakota study, but we
23 don't believe we're required to do that under the rules
24 or under the judge's October 24th order because it is
25 publicly available. That was found in a five-minute

1 CERTIFICATE OF REPORTER

2 I, JOHNNA PIPER, a Certified Shorthand
3 Reporter, hereby certify that the witness in the
4 foregoing deposition was by me duly sworn to tell the
5 truth, the whole truth and nothing but the truth in the
6 within-entitled cause;

7 That said deposition was taken down in
8 shorthand by me, a disinterested person, at the time
9 and place therein stated, and that the testimony of the
10 said witness was thereafter reduced to typewriting, by
11 computer, under my direction and supervision;

12 I further certify that I am not of counsel
13 or attorney for either or any of the parties to the
14 said deposition nor in any way interested in the event
15 of this cause and that I am not related to any of the
16 parties thereto.

17
18 DATED: _____, 2003.

19
20
21 _____
22 JOHNNA PIPER, CSR 11268
23
24
25

1 Google search.

2 MS. GIORGI: Then I may ask some more
3 questions tomorrow.

4 THE WITNESS: Fine. Thank you.

5
6 (Whereupon, the deposition was adjourned
7 at 4:38 p.m.)

8 --o0o--
9

10 I declare under penalty of perjury that the
11 foregoing is true and correct. Subscribed at
12 _____, California, this ____ day of
13 _____, 2003.

14
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17 _____
18 DR. GLEN EARTHMAN
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