

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF PENNSYLVANIA

TAMMY KITZMILLER, et al :
 :
 : CASE NO.
 v. : 4:04-CR-002688
 :
 :
 DOVER AREA SCHOOL DISTRICT, :
 et al :
 :

TRANSCRIPT OF PROCEEDINGS
BENCH TRIAL

MORNING SESSION

BEFORE: HON. JOHN E. JONES, III

DATE : October 17, 2005
9:00 a.m.

PLACE : Courtroom No. 2, 9th Floor
Federal Building
Harrisburg, Pennsylvania

BY : Wendy C. Yinger, RPR
U.S. Official Court Reporter

APPEARANCES:

ERIC J. ROTHSCHILD, ESQUIRE
WITOLD J. WALCZAK, ESQUIRE
STEPHEN G. HARVEY, ESQUIRE
RICHARD B. KATSKEE, ESQUIRE
THOMAS SCHMIDT, ESQUIRE
For the Plaintiffs

PATRICK T. GILLEN, ESQUIRE
RICHARD THOMPSON, ESQUIRE
ROBERT J. MUISE, ESQUIRE
For the Defendants

I N D E X T O W I T N E S S E S

<u>FOR THE PLAINTIFFS</u>	<u>DIRECT</u>	<u>CROSS</u>	<u>REDIRECT</u>	<u>RECROSS</u>
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Michael Behe (on qualifications)

By Mr. Muise 20

By Mr. Rothschild --

Michael Behe

By Mr. Muise 85

1 THE COURT: All right. Good morning to all.
2 We have some exhibits to take before we get into our
3 first witness. So let's take -- what's your pleasure?
4 What do you want to take first from the Plaintiffs?

5 MR. HARVEY: Mr. Stough's exhibits.

6 THE COURT: All right. I have -- it looks
7 like, predominantly, we have, I'm not sure that I should
8 or want to read all of them, but they look like news
9 articles that are not going to be admitted yet, at least
10 at this point. The non-news articles, so to speak,
11 would be.

12 MR. HARVEY: Letters to the editor.

13 THE COURT: P-671 would be -- that's
14 correct, the letters to the editor chart. The affidavit
15 is 670. 674, again, I think, is the chart. 672 is the
16 chart. 675 is the chart.

17 MR. HARVEY: Just to be clear, Your Honor,
18 those exhibits were the editorials and the letters
19 themselves with the chart.

20 THE COURT: With the chart, that's correct.
21 And P-702 was the letter that the witness received. I
22 think all the other exhibits were articles themselves.
23 Tell me if I'm wrong.

24 MR. HARVEY: You're correct, Your Honor,
25 with the exception of two article exhibits that were

1 already admitted.

2 THE COURT: All right. So are you moving
3 for the admission of the exhibits that I recited?

4 MR. HARVEY: Yes, Your Honor.

5 MR. GILLEN: Your Honor, we object. We
6 object to the -- it looks to me like we object to
7 everything except the affidavit prepared by Mrs. Aryani,
8 which is, I believe, 670.

9 THE COURT: That would be 670. And I think
10 you interposed objections -- I understand the gist of
11 your objections having had those placed on the record at
12 the time those exhibits were referred to. All right.

13 Well, 670, the affidavit, will be admitted.
14 P-702, I'll hear argument on that, but I would not be
15 inclined to admit 702. But if you want to make
16 additional argument, you can.

17 MR. HARVEY: Your Honor, I have nothing
18 further to say.

19 THE COURT: All right, I'm not going to
20 admit 702, which is a letter by an unknown author,
21 handwriting on it is unreliable, and he testified about
22 the receipt of the letter, and I think that was
23 sufficient. But I don't believe the letter itself
24 should be admitted.

25 Now, Mr. Harvey, what do you want to say

1 about the other exhibits? They would be 671, 674, 672,
2 and 675, all of them being letters to the editor and/or
3 editorials and the chart? The charts, I would certainly
4 be inclined to admit.

5 I understand the objection, but I don't
6 think the chart, as being summaries of the contents, are
7 objectionable, so I'll admit the chart so you can focus
8 your argument on the letters themselves and the
9 editorials.

10 MR. HARVEY: It's simply that they come in
11 on the effect test. They're probative on that issue.
12 The Supreme Court in the Epperson case considered
13 letters to the editor. So this is -- they're certainly
14 relevant. They're probative. They're not unduly
15 prejudicial. They're authentic. They cover the time
16 period, June 2004 to September 2005, so that the
17 relevant time period. They should come into evidence.
18 And they're not offered for the truth of the matter
19 asserted, of course. They're offered for the effects
20 test, so there's no hearsay issue either.

21 MR. GILLEN: Your Honor, I do think I have a
22 little more to offer you by way of value here. I
23 thought all weekend about our colloquy on Friday. I
24 want to suggest, this is why the request for admissions
25 is erroneous and why the question that you posed on

1 Friday is addressed in the law and doesn't require
2 admission into evidence.

3 First, I want to suggest that what's being
4 offered to you here is a flawed chain of reasoning, and
5 it runs as follows: Mr. Stough has no personal
6 knowledge, but he read the articles, which are hearsay.
7 Based on that hearsay, he formed a belief, a state of
8 mind that Dover Area School District was advancing
9 religion. Based on that hearsay in his state of mind,
10 his state of mind is now being offered with the support
11 of these articles to prove the fact he believes that
12 Dover Area School District was advancing religion.

13 For the reasons I've stated, I believe that
14 that cannot happen under the Federal Rules of Evidence.
15 But on Friday, Judge, you asked me a good question that
16 I've thought about. It is this. You said, Mr. Gillen,
17 I think you set the bar too high. I think that he
18 doesn't have to attend the board meetings to be apprised
19 of the effect.

20 Your Honor, in thinking of that, I want to
21 suggest that the law and the way the law treats the test
22 that you have to apply in this case addresses your
23 concern without requiring the admission of this hearsay.
24 And this is why.

25 The test that you're asked to apply in this

1 case, if you believe the endorsement test applies -- we
2 say it doesn't. We say it doesn't get outside the
3 classroom. But if you so hold, then the test asks you
4 to find what a reasonable observer would believe. Now,
5 Judge, when the law asks you to make that determination,
6 there is no necessary connection between the actual
7 knowledge of a given Plaintiff and the knowledge that
8 the law imputes to the objective reasonably informed
9 observer for the purpose of the test.

10 Let me give you two brief examples that
11 demonstrate this is the way the law treats it and this
12 is why the problem that you see isn't a problem that
13 comes from the evidence. Just take a display case right
14 up there in the State Capitol. There's a cross. A
15 Plaintiff could see that cross and believe that the
16 State is advancing religion.

17 THE COURT: Well, that's why the endorsement
18 test is used for displays such as the Ten Commandments.

19 MR. GILLEN: Exactly. Now, Judge, look at
20 the outcome of such a case. If that Plaintiff comes in
21 and brings a claim, there's two different outcomes. It
22 could succeed or fail. But my point to you, Your Honor,
23 is, it could succeed or fail based on knowledge or facts
24 in evidence that were utterly unconnected to the actual
25 knowledge of the Plaintiff.

1 In one case, the claim could fail, because
2 the evidence of record, the facts of the matter could
3 demonstrate that, although the Plaintiff didn't know it,
4 the reality is, it's a forum.

5 THE COURT: Well, you argue the endorsement
6 test, and I might agree with you on the endorsement
7 test. I understand your point exactly. But I think
8 what Mr. Harvey argues is that, and the courts have done
9 this, as you know, they've done alternative analysis.
10 They've done it under purpose and effect, and then
11 they've interposed endorsement in case, I suppose,
12 appellate courts want to see it done both ways.

13 I might agree with you that, if we do it on
14 an endorsement analysis, admission is problematic. Now
15 Mr. Harvey says, they get admitted on the effect test,
16 the straight effect test. What I grapple with on the
17 effect test, I all tell you all rather candidly, is
18 effect upon whom? And I have yet to decide that,
19 obviously. You would say, I think, Mr. Harvey, that
20 it's broader than simply the 9th grade students. I
21 think you would say not. Is that --

22 MR. GILLEN: Correct, Judge. The effect of
23 a curriculum change is the effect on the instruction in
24 the classroom.

25 MR. HARVEY: Regardless, Your Honor, it's

1 the reasonable observer in the community, whether it's
2 the 9th grade student or somebody else. And --

3 THE COURT: Well, but are we sure about
4 that? You say that for the effect test, but admittedly,
5 courts have done it both ways. Some courts have limited
6 it to the recipients or the direct recipients of the
7 policy, being the 9th grade students. You cast it in a
8 conjunctive sense.

9 Other courts have said, no, it's limited to
10 the intended recipients, being the 9th grade students.
11 In that case, of course, the testimony doesn't come in
12 on the effect test in any event; so no harm, no foul,
13 from your perspective.

14 MR. GILLEN: Correct, Your Honor.

15 MR. HARVEY: Your Honor, I believe the
16 courts have looked at the reasonable observers in both
17 contexts and have discussed these --

18 THE COURT: In both the endorsement and the
19 effect?

20 MR. HARVEY: Yes, and looked at the effect
21 on the community, what message is being sent to the
22 community as perceived by this reasonable observer. And
23 the reasonable observer, whether it's a 9th grade
24 student or not, would read this note that's being handed
25 to me by my counsel -- no.

1 THE COURT: Always great to have co-counsel.

2 MR. HARVEY: Absolutely. Would certainly be
3 reading what's in the paper, the letters to the editor
4 and editorial. These are the local papers. I mean,
5 this is about as good as source as you can get.

6 THE COURT: But Mr. Gillen says, it's
7 hearsay, it hasn't been established, and why should the
8 reasonable observer be permitted to rely on something
9 that is not conceded to be true.

10 MR. HARVEY: Well, Your Honor, I guess we're
11 going to determine in this case whether that's true or
12 not. But nevertheless, that is what is out there in the
13 community. And another point is, it's not just what was
14 published in the classroom. This was published in the
15 entire community. So we have it put out there for the
16 entire community.

17 THE COURT: I understand that. And I think
18 you have evidence on that point to be sure, and in your
19 case, you've established that. But on these particular
20 areas, which would be editorials, you know -- and I'll
21 address this to you, Mr. Gillen. These are editorials,
22 these are opinion pieces. You say though, implicitly
23 they assume facts.

24 MR. GILLEN: Exactly, Your Honor. The
25 difference between these letters that were published in

1 the newspaper and 702, which is a deplorable thing to
2 send to someone, is a difference of degree not kind.
3 They're both just someone's opinion as to what's going
4 on and in a paper.

5 It is not evidence for this Court. They are
6 not here in front of you. All it is, is, on that, on
7 that sort of evidence, Judge, a man could be convicted
8 of something based on nothing more than what people
9 think and put in the paper. I mean, let me suggest that
10 the western legal tradition did not give up trial by
11 ordeal, trial by combat, trial by compurgation, so we
12 could have trial by press clipping. I mean, it's
13 just --

14 MR. HARVEY: Mr. Gillen apprehends this
15 fundamentally. He is continuing to assume that we're
16 offering these for the truth of the matter asserted to
17 prove the underlying facts. Let me be clear about that.
18 We have put in much evidence to prove the underlying
19 facts. We will put in additional evidence, including
20 the testimony of the reporters themselves, that these
21 things were said, that they actually happened. These
22 articles for this are not being offered for this
23 purpose.

24 THE COURT: Here's what I want to do. I'm
25 going to ask that -- I'm going to defer a ruling on 671,

1 674, 672, and 675. I believe that it's appropriate for
2 me to read, particularly the underlying documents, not
3 the charts. I saw the charts, but I didn't see the
4 underlying documents. I'll do that. And I would like
5 to ask Mr. Harvey, if you would do me the favor of
6 reminding me that we need to revisit that.

7 I know you're burdened with a lot. All
8 counsel are. But if you would allow me to circle back
9 after I've read those, and then I might take some
10 additional argument at that time. One of the
11 disadvantages I have is that I have not read the
12 contents.

13 And I will say, too, that I recognize, Mr.
14 Harvey, your argument that it doesn't go to the truth.
15 I think that's the argument that you need to make under
16 the circumstances. I understand Mr. Gillen's argument,
17 that it necessarily has to go to the truth.

18 One of the things that will happen between
19 now and perhaps the time that we revisit these is that
20 we're going to have testimony, I believe, from the
21 reporters that may tie up some of these ends, or may not
22 tie up some of the ends, as the case may be.

23 I think it's prudent to withhold ruling on
24 671, 674, 672, and 675. We will not admit 702. We will
25 admit 670. Now are there any other exhibits for that

1 witness that I missed, Mr. Harvey?

2 MR. HARVEY: No, Your Honor, just the
3 articles, and I understand you're withholding ruling on
4 those as well.

5 THE COURT: Right. So we'll not take those
6 at this time. I'll rely on you at a later point in time
7 also to indicate that you want to move for admission of
8 the articles, if you choose to do so, any or all of the
9 articles. All right. Now the -- for Padian, we have,
10 his CV is 292. Are you move for the admission of that?

11 MR. WALCZAK: Yes, Your Honor.

12 THE COURT: That's admitted, I assume
13 without objection, is that correct, Mr. Gillen? It's a
14 CV.

15 MR. GILLEN: It is. Actually, Mr. Muise
16 will speak to that.

17 MR. MUISE: There is no objection.

18 THE COURT: And the D-282 was referred to on
19 cross. That was the U.S. Office of Special Counsel
20 letter. What is your pleasure on that? Do you want to
21 do anything with that at this time?

22 MR. MUISE: Well, we would move for its
23 admission, Your Honor.

24 MR. WALCZAK: We would oppose, Your Honor.
25 It's hearsay. The document was not discussed in court.

1 We don't know about the authenticity. We don't know
2 whether it's reliable. We don't know whether it's
3 accurate. It was used to attempt to impeach the
4 witness, and he didn't have any knowledge. We would
5 object.

6 THE COURT: Mr. Muise.

7 MR. MUISE: Well, again, Your Honor, I think
8 for the purpose of what we want it for the contents of
9 that document, I mean, it was read into the record.

10 THE COURT: Well, I gave you latitude on it,
11 and I allowed part of it to be read into the record over
12 counsel's objection. But I would be reluctant to admit
13 the letter on the whole. I think Mr. Walczak's point is
14 well-taken. It is essentially a hearsay document.

15 MR. MUISE: Your Honor, at this point then,
16 we would like to reserve the admission of that until,
17 because we're actually pursuing the possibility of
18 getting a way to have that authenticated.

19 THE COURT: That's fine.

20 MR. MUISE: We'll reserve. We won't move
21 that right now. We'll reserve the admission of that
22 document until later.

23 THE COURT: That's fine. I'll certainly
24 give you the opportunity to do that. But at this point,
25 I'll not admit D-282 then. So the only exhibit for that

1 witness would be 292, which would be the CV, unless I am
2 missing something.

3 MR. WALCZAK: Your Honor, in this case, we
4 actually would like to move in the slides from Professor
5 Padian's demonstrative exhibit.

6 THE COURT: Do you have numbers on them?

7 MR. WALCZAK: We have -- it's going to be
8 Exhibit 720. We have not. We're trying to get a nice
9 color copy.

10 THE COURT: That would encompass all the
11 slides?

12 MR. WALCZAK: I would think it would be
13 easier for the Court to consider all of the slides. And
14 what we have are quotes from either Pandas, quotes from
15 some of the creationist writers. And then the rest of
16 them are either photographs or charts that were prepared
17 by Professor Padian about which he testified here. So
18 certainly on the latter two, there should be no problem.
19 The first two are really, I mean, it's --

20 MR. MUISE: Your Honor, I think the same
21 thing was so done with Dr. Miller. And in terms of, to
22 assist this Court in making its final determination,
23 obviously, there's a lot of testimony that the Court is
24 going to have to review. If they want to provide it to
25 the Court for demonstrative purposes to assist in review

1 of the testimony, we would have no objection to that.

2 We would actually prefer to do the same
3 thing with our expert witnesses, because we're going to
4 have similarly quite a few demonstrative exhibits that I
5 think would facilitate the Court. And as long as it's
6 going to be presented to the Court for that purpose,
7 then we wouldn't object, and we would appreciate the
8 same latitude as well.

9 THE COURT: Well, you're talking about
10 nothing more than a slide that was up during his
11 presentation, is that correct, or some version thereof?

12 MR. WALCZAK: I think there was about a
13 hundred slides. Up to now, we have only introduced
14 those to assist the Court. And I guess they're not
15 properly part of the record. What we're saying with
16 Professor Padian is, at least for the photographs and
17 the charts that he prepared, we would like to move those
18 into evidence.

19 THE COURT: All of which though were viewed
20 or referred to during his testimony, that was my --

21 MR. WALCZAK: Absolutely. Only what's been
22 put up.

23 THE COURT: I think Mr. Muise is correct.
24 There was a similar issue with respect to Professor
25 Miller at the outset of the case, was there not? Didn't

1 you want to do the same?

2 MR. MUISE: I think that Mr. Rothschild --

3 THE COURT: I thought you did, because I
4 think some of the -- I may have the wrong witness. But
5 I think some of the demonstrative slides that were shown
6 were not marked as exhibits, and we did have a
7 discussion, unless my memory fails, and you were going
8 to revisit that and mark those up.

9 So that's fine, but I think what you need to
10 do is, just everybody get on the same page, and I'll
11 take those whenever. I don't need them until the end of
12 the case, obviously. And the same courtesy to
13 Defendants. So if you're going to put the slides up, it
14 will go both ways. But I think it will be helpful for
15 the record.

16 It is certainly helpful for me to revisit
17 those and to put them back in so, however, you want to
18 reproduce them and then enter them. If you want to do
19 it under one exhibit number with bate stamps or one
20 exhibit number with subnumbers, letters, however you do
21 it, it matters not to me.

22 MR. WALCZAK: I'm sorry. I guess I'm not
23 understanding. Mr. Muise is saying that it would be
24 okay to enter the entire demonstrative into evidence?

25 THE COURT: I thought that's what he said,

1 yeah.

2 MR. MUISE: For demonstrative purposes, Your
3 Honor, to assist the Court, not as substantive evidence
4 in addition to the testimony. It's part and parcel to
5 his testimony is the demonstrative exhibits that are
6 going to be provided to assist the Court.

7 MR. WALCZAK: So our position is that, we
8 want to go a step beyond that for the photographs and
9 for the charts.

10 THE COURT: Well, I don't want to waste an
11 excessive amount of time on this, but they were up, and
12 they were up without objection. So I don't know how you
13 separate demonstrative out. I mean, if there's
14 something on the slide -- that's why I said, I think
15 you're going to have to coalesce a little bit on this.

16 If there's something on the slide that's
17 problematic -- here's what I would suggest you do.
18 Let's cut to the chase. Why don't you get a packet of
19 what you want to introduce. From the defense
20 standpoint, you're going to have to do the same. Share
21 it with opposing counsel.

22 I guess there could be statements on an
23 individual slide or presentation that may be at issue.
24 And then let's argue over those, if we have to.
25 Otherwise, they come in for all purposes, as far as I'm

1 concerned. That's what you're saying, I think?

2 MR. WALCZAK: Yes, Your Honor.

3 THE COURT: Demonstrative? What does that
4 mean in the context of this trial? If they're part of
5 record, they're part of the record. I don't think they
6 come in for a limited purpose. If you think that
7 there's something on the slide, and the same for you as
8 far as their slides are concerned, then I think you
9 should argue over that individual.

10 MR. MUISE: That's fine. Again, as long as
11 we have the same latitude with our experts.

12 THE COURT: So I think you have to put a
13 packet together so we see what it is you want to do.

14 MR. WALCZAK: We'll get that packet
15 together. We'll share it with defense counsel. We'll
16 discuss it. And then only if there are some problems --

17 THE COURT: Not only with Professor Padian,
18 but any other witness, because I really suspect there
19 are other ones that you may want to put in. And you
20 may, too, in your case-in-chief. All right. Any other
21 exhibits?

22 MR. WALCZAK: No. Thank you, Your Honor.

23 THE COURT: All right. Thank you. With
24 that, then we will take your witness. And again, to
25 reiterate, we're going to start the defense case,

1 although the Plaintiffs reserve, by the cordial
2 agreement of all counsel, the right and the opportunity
3 to present some witnesses out of turn at a later point
4 in time.

5 MR. MUISE: Your Honor, at this time the
6 Defendants call Dr. Michael Behe.

7 Whereupon,

8 **MICHAEL BEHE**

9 having been duly sworn, testified as follows:

10 COURTROOM DEPUTY: State your name and spell
11 your name for the record.

12 THE WITNESS: My name is Michael Behe.
13 M-i-c-h-a-e-l. The last name is B-e-h-e.

14 **DIRECT EXAMINATION**
15 **ON QUALIFICATIONS**

16 BY MR. MUISE:

17 Q. Good morning. Could you please introduce
18 yourself to the Court?

19 A. Good morning, Your Honor. My name is --

20 THE COURT: I got it.

21 THE WITNESS: Professor Michael Behe.

22 BY MR. MUISE:

23 Q. Dr. Behe, where do you reside?

24 A. I live in Bethlehem, Pennsylvania.

25 Q. Are you married?

1 A. Yes, I am.

2 Q. Do you have children?

3 A. Yes, we do. We have nine children.

4 Q. And you are a Catholic, sir?

5 A. Yes, I am, uh-huh.

6 Q. You share the same religion as Plaintiffs'
7 expert, Dr. Ken Miller, is that correct?

8 A. Yes, we do.

9 MR. MUISE: May I approach the witness, Your
10 Honor?

11 THE COURT: You may.

12 BY MR. MUISE:

13 Q. Dr. Behe, I handed you two binders. One of them
14 has exhibits that are marked that we're going to be
15 working through, through the course of your testimony,
16 so you can refer to those when necessary. Now I'd ask
17 at this time, if you could, just open up that binder and
18 refer to Defendant's Exhibit 249, which should be your
19 curriculum vitae under tab 1; is that correct?

20 A. That's correct, yes.

21 Q. Is that a fair and accurate copy of your CV?

22 A. Yes, it seems to be.

23 Q. Again, I want you to refer to it as we go through
24 some of your background and qualifications to offer your
25 expert opinions in this case. Sir, what is your

1 profession?

2 A. I am a professor in the department of biological
3 sciences at Lehigh University in Bethlehem,
4 Pennsylvania.

5 Q. And you're a biochemist?

6 A. That's correct, yes.

7 Q. How long have you taught at the college level?

8 A. For 23 years.

9 Q. Now you say you presently teach at Lehigh
10 University, is that correct?

11 A. That's right.

12 Q. Have you taught in other colleges?

13 A. Yes, I taught at Queens College of the City
14 University of New York for three years.

15 Q. So how long have you taught at the college level?

16 A. A total of 23 years.

17 Q. Has that been in chemistry and biochemistry?

18 A. Yes, both chemistry and biology departments. I'm
19 a biochemist. It fits into both.

20 Q. So you're a tenured professor at Lehigh
21 University?

22 A. Yes.

23 Q. And what subjects have you taught at the college
24 level?

25 A. A number of subjects. I've taught biochemistry

1 at the undergraduate level. I've taught courses on
2 protein structure and (inaudible) --

3 COURT REPORTER: Would you repeat that?
4 What did you say after protein structure?

5 THE WITNESS: Nucleic acid structure.

6 BY MR. MUISE:

7 Q. We're obviously going to be talking about some
8 difficult things throughout this morning, some technical
9 terms. We need to make sure we go slow and articulate
10 those to help out our court reporter here.

11 A. Sure.

12 Q. Okay. Could you continue, please?

13 A. I also taught organic chemistry, general
14 chemistry on occasion. I have taught a, what's called
15 a, college seminar course, a writing course for biology
16 majors, and others as well.

17 Q. And what are the subjects that you presently
18 teach at Lehigh University?

19 A. Well, this term, I'm teaching the general
20 biochemistry course.

21 Q. Have you taught any courses about evolution?

22 A. Yes, I teach one. It's that college seminar
23 course that I mentioned. It's titled Popular Arguments
24 on Evolution.

25 Q. And is that a course that's for all majors, is

1 that correct?

2 A. Yes, it's for incoming freshmen with any
3 background or any intended major.

4 Q. And during that course, you discuss Darwin's
5 theory of evolution?

6 A. Yes, it's a discussion course where we read
7 popular arguments on the topic of evolution. We discuss
8 Darwin's theory. We discuss alternative ideas as well.

9 Q. How long have you been teaching this seminar?

10 A. Oh, about 12 years now.

11 Q. So in total, you have 23 years of teaching
12 science at the college and graduate level, is that
13 correct?

14 A. Yes, that's right.

15 Q. Now you said you were a biochemist, and we heard
16 testimony from Dr. Miller that he was a cell biologist.
17 What's the difference between a biochemist and a cell
18 biologist?

19 A. Well, a biochemist studies the molecular bases of
20 life, and sometimes these things blur together, but a
21 biochemist generally studies molecules that are too
22 small to see with a microscope. Cell biology, on the
23 other hand, as its name implies, studies cells, things
24 that can be seen with light microscopes, electron
25 microscopes, and which generally consist of large

1 aggregates of molecules rather than individual ones.

2 Q. Now we're going to hear some testimony later in
3 this trial from a microbiologist. How does a
4 microbiologist differ from a biochemist?

5 A. Well, classically microbiology is concerned with
6 single celled organisms, bacteria, viruses, single
7 celled eukaryotic cells as well, and sometimes focuses
8 on the sorts of diseases that those things cause.

9 Q. Now, sir, do you conduct experiments in your
10 work?

11 A. Well, at this point, for the past couple years,
12 I've been more interested in theoretical issues rather
13 than experimental ones.

14 Q. Have you though conducted experimental work in
15 your past?

16 A. Yes, quite a bit.

17 Q. Was there a particular focus of your experimental
18 work?

19 A. Yes, I focused on nucleic acid structure.

20 Q. Is that the focus of your current research?

21 A. No, it isn't.

22 Q. What is the focus of your current research?

23 A. Currently, I'm interested in the issue of
24 intelligent design in biochemistry and aspects of that.

25 Q. And how long have you been doing that?

1 A. Oh, I guess, perhaps the past seven, eight years.

2 Q. Sir, what degrees do you hold?

3 A. I have a bachelor of science degree in chemistry
4 from Drexel University and a Ph.D. in biochemistry from
5 the University of Pennsylvania.

6 Q. And when did you receive your Ph.D. in
7 biochemistry from the University of Pennsylvania?

8 A. In 1978.

9 Q. I take it, you wrote a dissertation to get your
10 Ph.D.?

11 A. Yes, I sure did.

12 Q. What was that dissertation?

13 A. It was entitled Biophysical Aspects of Sickle
14 Hemoglobin Gelation. It dealt with the behavior of
15 something called sickle cell hemoglobin, which underlies
16 sickle cell disease, which many people have heard of.

17 Q. Do you belong to any professional memberships?

18 A. Yes, I do. I am a member of the American Society
19 for Biochemistry and Molecular Biology. I'm also a
20 member of something called the Protein Society.

21 Q. Now, sir, have you published articles in peer
22 reviewed science journals?

23 A. Yes, I have.

24 Q. Do you have an approximation of how many peer
25 reviewed articles you published?

1 A. I think at about 38 or 39.

2 Q. And what are some of the scientific journals that
3 you published in?

4 A. Well, I have published in Nature, Proceedings in
5 the National Academy of Sciences, Journal of Molecular
6 Biology, the Journal of Biological Chemistry,
7 Biochemistry, Nucleic Acids Research, and some others as
8 well.

9 Q. Doctor, you're a fellow with the Discovery
10 Institute?

11 A. Yes, I am.

12 Q. What does that mean?

13 A. Well, pretty much it means that, my name gets put
14 on the letterhead, and every now and again, we get
15 together and talk. And it's pretty much a means of
16 communicating with other people who are interested in
17 issues that I am.

18 Q. Does the Discovery Institute maintain any control
19 over the work that you do?

20 A. No.

21 Q. Are you considered an employee of the Discovery
22 Institute?

23 A. No.

24 Q. Do they direct you in the work that you do?

25 A. No.

1 Q. Now, sir, you're the author of a book called
2 Darwin's Black Box, correct?

3 A. Yes, that's right.

4 Q. And that's a book about intelligent design, is
5 that accurate?

6 A. Yes, that's right.

7 Q. How many copies has that book sold?

8 A. Somewhere over 200,000 at this point.

9 Q. Has it been translated into other languages?

10 A. Yes, it's been translated, I think, into 10, a
11 little more than 10 languages; Portuguese, Spanish,
12 Hungarian, Dutch, Korean, Japanese, Chinese, and some
13 other ones, too, I think.

14 Q. Now you also contribute to the 1993 version of
15 the Pandalas book, is that correct?

16 A. Yes, I did.

17 Q. What was your contribution?

18 A. I wrote a portion that dealt with the blood
19 clotting cascade.

20 Q. We've heard testimony about some prior versions
21 of Pandalas. Did you make any contributions to any prior
22 versions of the Pandalas other than that 1993 version?

23 A. No, just that second edition.

24 Q. Now, sir, you've been described as an advocate
25 for intelligent design, is that accurate?

1 A. Yes, uh-huh.

2 Q. And you stated that you are a Catholic, correct?

3 A. Yes.

4 Q. Is Darwin's theory of evolution inconsistent with
5 your private religious beliefs?

6 A. No, not at all.

7 Q. Do you have any religious commitment to
8 intelligent design?

9 A. No, I don't.

10 Q. Do you have any private religious convictions
11 that require you to advocate in favor of intelligent
12 design?

13 A. No, I do not.

14 Q. Sir, why did you get involved with intelligent
15 design?

16 A. Well, I used to think that Darwinian theory was a
17 complete and good explanation for life, but in the late
18 1980's, I read a book by a scientist by the name of
19 Michael Denton. The book was called Evolution: A Theory
20 in Crisis, which raised questions about Darwinian theory
21 that I had never thought about before. At that point, I
22 began to think that it might not be an adequate
23 scientific explanation as much as it was claimed; and at
24 that point, I began to think more about these topics and
25 think about the topic of intelligent design as well.

1 Q. Is your interest in intelligent design based on
2 what the scientific evidence shows?

3 A. Yes.

4 Q. Sir, are you familiar with a term called
5 young-earth creationist?

6 A. Yes, I've heard.

7 Q. Do you consider yourself to be a young-earth
8 creationist?

9 A. No, I'm not.

10 Q. Are you familiar with the term old-earth
11 creationist?

12 A. I've heard that one, too.

13 Q. Do you consider yourself to be an old-earth
14 creationist?

15 A. No, I do not.

16 Q. Are you familiar with the term special creation?

17 A. Yes, I've heard it.

18 Q. Do you consider yourself to be a -- I'm not sure
19 if the term is a special creationist or a creationist in
20 terms of special creation. Either way, do you consider
21 yourself that?

22 A. Neither one, no.

23 Q. As you testified to, you authored Darwin's Black
24 Box, which is a book about intelligent design. And we
25 have up on the screen. Is that what's shown up on the

1 screen, is that exhibit, is that demonstrative, is that
2 a picture of the cover of your book?

3 A. Yes, that's a picture of the hard cover edition
4 of the book.

5 Q. What is the subtitle?

6 A. It's called The Biochemical Challenge to
7 Evolution.

8 Q. Now you use the term black box in this book.
9 Does that have a particular meaning in science?

10 A. Yes. In science, it's used sometimes to indicate
11 some system or some structure or some machine that does
12 something interesting, but you don't know how it works.
13 You don't know how it works because you can't see inside
14 the black box and, therefore, can't figure it out.

15 Q. So what's the connection then with Darwin's Black
16 Box?

17 A. It turns out that in Darwin's day, the contents
18 of the cell were unknown. People could see it do
19 interesting things. It could move. It could reproduce
20 and so on. But how it could do that was utterly
21 unknown. And many people at the time, many scientists
22 at this time such as Ernst Haeckel and others, Thomas
23 Huxley thought that, in fact, the basis of life, the
24 cell, would be very simple, that it would turn out to
25 just be a glob of protoplasts, something akin to a

1 microscopic piece of Jell-O.

2 But in the meantime, in the past 150 some odd
3 years, science has advanced considerably and has
4 determined that the cell is, in fact, full of very, very
5 complex machinery. And so the Black Box of the title is
6 the cell. To Darwin and scientists of his time, the
7 cell was a black box.

8 Q. Now when was this book published?

9 A. It was published in 1996.

10 Q. And if you could, give us sort of the Reader's
11 Digest summary of what's in this book?

12 A. Well, in brief, in Darwin's day, the cell was a
13 -- an obscure entity, and people thought it was simple,
14 but the progress of science has shown that it's
15 completely different from those initial expectations,
16 and that, in fact, the cell is chock full of complex
17 molecular machinery, and that aspects of this machinery
18 look to be what we see when we perceive design.

19 They look like they are poorly explained by
20 Darwin's theory. And so I proposed that a better
21 explanation for these aspects of life is, in fact,
22 intelligent design.

23 Q. So again, this is a book about intelligent
24 design?

25 A. Yes.

1 Q. Did you write this book to make a theological or
2 philosophical argument?

3 A. No.

4 Q. What was the purpose of writing the book?

5 A. The purpose of the book was to say that the
6 physical empirical evidence, the scientific evidence
7 points to a conclusion of intelligent design.

8 Q. I take it that, this book does address Darwin's
9 theory of evolution?

10 A. Yes, it does.

11 Q. Does it do so by relying on scientific data and
12 research?

13 A. Yes, it does.

14 Q. Sir, is it accurate to say that, in this book,
15 you coined the term irreducible complexity?

16 A. Yes.

17 Q. Had you used that term previous to the
18 publication of this book?

19 A. Not in any publication that I can remember.

20 Q. Through the writing of this book, did you become
21 familiar with the scientific evidence as it relates to
22 the Darwin's theory of evolution?

23 A. Yes, I did.

24 Q. Sir, was this book peer reviewed before it was
25 published?

1 A. Yes, it was.

2 Q. By whom?

3 A. Well, the publisher of the book, Free Press, sent
4 it out to be -- sent the manuscript out to be read prior
5 to publication by five scientists.

6 Q. What were the backgrounds of some of these
7 scientists?

8 A. One is a man named Robert Shapiro, who is a
9 professor in the chemistry department at New York
10 University and an expert in origin of life studies.
11 Another man was named Michael Atchinson, I believe, and
12 he's a biochemistry professor, I think, in the vet
13 school at the University of Pennsylvania.

14 Another man, whose name escapes me, I think it's
15 Morrow, who was a biochemistry professor at Texas Tech
16 University. Another biochemist, I think, at Washington
17 University, but his name still escapes me. And I have
18 forgotten the fifth person.

19 Q. Now did you suggest any names of reviewers for
20 the publisher?

21 A. Yes, I suggested names, uh-huh.

22 Q. From your years as a scientist, is that a
23 standing practice?

24 A. It's pretty common, yes. A number of journals, a
25 number of science journals require an author, when

1 submitting a manuscript, to submit names of potential
2 reviewers simply to help the editors select reviewers.
3 Oftentimes, the editor is not really up-to-date with
4 who's working in which field.

5 Q. Dr. Padian, if my recollection is correct,
6 testified on Friday that it wasn't a standard practice
7 to identify potential reviewers for your work. How do
8 you respond to that?

9 A. Well, Professor Padian is a paleontologist.
10 Maybe I'm not familiar with paleontology journals.
11 Perhaps in those, it's not common. But it certainly is
12 common in biochemistry and molecular biology journals.

13 Q. Now after this book was published, was it
14 reviewed by scientists?

15 A. Yes, it was reviewed pretty widely.

16 Q. And some criticisms were offered, is that
17 correct?

18 A. Yes, that's fair to say.

19 Q. Did you respond to these criticisms?

20 A. Yes, in a number of different places.

21 Q. Did you respond to them at all in any articles
22 that you published?

23 A. Yes, I've published several articles. One, I
24 published, which is perhaps the most extensive, is
25 called a Reply to My Critics in Response to Reviews of

1 Darwin's Black Box.

2 Q. Sir, if you could look in that binder that I gave
3 you at Defendant's Exhibit 203-H. And I believe it
4 should be under tab 2 in front of you.

5 A. Yes, thank you.

6 Q. Is that the article you are referring to?

7 A. Yes, this is it.

8 Q. And when was this article published?

9 A. That was published in the year 2001.

10 Q. And where was it published?

11 A. In a journal called Biology and Philosophy.

12 Q. Is that a peer reviewed journal?

13 A. Yes, it is.

14 Q. What kind of journal is it?

15 A. It's a philosophy of science journal.

16 Q. Now we have heard testimony in this case about
17 peer reviewed science journals. Are science journals
18 the only medium by which scientists publish their
19 scientific ideas and arguments?

20 A. No, scientists publish other ways as well.

21 Q. Do they publish their ideas and arguments in
22 books, for example?

23 A. Yes, that's certainly a prominent medium by which
24 to publish scientific arguments.

25 Q. Does the scientific community take science books

1 seriously?

2 A. They certainly do.

3 Q. Have you prepared some exhibits to demonstrate
4 this point?

5 A. Yes, I do. If you can show the next slide,
6 please. This is a -- the table of contents from an
7 issue of Nature from May of this year. And if you could
8 advance to the next slide, this is a blow-up of a part
9 of the portion. You can see that this is the spring
10 books issue. In every issue of Nature, they review at
11 least one or two different books on scientific topics.

12 Once or twice a year, they have a special issue
13 in which they concentrate on books. Altogether, Nature
14 reviews perhaps 100 to 200 science books per year.

15 Q. This is the prominent Nature magazine that we've
16 heard some testimony about here in court?

17 A. Yes, Nature is the most prominent science journal
18 in the world.

19 Q. Have you provided some examples of some books
20 where scientists are making scientific arguments?

21 A. Yes, to help see what's -- what is done here, if
22 you could go to the next slide. These are some
23 relatively recent books by scientists making scientific
24 arguments. For example, up on the upper left-hand
25 corner is a relatively new book called Rare Earth by a

1 couple of scientists at the University of Washington
2 named Peter Ward and Donald Brownlee.

3 In this book, they argue that the position of the
4 Earth in the universe is so rare, so special, because of
5 factors such as its existing in a portion of the galaxy
6 where heavy metals are relatively common, where super
7 novas are not so common, that it may be one of the few
8 places, perhaps the only place in the universe where
9 intelligent life could exist.

10 Up on the upper right-hand portion of the slide
11 is a book entitled The Fifth Miracle by a physicist by
12 the name of Paul Davies who writes about -- often writes
13 about physical topics such as The Big Bang and the laws
14 of nature and so on. In this, he reviewed the
15 literature on the origin of life, and concluded that,
16 currently, we have no understanding of how life could
17 have originated on the earth. And he says that a
18 completely new understanding or completely new ideas on
19 that topic are required.

20 On the bottom left-hand corner of the slide is a
21 picture of the cover of a book called At Home in the
22 Universe by a man named Stuart Kauffman, who is a
23 professor of biology at the University of Toronto
24 currently. And in this, he explains his ideas about
25 something called self-organization and complexity

1 theory. And he writes why he thinks Darwinian
2 mechanisms are insufficient to explain what we know
3 about biology.

4 On the lower right-hand corner of the slide is a
5 relatively new book called Endless Forms Most Beautiful,
6 subtitled The New Science of Evo Devo, which stands for
7 evolutionary developmental biology.

8 Q. Now my understanding from the testimony from Dr.
9 Padian on Friday, that's a fairly up and coming area in
10 scientific research?

11 A. Yes, that's right. It's generated some
12 excitement, uh-huh. And this is written by a man named
13 Sean Carroll, who's a professor of biology at the
14 University of Wisconsin. And in this book, he gathers a
15 lot of data and cites a lot of papers to argue the case
16 that, in fact, much of evolution is not due to changes
17 in protein structure as had once been thought, but
18 perhaps is due to changes in regulatory regions that
19 tell the cell how much of a particular protein to make.

20 If we could go to the next slide then. Here are
21 four more books of scientists making scientific
22 arguments. The top two are by the same author. The
23 first one might be difficult to read. It's Richard
24 Dawkins on the top left and the top right. His book
25 here is entitled The Selfish Gene. And in this book, he

1 argues that evolution is best understood not at the
2 organismal level, but rather at the level of the gene, a
3 fragment of DNA which can be replicated.

4 On the upper right is another book by Dawkins
5 entitled *The Extended Phenotype* in which he argues that
6 genes cannot only affect the body of the organism in
7 which they reside, but can affect the larger environment
8 as well.

9 And I think a good example he uses is that of a
10 beaver in which, presumably, genes in the beaver's body
11 push it to cut down trees and build dams thereby
12 affecting the environment. I'm not sure if I mention,
13 but Richard Dawkins is a professor of biology at Oxford
14 University in England.

15 I have a copy of the cover of my book there in
16 the lower left, which I include in this category. On
17 the lower right-hand side is a book called *The*
18 *Astonishing Hypothesis, The Scientific Search for the*
19 *Soul*, which is written by a man named Francis Crick,
20 who is a Nobel laureate, Nobel Prize winner who, along
21 with James Watson, first deduced the double helical
22 structure of DNA.

23 And in this book, he argues that, in fact, what
24 we call the mind, or what some people think of it as the
25 soul, is, in fact, in actuality the effects the chemical

1 and neurological processes in the brain.

2 Q. Do you have several more slides?

3 A. Yes, I do. Actually, the next slide here, I
4 wanted to concentrate a little bit on this book, which
5 is a brand new book published about a month or two ago,
6 and it's entitled The Plausibility of Life, and it's
7 subtitled Resolving Darwin's Dilemma. It's written by
8 two authors, a man named Mark Kirschner, who is a
9 chairman of the department of systems biology at Harvard
10 University Medical School, and a man named John Gerhart,
11 who is a biology professor at the University of
12 California at Berkeley.

13 And Darwin's dilemma that they proposed to
14 resolve in this book is that, in Darwinian theory,
15 natural selection needs a source of variation to select
16 among. And they argue that random variation is
17 insufficient to supply that. And instead, they offer
18 arguments for, what they call, a form of essentially
19 directed variation.

20 But what I want to concentrate is on some text
21 that they have in the beginning of the book. Let me
22 just read this. They write, quote, This book is about
23 the origins of novelty in evolution. The brain, the
24 eye, and the hand are all anatomical forms that
25 exquisitely serve function. They seem to reveal design.

1 How could they have arisen?

2 Let me make a couple points about this. First of
3 all, they treat the origins of novelty as a live
4 question. This is something that is currently
5 unresolved. And the further point is that, they think
6 that the physical structures of these forms seem to, in
7 their words, reveal design.

8 Q. Now this book was published by Yale University
9 Press, is that correct?

10 A. Yes, that's right.

11 Q. That's an academic press?

12 A. Yes, it is, a very prestigious one. If we could
13 look at the next slide. They go on further in their
14 introduction to make some points that I thought would be
15 useful to make here. In this, they say, In this book,
16 we propose a major new scientific theory, which they
17 call facilitated variation. Let me just emphasize that
18 the point that, in fact, these eminent biologists are
19 saying that they are proposing a new theory, and the
20 means by which they are proposing that new theory is to
21 write about it in this book.

22 And if you look further along on this slide, they
23 write, quote, We present facilitated variation not only
24 for the scientist, but also for the interested
25 nonscientist.

1 So the point is that, scientific books can
2 propose new scientific theories, and they can be
3 addressed to a broad audience, not only to scientists,
4 not only to specialist groups, but also to the wider
5 public as well.

6 And if we can go to the next slide. They explain
7 in this slide why, in fact, they use the language that
8 -- kind of language that they use in their book.

9 They write, quote, Even if we had tried to
10 confine the message to professional biologists, we would
11 have had problems. In which subfield would this book be
12 understood? We decided that a common, straightforward
13 vocabulary was essential just to reach scientists as a
14 group. To move beyond scientists to the lay public
15 required further adjustments, but fewer than one might
16 expect.

17 So the point here is that, if you are addressing
18 a scientific topic which cuts across subdisciplines, the
19 subdisciplines, which might have their own specialized
20 vocabulary, the best way to do it might be to write the
21 book in plain English or as in plain English as is
22 possible. That's what Kirschner and Gerhard tried to
23 do.

24 Q. Is that what you, in fact, tried to Darwin's
25 Black Box?

1 A. That's exactly what I tried to do.

2 Q. You authored numerous peer reviewed articles,
3 many in scientific journals, which you eluded to
4 previously. Is there one area in which you have
5 published the most in these science journals?

6 A. Yes, nucleic acid structure.

7 Q. Have you authored any articles appearing in peer
8 reviewed science journals that make intelligent design
9 arguments?

10 A. Yes, I did, one.

11 Q. What article is that?

12 A. It was an article that I published with a man
13 named David Snoke, who's in the physics department at
14 the University of Pittsburgh, and was published in a
15 journal called Protein Science.

16 Q. Sir, again, I would direct your attention to the
17 exhibit book that was provided. And if you look under
18 tab 3, there should be an exhibit marked Defendant's
19 Exhibit 203-J. Do you see that, sir?

20 A. Yes.

21 Q. Is that the article you're referring to?

22 A. Yes, that's right. It's entitled Simulating
23 Evolution by Gene Duplication of Protein Features That
24 Require Multiple Amino Acid Residues.

25 Q. Again, you said that was published in Protein

1 Science?

2 A. Yes.

3 Q. A peer reviewed science journals?

4 A. Yes, that's correct.

5 Q. And published in 2004?

6 A. That's right, last year.

7 Q. Could you give us a thumbnail sketch of what that
8 article is about?

9 A. Yes. It's a theoretical study that uses models
10 to describe the process of protein evolution of new
11 features, and we say that it seems to present, focus on
12 problems for Darwinian evolution.

13 Q. Now you stated that you consider this to be an
14 intelligent design article, is that correct?

15 A. Yes, I do.

16 Q. And why is that?

17 A. Because it asks questions about how much
18 unintelligent processes can explain in life and,
19 therefore, points our attention to what intelligence is
20 required to explain as well.

21 Q. Now we eluded to a concept of irreducible
22 complexity, a concept that you introduced in your book,
23 Darwin's Black Box. Did you use the term irreducible
24 complexity -- let me back up. Did you use the concept
25 of irreducible complexity in this particular paper?

1 manuscript, that could be a problem.

2 MR. MUISE: Well, Your Honor, he's only
3 eluded to that he made changes on this particular
4 article based on recommendations from the editorial
5 board. And I asked him why they asked him to make those
6 changes on it. He was asked these same questions during
7 his deposition, Your Honor. It's kind of surprising
8 they're objecting to this.

9 MR. ROTHSCHILD: This did come up in the
10 deposition. But if they're going to rely on this as
11 evidence, as this being actually an article about
12 irreducible complexity, and this is the evidence they're
13 going to rely upon, then they got to produce the
14 evidence. Otherwise, it's hearsay.

15 THE COURT: What are you asking they
16 produce?

17 MR. ROTHSCHILD: The manuscript that Dr.
18 Behe sent which used the term irreducible complexity and
19 any written responses that they received.

20 THE COURT: Are you saying that there is a
21 discovery request that could arguably have been intended
22 to cover production of that manuscript and you didn't
23 get it or -- I guess Mr. Muise's point is, you didn't
24 ask for it.

25 MR. ROTHSCHILD: Well, I mean, there's no

1 discovery request that specific. Though we're entitled
2 to the materials that the expert relies upon as the
3 basis for his opinion, which, as a general matter, has
4 certainly been exchanged by both sides and were cited in
5 reports and exchanged.

6 And this is an instance where I don't -- I
7 don't believe the burden is on the Plaintiffs to request
8 documents because the issue is, if you're going to bring
9 hearsay into this case, which is what Dr. Behe is doing,
10 or counsel is doing for a very substantive point, then I
11 object that it's hearsay and --

12 THE COURT: That is the change to the
13 manuscript?

14 MR. ROTHSCHILD: The change to the
15 manuscript and any response which, I think, Professor
16 Behe is portraying as the reason why an article about
17 irreducible complexity suddenly became an article not
18 about irreducible complexity.

19 MR. MUISE: I don't believe that's what he
20 received to. He said he discussed the concept of it.
21 He was told to take the word out in one of the drafts,
22 and so he did. And the article that they have a copy of
23 is the one that the article came out. They were asked,
24 they asked him those same questions. He said the same
25 thing. The the editor told me to take the word out.

1 THE COURT: Do you have the manuscript?

2 MR. MUISE: I don't have it here with me,
3 Your Honor. I'm not sure if that manuscript is still
4 here. Again, the point is, it's the editorial, the
5 editor told him that, and that's all he's testified to.

6 MR. ROTHSCHILD: It's hearsay.

7 THE COURT: Isn't that hearsay?

8 MR. MUISE: Well, Your Honor, as we've gone
9 through time and time again, the experts can rely on
10 hearsay when they're formulating opinions. And it's an
11 explanation of why this concept is not going to be in
12 there.

13 And I'm certain that Mr. Rothschild is going
14 to cross-examine him as to why that concept is not in
15 here, and it's just making it plain. The editor told
16 him to take the term out, argue the concept, but take
17 the term out.

18 MR. ROTHSCHILD: This is exactly the point,
19 Your Honor. I mean, this is not the kind of hearsay
20 that an expert in biochemistry or intelligent design
21 would rely upon, which is presumably other scientific
22 materials. This is a personal exchange about what
23 happened with this article. And I would like to
24 cross-examine him about it. But this is hearsay, and I
25 don't have the evidence.

1 THE COURT: Well, I do think the quality --
2 I think you attempt to equate this hearsay with the
3 hearsay that might otherwise be allowed with an expert.
4 I think there is a distinction here. And I think this
5 is hearsay arguably that's of a quality that ought not
6 be admitted.

7 MR. MUISE: Your Honor, it's also -- it's
8 offered to demonstrate what it is, why he took that term
9 out. I mean, you don't have to even rely --

10 THE COURT: Isn't that a highly material
11 point?

12 MR. MUISE: It certainly explains his
13 actions why he did that.

14 THE COURT: Sure. But I think that the
15 hearsay that we're talking about is a different type of
16 hearsay than the hearsay that might customarily be that
17 an expert's report might customarily be predicated on.
18 I see a distinction. I understand Mr. Rothschild's
19 point.

20 Well, let me ask you this. If Mr. Muise
21 produces the manuscript for the purpose of -- is it in
22 the building, the manuscript? Does it exist here?

23 MR. MUISE: Your Honor, I'd have to consult
24 with Dr. Behe about whatever the letter exchanged, if
25 there's anything available.

1 THE COURT: If you can't produce a
2 manuscript for the purpose of cross examination, then
3 I'll sustain the objection at this point, and you can
4 move on.

5 BY MR. MUISE:

6 Q. Dr. Behe, with the article that was actually
7 published, did you discuss the concept of irreducible
8 complexity?

9 A. Yes.

10 Q. But the term itself was not included in there,
11 correct?

12 A. That's correct.

13 Q. Have you submitted any other articles on
14 intelligent design to peer reviewed science journals?

15 A. Yes, I did. One article I submitted to a journal
16 called the Journal of Molecular Evolution. And it
17 actually contained a subset of the material that was
18 eventually published in the article or Reply to my
19 Critics in the journal of Biology and Philosophy.

20 Q. Did they publish that article in that journal?

21 A. No, they didn't.

22 Q. Did the publisher give you a reason for not doing
23 so?

24 A. Yes, he did.

25 MR. ROTHSCHILD: Objection, Your Honor. The

1 same hearsay.

2 MR. MUISE: Your Honor, it kind of
3 remarkable to me. He's -- you've heard throughout this
4 trial that, you know, they are not submitting their
5 articles for peer review. Here, he's attempting to do
6 that, and he's got publishers that are telling him that
7 they're not going to publish them.

8 And I'm enlisting from him what it is the
9 publishers are telling him why these things aren't being
10 published. That's entirely relevant to this -- to these
11 proceedings.

12 THE COURT: But it's hearsay.

13 MR. MUISE: He can certainly testify to that
14 because that demonstrates what he -- what he was told,
15 and what the effect of that is, is relevant. It doesn't
16 necessarily even have to go to the substance of the
17 conversation. It goes to what is being told as to why
18 these peer reviewed journals are not being published.

19 MR. ROTHSCHILD: I think the fact that they
20 are being rejected by peer review publications are
21 certainly relevant, and he can testify about that,
22 because that's what happened to him. But the reasons
23 are being introduced for the truth. This is why we are
24 rejecting it.

25 THE COURT: I agree with that. The

1 objection is sustained.

2 BY MR. MUISE:

3 Q. Sir, do you perceive a bias against publishing
4 intelligent design articles in science journals?

5 A. Yes, I do.

6 Q. Could you explain?

7 A. It's based on my personal experiences trying to
8 publish such material. It's based on conversations with
9 other people. It's based on news stories about persons
10 who did, in fact, publish an article mentioning
11 intelligent design. So, yes, I do.

12 Q. Now, sir, you had a part in drafting a section
13 contained in the 1993 version of Pandas, correct?

14 A. Yes.

15 Q. I believe you testified it was the blood clotting
16 section?

17 A. Yes, that's correct.

18 Q. Is that section still valid based on current
19 scientific evidence?

20 A. Yes, it is.

21 Q. Did you write about the blood clotting cascade in
22 Darwin's Black Box?

23 A. Yes, I did.

24 Q. Is that section similar to the blood clotting
25 cascade section you wrote in Pandas?

1 A. Yes, it's similar. It's lengthier, but it's
2 similar. Yes.

3 Q. I believe you testified you didn't contribute to
4 any parts of the prior drafts of Pandas, is that
5 correct?

6 A. That's correct, just to this one.

7 Q. In the blood clotting cascade section of Pandas,
8 were you advancing any religious or philosophical
9 arguments?

10 A. No, I was not.

11 Q. What were you doing in that section?

12 A. I was making a scientific argument that the blood
13 clotting cascade is poorly explained by Darwinian
14 processes but is well explained by design.

15 Q. Now is it your understanding that this book
16 Pandas is part of the controversy in this lawsuit?

17 A. Yes, I understand that.

18 Q. What is your understanding of how this book will
19 be used at Dover High School?

20 A. I understand that there is a short statement that
21 is read to students that says that the book Of Pandas
22 and People is available in the school library for
23 students to access.

24 Q. Do you see that as a good thing?

25 A. Yes, I do.

1 Q. Why?

2 A. Because the book *Of Pandas and People* brings a
3 different viewpoint, a different perspective to the same
4 data that is viewed oftentimes through a Darwinian
5 perspective, and it can show students that viewing data
6 from different directions oftentimes can affect how we
7 judge the strength of data, how we judge the problems
8 associated with a particular viewpoint and so on.

9 Q. Now this book was published in 1993, correct?

10 A. Yes.

11 Q. And you're aware that Dr. Miller has criticized
12 several sections in this book?

13 A. Yes, I heard him.

14 Q. Do you intend to address his claims in your
15 testimony today?

16 A. Yes, I intend to, yes.

17 Q. Of the sections that he addressed, are they still
18 scientifically valid?

19 A. Yes, they are.

20 Q. Now would you recommend this book as a primary
21 text for biology class?

22 A. No, I wouldn't recommend it as a primary text.
23 It's not intended as a primary text.

24 Q. Any other reasons?

25 A. Well, yes. It was written in 1993. And so

1 science advances pretty quickly, and so it's not
2 appropriate for use as a primary text because of that.

3 Q. Has intelligent design advanced since 1993?

4 A. Yes, it certainly has.

5 Q. Would you recommend that it be used in the manner
6 that Dover High School is using it?

7 A. Yes, I think that's a fine way to use it.

8 Q. And I believe for the reasons you stated
9 previously in your testimony?

10 A. Yes, that's right, because it gives students a
11 different perspective on data, allows them to separate
12 data from theory, allows them to view problems from
13 different perspectives, and some people who think one
14 theory is correct will oftentimes view problems as less
15 severe than people who view the data from a different
16 perspective.

17 Q. Do you think that schools should teach the theory
18 of evolution?

19 A. Yes, I certainly do.

20 Q. And why is that?

21 A. Well, the theory of evolution is widely used in
22 science. It is, in many aspects, well substantiated.
23 It's used by working scientists and any well-educated
24 student should understand it.

25 Q. By advocating intelligent design, is it your goal

1 to not have the theory of evolution taught in the
2 biology class?

3 A. No, certainly not.

4 Q. Has that ever been your goal?

5 A. Never, no.

6 Q. Now Dr. Miller testified on direct as follows:
7 Quote, It's important to appreciate as well what peer
8 review actually means. And what it means is subjecting
9 your scientific ideas to the open scrutiny and criticism
10 of your colleagues and competitors in the field, end
11 quote. Do you agree with that?

12 A. Yes, wholeheartedly.

13 Q. Have you subjected your scientific ideas on
14 intelligent design to open scrutiny and criticism of
15 your colleagues and competitors in the field?

16 A. Yes. I have to say that my ideas on intelligent
17 design have been subjected to about a thousand times
18 more scrutiny than anything I've ever written before.

19 Q. And how have you subjected your ideas to such
20 scrutiny?

21 A. Well, in a number of ways. I've written those
22 papers that were described earlier here. I wrote the
23 book itself. The book has been reviewed. It was sent
24 out earlier to be reviewed. And also, I've been, since
25 the book was published, giving seminars, engaging in

1 discussions and so on before academic groups.

2 Q. And have you had -- have you prepared some slides
3 to demonstrate this point?

4 A. Yes, I have. Here is a selection of a number of
5 seminars and discussions that I've had specifically with
6 academic groups on my ideas about intelligent design
7 since the book was published. Soon after the book came
8 out in the summer of 1996, I spoke with the department
9 of biology at a place called King's College, which is
10 near Lehigh in Wilkes-Barre.

11 Q. Again, these are with academic or science groups,
12 is that correct?

13 A. Yes, these are exclusively academic groups.

14 Q. Included in these seminars are other scientists?

15 A. Yes. A seminar in a department like this
16 normally involves much of the faculty of the department,
17 graduate students, undergraduates, and so on. Sometimes
18 faculty from other departments as well.

19 Q. Could you continue, please?

20 A. Yes, the text in bold are seminars and talks to
21 science departments. So the department of biology at
22 the University of South Florida, I gave a talk in 1996;
23 at the department of chemistry at Villanova University;
24 the department of philosophy, there was a symposium with
25 a man named Daniel Dennett and a man named David Haig

1 held at the University of Notre Dame.

2 Now that's underlined. I underlined talks in
3 which opposing speakers were there presenting
4 alternative points of view. And David Haig is a
5 professor of evolutionary biology at Harvard University.
6 Daniel Dennett is a philosophy professor at Tufts
7 University, and has published several books on Darwinian
8 thought and its philosophical ramifications.

9 Q. Now that was in the department of philosophy.
10 But did you also -- did you argue the scientific
11 arguments?

12 A. Yes. Myself and David Haig made scientific
13 arguments, and Daniel Dennett made both scientific and
14 philosophical arguments. I should add that a number of
15 philosophers are oftentimes interested in scientific
16 ideas and seek philosophical implications for them. So
17 I do get invitations from philosophy departments as
18 well.

19 Q. Continue, please.

20 A. There was a symposium held at a school called
21 Wheaton College, and participants in that symposium
22 included a man named James Shapiro and David Hull.
23 James Shapiro is a professor of microbiology at the
24 University of Chicago. And while he's skeptical of
25 Darwinian theory, he is not a proponent of intelligent

1 design. So he presented an alternative point of view.
2 David Hull is a philosopher of biology at Northwestern
3 University and a firm believer in Darwinian theory.

4 Also, I gave a presentation to the department of
5 mathematics at the University of Texas, El Paso, in
6 1997.

7 Q. Is there -- I mean, is there a relationship
8 between science and mathematics?

9 A. Yes. Yes, there certainly is. Mathematics is
10 called the language of science. Practically all
11 scientists rely on mathematics for their work and it --
12 mathematics is used to reach conclusions and to view
13 evidence and to marshal arguments.

14 Next slide, please. A couple more. The
15 department of chemistry at Colgate University in 1997;
16 the department of philosophy, they have a place called
17 Saint Norbert College in Wisconsin. They have a lecture
18 series called the Killeen Chair Lecture. They invited
19 me to present under that lecture series. That was in
20 1998.

21 I presented to the department of genetics at the
22 University of Georgia in February of 1998; the
23 department of biochemistry at the University of
24 Minnesota, May 1998; the department of chemistry and
25 biochemistry at the University of South Carolina in

1 1999; and at the University of Massachusetts, there was
2 a panel discussion held with Professor Lynn Margulis.

3 Lynn Margulis is a very prominent biologist, a
4 member of the National Academy of Sciences, who has
5 questioned aspects of Darwin's theory. She and I gave
6 15 minute presentations, and then there was a panel
7 discussion with a number of panelists, which included
8 the chancellor of the university, David Scott. It was
9 presented in front of an audience of about 1000 members
10 of the university community.

11 Q. Again, in these discussions and seminars that
12 we're going to be reviewing here, you're arguing
13 regarding the scientific evidence for intelligent
14 design, is that correct?

15 A. That's correct, yes. Next slide, please. 1999,
16 I gave a presentation at the department of biochemistry
17 at the Mayo Clinic; in April of that year, I talked to
18 the Brooklyn section of the American Chemical Society.

19 Q. What is that?

20 A. Well, the American Chemical Society is the
21 largest organization of professional chemists in the
22 country, and they have, of course, many local sections.
23 And the invitation for this was from the Brooklyn
24 section of the ACS.

25 Q. Continue, please.

1 A. One of the members of the ACS in Brooklyn is also
2 on the faculty of the department of chemistry at a place
3 called Saint Francis College in Brooklyn, and I also
4 then spoke the next day to the department of philosophy
5 at Saint Francis College. I spoke in the summer of 1999
6 to a Gordon Research Conference on organic reactions and
7 processes.

8 Gordon Research Conferences are very prominent
9 meetings of scientists on very many different topics.
10 And oftentimes, they're usually attended by between 100
11 and 200 scientists. And I received an invitation to
12 speak in front of this group. In February of the year
13 2000, I was invited by an organization called the Royal
14 Society of Medicine, which is in England, to speak at
15 something called an -- a conference on evolution and
16 Darwinian medicine.

17 The Royal Society of Medicine is an organization
18 of physicians and scientists in England that sponsors a
19 large number of conferences. This particular conference
20 was focused on, as its title suggests, what evolution,
21 and in particular, Darwinian theory has to say about
22 diseases and medicine.

23 I debated and discussed the topic of Darwinian
24 evolution and design with a man named Robert Fowley, who
25 was a paleontologist and a member of the Royal Society

1 in England, which the Royal Society is akin to the
2 National Academy of Sciences in the United States.

3 The next one. In April of the year 2000, I gave
4 a plenary lecture to a conference that was held at
5 Baylor University entitled The Nature of Nature
6 Conference.

7 Q. Who participated in that conference?

8 A. This was a large conference with, I think,
9 50'ish, 50 or so invited speakers in it. It was one of
10 the most eminent conferences that I have ever been to.
11 The topic was The Nature of Nature. It was very widely
12 construed.

13 There were academicians there from a large
14 variety of different disciplines. There were physicists
15 there, such as Alan Guth (phonetic), who is a member of
16 the National Academy of Sciences and a professor of
17 physics at MIT, discussing the nature of the universe,
18 whether the universe is eternal, whether it is
19 undergoing something that he calls inflation, or whether
20 it began in time.

21 There were conversations on that. There were
22 philosophers who discussed the question of whether the
23 mind is a physical object or whether it is not. There
24 were mathematicians there to discuss the topic of
25 whether the fit between mathematical theory and nature,

1 which seems to, many of them, to be uncanny is
2 unreasonable to expect or whether it is reasonable.

3 And, of course, there were also people there
4 discussing Darwin's theory of evolution and intelligent
5 design. I participated in a session on biochemistry and
6 design and Darwinian evolution. And if I recall the
7 order correctly, the first speaker in my session --
8 there were four speakers.

9 The first speaker was a man named Simon Conway
10 Morris, who is a paleontologist at Oxford University in
11 England and a fellow of the Royal Society. Again, a
12 fellow of the Royal Society is akin to a member of the
13 National Academy of Sciences in the United States.

14 And I think afterwards, I presented. And then I
15 think up next was a man named Mark Tashney, who is a
16 biology professor at Memorial Sloan-Kettering Medical
17 Center in New York City. And he is a member of the
18 National Academy of Sciences in the United States and
19 also a biochemist.

20 And the last person speaking in our session was a
21 man named Christian DeDuve, who is a Nobel Prize winner
22 and also a biochemist who teaches at the Catholic
23 University of Louvan in Belgium.

24 Q. Now we heard testimony in this case, I believe it
25 was from Dr. Forrest, and she described that conference

1 as a creationist conference. How do you respond to
2 that?

3 A. Well, it would surprise many of the speakers
4 there. I would say that, that's simply ludicrous. And
5 I think it says more about the person making such a
6 comment than it does about the conference itself.

7 Q. Let's go to the next slide. In here, you have a
8 few underlined in red. What is the purpose of that?

9 A. Yes, I put in red conferences in which other
10 expert witnesses who are going to be testifying at this
11 trial have participated. For example, in the summer of
12 the year 2000, there was a conference held at a place
13 called Concordia College in Wisconsin, which includes
14 myself, Ken Miller, and Scott Minnich, who, I think,
15 will be up later.

16 In the fall of 2000, I presented a lecture at
17 Catholic University on the general title Fides et Ratio
18 and Scientific Inquiry. Fides et Ratio is the title of
19 an encyclical which was written by Pope John Paul, II,
20 and this was a commentary on the encyclical plus a
21 commentary on the relationship of science and religion.

22 Q. Fides et Ratio means faith and reason?

23 A. Yes, that's right. It's Latin for faith and
24 reason.

25 Q. I believe the encyclical, was that what Dr. Miller

1 had referred to or testified to?

2 A. Yes, I heard him mention the encyclical in his
3 testimony.

4 Q. Continue, please.

5 A. I presented at the department of biology at
6 Wilkes University, which is, of course, close to
7 Bethlehem at the invitation of a former student in the
8 department of biology at Lehigh, who is now on the
9 faculty there; Los Alamos National Laboratories in March
10 of 2000; I participated again in a conference at
11 Haverford College, which was sponsored by the American
12 Association for the Advancement of Science. And they
13 title it Interpreting Evolution. And I spoke there
14 along with Ken Miller and also Warren Nord, who, I
15 believe, is going to testify in this trial.

16 Q. So the American Association for the Advancement
17 of Science put on a seminar entitled Interpreting
18 Evolution, and you were permitted to be one of the
19 speakers there?

20 A. I was invited, not just permitted.

21 Q. Okay. Continue.

22 A. I spoke with the deans of the medical school at
23 the University of New Mexico. I presented at a meeting
24 of the Protein Society in Philadelphia. That doesn't
25 have a date there. But that was also in the year 2002.

1 Q. Now was that presentation related to that article
2 that you wrote with David Snoke?

3 A. Yes, that's correct. This was a presentation,
4 actually a poster session, which laid out the data and
5 the ideas which would later be written up and sent out
6 and published as that paper.

7 Q. And this is one of those professional
8 organization's annual meetings?

9 A. Yes, that's right. This is a meeting of the
10 Protein Society. I guess there was about a thousand
11 people there. It was presented in something called a
12 poster session, like many other presentations there.

13 Q. Next slide.

14 A. In the spring of the of the year 2002, the
15 American Museum of Natural History in New York City
16 sponsored a panel discussion and debate between my --
17 with myself and William Dembski on one side speaking of
18 intelligent design, and Kenneth Miller and Robert
19 Pennock on the other side advocating Darwinian
20 evolution. This was well attended. Several hundred
21 people, scientists, members of the community.

22 In the fall of the year 2002, a man named William
23 Provine, who is a professor of the history of science
24 and also a revolutionary biologist at Cornell University
25 invited me to come and present a lecture to his

1 introductory class on evolutionary biology.

2 Q. And who is -- is Professor Provine an intelligent
3 design advocate?

4 A. No. Professor Provine is a very, very strong
5 advocate of Darwinian evolution.

6 Q. He invited you though to come up and give a
7 presentation to his biology class at Cornell University?

8 A. That's right. I gave an entire lecture of 45 to
9 50 minute lecture, I believe.

10 Q. Did he explain to you why he wanted you to come
11 on up?

12 A. Yes.

13 MR. ROTHSCHILD: Objection, hearsay.

14 MR. MUISE: Your Honor, he's going to
15 explain why he came up and his understanding as to why
16 he was given the presentation.

17 MR. ROTHSCHILD: Exactly my objection.

18 THE COURT: I'll allow it. I'll overrule
19 the objection.

20 THE WITNESS: His stated purpose was that he
21 wanted students in the class to hear an alternative view
22 to Darwinian evolution so that they could better make up
23 their minds which they thought was more accurate.

24 BY MR. MUISE:

25 Q. Apparently, he didn't consider this was going to

1 cause some harm to his students?

2 A. No, his opinion --

3 MR. ROTHSCHILD: Objection.

4 THE COURT: Sustained. Sustained.

5 BY MR. MUISE:

6 Q. Go to the next one, please.

7 A. Yes, there's a college called Hillsdale College
8 in Michigan. They sponsor a lecture series for their
9 students every year in something called the Center for
10 Constructive Alternatives. They sponsored a lecture
11 series on intelligent design. And I was one of the
12 participants.

13 Chestnut Hill College in Philadelphia, they have
14 a lectureship for students who are going to enter
15 biomedical professions. I was invited to speak before
16 that group. I was invited to speak before the
17 department of department of biochemistry and biophysics
18 at the University of California, San Francisco, in the
19 year of 2003.

20 In 2004, the Claremont-McKenna College in
21 California has a lecture series called the Atheneum
22 series, and in that year, it was a series on intelligent
23 design. I spoke at that. And, I believe, later on,
24 Eugenia Scott spoke in the same series, and Professor
25 Scott -- or Dr. Scott is a, I think, the director of the

1 National Center for Science Education.

2 Q. Now you made -- now these are presentations that
3 were given to academic groups, scientific groups, is
4 that correct?

5 A. Yes, these are specifically ones before academic
6 groups.

7 Q. Focused principally on areas of science, is that
8 correct?

9 A. Yes, that's correct.

10 Q. You also made presentations in other settings, is
11 that correct?

12 A. Yes. I've given a number of other lecture as
13 well before most any group that would invite me,
14 including many student groups.

15 Q. You gave a presentation at Dover High School, is
16 that correct?

17 A. Yes, in the spring of this year, I gave a seminar
18 in Dover High School.

19 Q. Now you're a member of the American Society for
20 Biochemistry and Molecular Biology, correct?

21 A. Yes, that's right.

22 Q. Now Plaintiffs' experts, and Dr. Forrest, and Dr.
23 Miller have criticized you for not taking the
24 opportunity to present your argument for intelligent
25 design at the Society's annual meetings. How do you

1 respond to that criticism?

2 A. Well, I think it's disingenuous for a couple of
3 reasons. The first reason -- all three reasons, let's
4 put it that way. I'm a member of the Protein Society,
5 and I did present my work before a meeting in the
6 Protein Society in the year 2002, I believe.

7 Number 2, Professor Miller and I appeared on a
8 show called Firing Line on the public broadcasting
9 system that was hosted by William Buckley at that point
10 to debate and discuss the topic of evolution and
11 intelligent design. And on that show, Professor Miller
12 said --

13 MR. ROTHSCHILD: Objection, Your Honor,
14 hearsay.

15 MR. MUISE: Your Honor, it's going directly
16 to the point -- I mean, you'll understand when he
17 continues his testimony that they had a joint agreement.
18 They submitted a joint request to do this. And this was
19 denied. So, I mean, Dr. Miller had -- he's recounting a
20 conversation he had with Dr. Miller, which is going to
21 explain the actions that he took.

22 THE COURT: What joint agreement?

23 MR. MUISE: Your Honor, he's responding to
24 -- Plaintiffs' experts have criticized and particularly
25 criticized him --

1 THE COURT: I understand what you're doing,
2 but he's about to recite something that Dr. Miller said
3 on Firing Line that sounds to me like it's going to be
4 hearsay.

5 MR. MUISE: No, Your Honor, it's going to
6 explain subsequent actions. It's going to be like if
7 somebody said, you know, I went to the store because he
8 asked me to go to the store. It's explaining subsequent
9 conduct.

10 THE COURT: Where is that in the hearsay
11 exceptions? Is it a present sense impression?

12 MR. MUISE: It explains his actions, Judge.
13 It explains why he's done, why he's going to take the
14 actions that he did. You'll get Dr. Miller complaining
15 that they're not presenting. He challenges them.
16 That's all he's going to testify to. And he's going to
17 testify that they wrote a joint letter and submitted it
18 off. It explains the purpose of the joint letter.

19 THE COURT: He can say that they wrote a
20 joint letter. I understand that. That's not what he's
21 about to do. He's about to apparently quote Dr. Miller,
22 Professor Miller chapter and versus what he said. I'll
23 sustain the objection.

24 MR. ROTHSCHILD: And the letter hasn't been
25 produced either, Your Honor.

1 THE COURT: Well, we'll get to that. Let's
2 not anticipate what we don't have. I'll sustain the
3 objection to that question.

4 BY MR. MUISE:

5 Q. Have you been challenged to give a presentation
6 at one of these annual meetings?

7 A. Yes, I have.

8 Q. Who challenged you?

9 A. Professor Ken Miller.

10 Q. How did you respond to that challenge?

11 A. I said I'd be delighted to make a presentation
12 before any group of scientists.

13 Q. Did you follow that up, take any action on that?

14 A. Yes, I did. I co-signed a letter with Professor
15 Miller addressed to the Presidents of the American
16 Society for Biochemistry and Molecular Biology and also
17 the American Society of Cell Biology, proposing that at
18 their next meetings, they --

19 MR. ROTHSCHILD: Objection, Your Honor.

20 THE WITNESS: Sponsor --

21 THE COURT: Hold on.

22 MR. ROTHSCHILD: The letter hasn't been
23 produced, and I do think it's hearsay. I mean, if he
24 has it and can, you know, read it into evidence, that's
25 one thing. But, first of all, it's another declarant

1 that he's effectively taking credit here for, Ken
2 Miller, and we don't have a letter to cross-examine.

3 THE COURT: He says he was a co-author of
4 the letter. He's paraphrasing the letter. He's not
5 reading from it.

6 MR. MUISE: In fact, it's a greater
7 objection to read from the actual letter than from him
8 to explain.

9 THE COURT: I think that would be a problem.
10 No, I'll overrule the objection. If he is summarizing
11 or paraphrasing the letter, which he is the co-author
12 of, I'll overrule the objection, and you may proceed.

13 MR. ROTHSCHILD: I also have an objection.
14 We haven't been produced the letter, which deprives us
15 of the opportunity to cross-examine.

16 MR. MUISE: Your Honor, I mean, they had an
17 opportunity to request any of the documents that they
18 wanted to request. There's no -- there's been total
19 disclosure in this particular case. There's been a lot
20 of documents that's been gone back and forth.

21 THE COURT: I bet that letter is readily
22 available, and I'm going to further bet that we're not
23 going to finish with this witness today. Why don't you
24 get the letter -- I'm not -- I've overruled the
25 objection. But I think it's a fair request, that if

1 some of the testimony is predicated on the letter and
2 the summary of the letter, that that be produced. I
3 don't think that's a hardship to ask that the letter be
4 produced.

5 MR. ROTHSCHILD: Your Honor, this certainly
6 was not part of, in any way part of his expert report or
7 a rebuttal report, to the best of my recollection.

8 THE COURT: Are you objecting that it's
9 beyond the scope of his expert report?

10 MR. ROTHSCHILD: Well, I do think it's
11 beyond the scope, but the greater concern is, you know,
12 Mr. Muise is suggesting that, you know, we somehow
13 missed out on our chance to discover this in advance of
14 testimony.

15 THE COURT: I've cured that. I've asked
16 that he produce the letter, so I'm going to -- let's
17 proceed. Let's move on. Were we in mid answer when we
18 got the objection?

19 MR. MUISE: He was in the middle, Your
20 Honor.

21 THE COURT: I think you were in the middle,
22 Professor, of summarizing the contents of the letter,
23 and you can proceed with your answer, wherever you left
24 off, if you would like.

25 THE WITNESS: We wrote a letter proposing a

1 symposium at the annual meeting of the societies. We
2 sent it off and received an acknowledgment that it had
3 been received, but then no further action from the
4 societies. And furthermore, I think that, the original
5 question --

6 BY MR. MUISE:

7 Q. Regarding the criticism. I believe you answered
8 there were three points you wanted to make, and you've
9 made two. I think this is the third point?

10 A. The third point is that, one has to understand
11 the structure of meetings to see why they may not be the
12 best place to present such ideas. As I mentioned
13 before, large national scientific meetings have many
14 people, but generally most presentations are made as
15 what are called poster presentations, where you get a
16 large poster board, tape up figures and text on it, and
17 go into a large hall with hundreds of other scientists,
18 and display your poster.

19 People wander by and look at it, and can either
20 read it by themselves or continue on or they can stop
21 and talk with you a bit. But it is not a place for a
22 sustained conversation, a sustained discussion about
23 topics such as intelligent design which require a lot of
24 preliminary background, explanation, and so on.

25 Rather, the seminars and discussions that I've

1 just gone through are, in my opinion, much better forums
2 for presenting such material, because generally you can
3 speak continuously for 50 minutes to an hour.

4 There are generally 20 to hundreds of other
5 scientists, active admissions, and so on, who are
6 listening quite closely to the argument you are making
7 and who can respond with discussion and questions and
8 counter arguments of their own. So I view it as a much
9 better forum than a large national meeting.

10 Q. Sir, I'd like to refer you back to your CV. It's
11 Defendants' Exhibit 249. I want to review some of the
12 additional articles or writings that you have done
13 relating to the topics of intelligent design and
14 evolution and defending intelligent design against
15 claims such as it's religion and it's not science and so
16 forth.

17 If you look at your CV under publications,
18 there's one published in 2004, a chapter entitled
19 Irreducible Complexity, Obstacles to Darwinian
20 Evolution. And that was a chapter you wrote for a
21 particular book, correct?

22 A. Yes, that's right. It appeared in a book called
23 Debating Design, From Darwin to DNA, which was edited by
24 a man named Michael Ruse, who is a philosopher of
25 biology and a strong proponent of Darwinism and a man

1 named William Dutsky, who is a proponent of intelligent
2 design, and it was published by Cambridge University
3 Press.

4 Q. I believe, if you look at the exhibits that have
5 been provided to you, that chapter is included on the
6 tab 7 as Defendants' Exhibit 203-I under tab 7. If you
7 could verify that for me, please?

8 A. Yes, that's correct.

9 Q. Were there opponents of intelligent design that
10 contributed chapters to that book?

11 A. Yes. It was debating design. That included
12 proponents of intelligent design, of Darwinian
13 evolution, of something called self-organization and
14 complexity theory, a wide range of viewpoints.

15 Q. Was Dr. Miller one of the people that contributed
16 a chapter of that book?

17 A. Yes, he also contributed a chapter.

18 Q. If you go down to the next publication on your
19 curriculum vitae, there's a chapter written in 2003
20 entitled Design and Details, The Origin of Biomolecular
21 Machines, close quote. And that was published in a
22 particular book?

23 A. Yes, it was. It was published in a book called
24 Darwinism, Design and Public Education, which was
25 published by Michigan State University Press. I

1 contributed a chapter to that as well.

2 Q. Were there again competing arguments, arguing
3 intelligent design and teaching it in schools and so
4 forth?

5 A. Yes, that's right. Again, this was a companion
6 book which had many different viewpoints.

7 Q. And further down your CV, in 2003, you
8 contributed a chapter entitled The Modern Intelligent
9 Design Hypothesis, Breaking Rules, is that correct?

10 A. Yes, that's right. Again, this was a collection
11 of essays published by Routledge Press, which also
12 contributed -- contained a contribution by Professor
13 Miller.

14 Q. And that book was edited by Neil Manson?

15 A. Yes, he's a philosopher of science.

16 Q. If you go to the next page in your curriculum
17 vitae, you have an article in Natural History, is that
18 correct?

19 A. Yes, that's right, entitled The Challenge of
20 Irreducible Complexity.

21 Q. That was published in 2002?

22 A. That's correct. This was part of a section in
23 the issue of the magazine which kind of was associated
24 with the discussion and debate that they sponsored, that
25 the American Museum of Natural History sponsored. The

1 American Museum of Natural History is the publisher of
2 Natural History. It contain contributions from myself,
3 William Dembskie, and Robert Pennock and Kenneth Miller,
4 as well as several others.

5 Q. Going down again in your curriculum vitae, there
6 was a chapter you contributed to a book by another one
7 of Plaintiffs' experts, Robert Pennock, and the chapter
8 was entitled Molecule, Machines, Experimental Support
9 for the Design?

10 A. Well, it's called Molecular Machines.

11 Q. Sorry.

12 A. It was published by MIT Press, yes.

13 Q. And if you go down further on that page in your
14 -- I'm sorry. Go to the next page of your curriculum
15 vitae. I believe it's page 4. It appears there's an
16 article, Self-organization and Irreducibly Complex
17 Systems, A Reply to Shanks and Joplin. Do you see that?

18 A. Yes, that's correct. That --

19 Q. I'm sorry.

20 A. I'm sorry. That was published in a journal
21 called Philosophy of Science, which is a very
22 prestigous journal in its field. And in it, I respond
23 to objections to the concept of irreducible complexity
24 which were advanced by a man named Neil Shanks, who is a
25 philosopher, and Carl Joplin, who is a biologist, and

1 argued why their objections were incorrect.

2 Q. If you look again at your exhibit book, I believe
3 under tab 4, it's marked as Defendants' Exhibit 203-G?

4 A. Yes.

5 Q. Is that the article you are referring to?

6 A. Yes, it is.

7 Q. And then down further on that page, you
8 contributed an article in 1998 to Rhetoric and Public
9 Affairs, is that correct?

10 A. Yes, that's right, entitled Intelligent Design as
11 an Alternative Explanation for the Existence of
12 Biomolecular Machines.

13 Q. And I believe one more. If you turn over to page
14 6, at the top, there's a contribution to the Boston
15 Review in 1997. Do you see that?

16 A. Yes, I do.

17 Q. What was that?

18 A. Well, Boston Review is actually a publication of
19 the Massachusetts Institute of Technology, I believe,
20 their political science department or some such thing.
21 They had a review of my book, Darwin's Black Box,
22 published or written by a man named Alan Orr, who is a
23 professor of evolutionary biology at the University of
24 Rochester.

25 And after his review, they invited contributions,

1 further discussion by, I think, around a dozen
2 academics, from a dozen academics or so. And the
3 symposium was discussing my book and also a book that
4 was published recently by a man named Richard Dawkins,
5 who is a professor of evolutionary biology at Oxford in
6 England.

7 And it included contributions from myself, from a
8 man named Russell Doolittle, who is a professor of
9 biochemistry at the University of California, San Diego,
10 a man named James Shapiro, who is at the University of
11 Chicago, and many others.

12 Q. And I believe you also have contributed three
13 pieces that were actually published in the New York
14 Times, is that correct?

15 A. Yes, that's right. They called me up and asked
16 me to write about my ideas in, I think, in 1996, 1999,
17 and this year as well.

18 Q. So the New York Times solicited your ideas on
19 intelligent design?

20 A. That's correct.

21 Q. Is it fair to say that in these writings and in
22 these conferences that we've just gone through, that
23 you've been defending your arguments, you've been
24 defending the scientific argument for intelligent
25 design, as well as defending against arguments that it's

1 creationism?

2 A. Yes, I've done that continuously.

3 Q. And again, arguing the scientific evidence in
4 support for intelligent design?

5 A. That's correct.

6 Q. And were you also arguing with regard to the
7 perhaps lack of scientific evidence for some aspects of
8 Darwin's theory of evolution?

9 A. Yes, I argued that as well.

10 MR. MUISE: Your Honor, may it please the
11 Court, I tender Dr. Michael Behe as an expert in
12 biochemistry, evolution, intelligent design,
13 creationism, and science education.

14 MR. ROTHSCHILD: I'm not sure he was ever
15 actual previously proffered as an expert on science
16 education.

17 THE COURT: All right. Let's handle
18 biochemistry, evolution, intelligent design, and
19 creationism. Any objection there?

20 MR. ROTHSCHILD: No, Your Honor.

21 THE COURT: All right. Do you know if you
22 have any objection with respect to science education?

23 MR. ROTHSCHILD: I mean, he was not tendered
24 as an expert in science education. I'm not sure what
25 the basis of his expertise is in science education. I

1 mean, I understand he teaches, but --

2 THE COURT: Do you want to ask him some
3 questions?

4 MR. ROTHSCHILD: Yes.

5 THE COURT: I think it's probably an
6 appropriate time for a break.

7 MR. MUISE: I was kind of timing it to that,
8 Your Honor, looking at that. But if I may say, we have
9 a stipulation that they're qualified to testify as to
10 their opinions that are in their reports, and he
11 certainly is opined about the value of Pandas and of
12 intelligent design to be part of the science curriculum.
13 I mean, it's fairly embraced by that. And we have a
14 stipulation on this, so it's kind of surprising that
15 he's objecting.

16 THE COURT: Why don't you talk about that
17 during the break and see if it triggers the need for any
18 voir dire on qualifications, specifically on science
19 education, and if it does, we'll hear that. If it's
20 fairly encompassed within the stipulation and it does
21 not, then we'll admit him for that purpose. He's
22 certainly admitted for the other purposes then based on
23 the stipulation and the fact that there's no objection.

24 We'll reserve judgment on the science
25 education. Although, you know, I will say that, it

1 seems fairly contemplated within his report, but I'm not
2 sure what the essence of your stipulation was, so I
3 recognize that you reserve your right to conduct some
4 voir dire if you see the need to do it, and I'll hear
5 you on that after we return.

6 So let's break for 20 minutes. We'll return
7 after that period, and we'll see what your pleasure is
8 with respect to the expert qualifications. We'll be in
9 recess.

10 (Whereupon, a recess was taken at 10:40 a.m.
11 and proceedings reconvened at 11:00 a.m.)

12 THE COURT: All right. What's your pleasure
13 with respect to the last qualification?

14 MR. ROTHSCHILD: Your Honor, we'll withdraw
15 the objection and save the questions for cross.

16 THE COURT: All right. He's admitted then
17 for the purposes as stated by Mr. Muise, and you may
18 proceed.

19 MR. MUISE: Thank you, Your Honor.

20 **DIRECT EXAMINATION**

21 BY MR. MUISE:

22 Q. Dr. Behe, I first want to review with you the
23 opinions you tend to offer in this case before we get to
24 the basis of those opinions, okay?

25 A. Yes.

1 Q. Sir, do you have an opinion as to whether
2 intelligent design is science?

3 A. Yes, I do.

4 Q. And what is that opinion?

5 A. Yes, it is.

6 Q. Do you have an opinion as to whether intelligent
7 design makes testable scientific claims?

8 A. Yes, I do.

9 Q. What is that opinion?

10 A. Yes, it does.

11 Q. Do you have an opinion as to whether intelligent
12 design posits a positive argument for design?

13 A. Yes, I do.

14 Q. What is that opinion?

15 A. Yes, it does.

16 Q. Do you have an opinion as to whether intelligent
17 design requires the action of a supernatural creator?

18 A. Yes, I do.

19 Q. And what is that opinion?

20 A. No, it doesn't.

21 Q. Do you have an opinion as to whether intelligent
22 design is young-earth creationism?

23 A. Yes, I do.

24 Q. What is that opinion?

25 A. No, it isn't.

1 Q. Do you have an opinion as to whether intelligent
2 design is old-earth creationism?

3 A. Yes, I do.

4 Q. And, sir, what is that opinion?

5 A. No, it isn't.

6 Q. Do you have an opinion as to whether intelligent
7 design is special creationism?

8 A. Yes, I do.

9 Q. And what is that opinion?

10 A. No, it isn't.

11 Q. Do you have an opinion as to whether intelligent
12 design is a religious belief?

13 A. Yes, I do.

14 Q. What is that opinion?

15 A. No, it isn't.

16 Q. Do you have an opinion as to whether Darwin's
17 theory of evolution is a fact?

18 A. Yes, I do.

19 Q. What is that opinion?

20 A. No, it isn't.

21 Q. Do you have an opinion as to whether there are
22 gaps and problems with Darwin's theory of evolution?

23 A. Yes, I do.

24 Q. What is that opinion?

25 A. Yes, there are.

1 Q. Do you have an opinion as to whether making
2 students aware that Darwin's theory is not a fact
3 promotes good science education?

4 A. Yes, I do.

5 Q. What is that opinion?

6 A. Yes, it does.

7 Q. Do you have an opinion as to whether making
8 students aware of gaps and problems with Darwin's theory
9 of evolution promotes good science education?

10 A. Yes, I do.

11 Q. What is that opinion?

12 A. Yes, it does.

13 Q. Do you have an opinion as to whether making
14 students aware of intelligent design promotes good
15 science education?

16 A. Yes, I do.

17 Q. And what is that opinion?

18 A. Yes, it does.

19 Q. And, sir, do you have an opinion as to whether
20 providing students with the opportunity to review the
21 book Of Pandas and People promotes good science
22 education?

23 A. Yes, I do.

24 Q. What is that opinion?

25 A. Yes, it does.

1 Q. Sir, what is intelligent design?

2 A. Intelligent design is a scientific theory that
3 proposes that some aspects of life are best explained as
4 the result of design, and that the strong appearance of
5 design in life is real and not just apparent.

6 Q. Now Dr. Miller defined intelligent design as
7 follows: Quote, Intelligent design is the proposition
8 that some aspects of living things are too complex to
9 have been evolved and, therefore, must have been
10 produced by an outside creative force acting outside the
11 laws of nature, end quote. Is that an accurate
12 definition?

13 A. No, it's a mischaracterization.

14 Q. Why is that?

15 A. For two reasons. One is, understandable, that
16 Professor Miller is viewing intelligent design from the
17 perspective of his own views and sees it simply as an
18 attack on Darwinian theory. And it is not that. It is
19 a positive explanation.

20 And the second mischaracterization is that,
21 intelligent design is a scientific theory. Creationism
22 is a religious, theological idea. And that intelligent
23 design is -- relies rather on empirical and physical and
24 observable evidence plus logical inferences for its
25 entire argument.

1 Q. Is intelligent design based on any religious
2 beliefs or convictions?

3 A. No, it isn't.

4 Q. What is it based on?

5 A. It is based entirely on observable, empirical,
6 physical evidence from nature plus logical inferences.

7 Q. Dr. Padian testified that paleontologists makes
8 reasoned inferences based on comparative evidence. For
9 example, paleontologists know what the functions of the
10 feathers of different shapes are in birds today. They
11 look at those same structures in fossil animals and
12 infer that they were used for a similar purpose in the
13 fossil animal. Does intelligent design employ similar
14 scientific reasoning?

15 A. Yes, that's a form of inductive reasoning, and
16 intelligent design uses similar inductive reasoning.

17 Q. Now I want to review with you the intelligent
18 design argument. Have you prepared a slide for this?

19 A. Yes, I have. On the next slide is a short
20 summary of the intelligent design argument. The first
21 point is that, we infer design when we see that parts
22 appear to be arranged for a purpose. The second point
23 is that the strength of the inference, how confident we
24 are in it, is quantitative. The more parts that are
25 arranged, and the more intricately they interact, the

1 stronger is our confidence in design. The third point
2 is that the appearance of design in aspects of biology
3 is overwhelming.

4 The fourth point then is that, since nothing
5 other than an intelligent cause has been demonstrated to
6 be able to yield such a strong appearance of design,
7 Darwinian claims notwithstanding, the conclusion that
8 the design seen in life is real design is rationally
9 justified.

10 Q. Now when you use the term design, what do you
11 mean?

12 A. Well, I discussed this in my book, Darwin's Black
13 Box, and a short description of design is shown in this
14 quotation from Chapter 9. Quote, What is design?
15 Design is simply the purposeful arrangement of parts.
16 When we perceive that parts have been arranged to
17 fulfill a purpose, that's when we infer design.

18 Q. Can you give us a biochemical example of design?

19 A. Yes, that's on the next slide. I think the best,
20 most visually striking example of design is something
21 called the bacterial flagellum. This is a figure of the
22 bacterial flagellum taken from a textbook by authors
23 named Voet and Voet, which is widely used in colleges
24 and universities around the country. The bacterial
25 flagellum is quite literally an outboard motor that

1 bacteria use to swim. And in order to accomplish that
2 function, it has a number of parts ordered to that
3 effect.

4 This part here, which is labeled the filament, is
5 actually the propeller of the bacterial flagellum. The
6 motor is actually a rotary motor. It spins around and
7 around and around. And as it spins, it spins the
8 propeller, which pushes against the liquid in which the
9 bacterium finds itself and, therefore, pushes the
10 bacterium forward through the liquid.

11 The propeller is attached to something called the
12 drive shaft by another part which is called the hook
13 region which acts as a universal joint. The purpose of
14 a universal joint is to transmit the rotary motion of
15 the drive shaft up from the drive shaft itself through
16 the propeller. And the hook adapts the one to the
17 other.

18 The drive shaft is attached to the motor itself
19 which uses a flow of acid from the outside of the cell
20 to the inside of the cell to power the turning of the
21 motor, much like, say, water flowing over a dam can turn
22 a turbine. The whole apparatus, the flagellum has to be
23 kept stationary in the plane of the bacterial membrane,
24 which is represented by these dark curved regions.

25 As the propeller is turning, much as an outboard

1 motor has to be clamped onto a boat to stabilize it
2 while the propeller is turning. And there are regions,
3 parts, protein parts which act as what is called a
4 stator to hold the apparatus steady in the cell.

5 The drive shaft has to traverse the membrane of
6 the cell. And there are parts, protein parts, which
7 are, which act as what are called bushing materials to
8 allow the drive shaft to proceed through. And I should
9 add that, although this looks complicated, the actual --
10 this is really only a little illustration, a kind of
11 cartoon drawing of the flagellum. And it's really much
12 more complex than this.

13 But I think this illustration gets across the
14 point of the purposeful arrangement of parts. Most
15 people who see this and have the function explained to
16 them quickly realized that these parts are ordered for a
17 purpose and, therefore, bespeak design.

18 Q. If I could just direct your attention again to
19 the exhibit book. In tab 5, there's a Defense Exhibit
20 marked 203-B, as in bravo?

21 A. Yes.

22 Q. And is that a depiction of the bacterial
23 flagellum from the same textbook as we see up here in
24 the demonstrative?

25 A. Yes, it is.

1 Q. That's a fair an accurate depiction of the
2 bacterial flagellum?

3 A. Yes, it is.

4 Q. Now does the conclusion that something was
5 designed, does that require knowledge of a designer?

6 A. No, it doesn't. And if you can advance to the
7 next slide. I discussed that in Darwin's Black Box in
8 Chapter 9, the chapter entitled Intelligent Design. Let
9 me quote from it.

10 Quote, The conclusion that something was designed
11 can be made quite independently of knowledge of the
12 designer. As a matter of procedure, the design must
13 first be apprehended before there can be any further
14 question about the designer. The inference to design
15 can be held with all the firmness that is possible in
16 this world, without knowing anything about the designer.

17 Q. So is it accurate for people to claim or to
18 represent that intelligent design holds that the
19 designer was God?

20 A. No, that is completely inaccurate.

21 Q. Well, people have asked you your opinion as to
22 who you believe the designer is, is that correct?

23 A. That is right.

24 Q. Has science answered that question?

25 A. No, science has not done so.

1 Q. And I believe you have answered on occasion that
2 you believe the designer is God, is that correct?

3 A. Yes, that's correct.

4 Q. Are you making a scientific claim with that
5 answer?

6 A. No, I conclude that based on theological and
7 philosophical and historical factors.

8 Q. Do you consider your response to that question
9 any different than Dr. Miller's response that he
10 believes God is the author of the laws of nature that
11 make evolution work?

12 A. No, in my view, they're quite similar, yes.

13 Q. Have other scientists acknowledged these design
14 features of the flagellum?

15 A. Yes, they have. And if you advance to the next
16 slide. In 1998, a man named David DeRosier wrote an
17 article in the journal Cell, which is a very prestigious
18 scientific journal entitled The Turn of the Screw, The
19 Bacterial Flagellar Motor. David DeRosier is a
20 professor of biology at Brandeis University in
21 Massachusetts and has worked on the bacterial flagellar
22 motor for most of his career.

23 In that article, he makes the statement, quote,
24 More so than other motors, the flagellum resembles a
25 machine designed by a human, close quote. So David

1 DeRosier also recognizes that the structure of the
2 flagellum appears designed.

3 Q. Again, sir, if I could direct your attention to
4 the exhibit book, under Tab 18, there is an exhibit
5 marked Defendants' Exhibit 274. Is that the article
6 from Dr. DeRosier that you've been referring to?

7 A. Yes, that's it.

8 Q. And I believe we have additional quotes from that
9 article, is that correct?

10 A. Yes, that's right. On the next slide, I quote a
11 paragraph from the article to show that Professor
12 DeRosier not only says it looks like a machine, he
13 treats it as a real machine, as a real machine, not as a
14 metaphorical machine. Let me just read the quotation
15 from the article.

16 Quote, In E. Coli and S. typhimurium, flagella
17 turning at speeds of 18,000 rpm push cells at 30 microns
18 per second, but the speed records are set by motors in
19 other bacteria that turn at rates exceeding 100,000 rpm
20 and push cells at hundreds of micrometers per second.
21 What is all the more remarkable is that flagellar motors
22 can run in both directions, that is clockwise and
23 counterclockwise. These motors also deliver a constant
24 torque of 4500 piconewton nanometers at speeds over 6000
25 rpm.

1 And if you continue onto the next slide, he has a
2 table in the article listing mechanical properties of
3 this structure. Table 1 is entitled Statistics for
4 Flagellar Motors of *S. typhimurium*/*E. coli* versus
5 Myosin, Kinesin, and -- I can't read the rest. And he
6 writes, he lists values for the rotational speed, the
7 linear speed, the torque of the motor, the force it
8 generates, and the efficiency of the motor.

9 And if you look under the efficiency of the
10 motor, he says that it's unknown, but the efficiency
11 could be upwards of -- it could be approaching 100
12 percent, which would make it the most efficient motor in
13 the universe.

14 Q. So these are machine like properties?

15 A. Yes, they are, and he treats them as such.

16 Q. Now you indicated that he used the term machine.
17 I believe Dr. Miller had testified that it's just a
18 metaphor. Do you agree?

19 A. No, I completely disagree. Biologists routinely
20 talk about machines in the cell, and they use the term
21 literally not metaphorically.

22 Q. Is the bacterial flagellum the only machine in
23 the cell?

24 A. No. The flagellum, while a good visual example,
25 is just one example of molecular machines in the cell.

1 The cell is chockful of molecular machines.

2 Q. Have you prepared some slides to demonstrate that
3 point?

4 A. Yes, I have. The next slide is showing the cover
5 of an issue of the journal Cell from the year 1998.
6 Then they issued a special review issue on the topic of
7 macromolecular machines, molecular machines. And can I
8 draw your attention down to the lower left-hand corner
9 of the figure where the artist who prepared the drawing
10 illustrates something that resembles a watch or some
11 sort of mechanical object, apparently to convey the
12 topic of machinery.

13 Q. Go ahead. I'm sorry.

14 A. Let me continue. If you advance to the next
15 slide, I have a photocopy of the table of contents of
16 the journal Cell. And on the next slide, the first
17 seven articles in this special issue on molecular
18 machines are listed. I'd like to read the titles of
19 some of those articles.

20 The first is entitled The Cell as a Collection of
21 Protein Machines, Preparing the Next Generation of
22 Molecular Biologists. The next article is Polymerases
23 and the Replisome, Machines within Machines. Eukaryotic
24 Transcription, An Interlaced Network of Transcription
25 Factors and Chromatin-Modifying Machines. Mechanical

1 Devices of the Spliceosome, Motors, Clocks, Springs, and
2 Things. And several other articles along the same vein.

3 So the point is that, the cell is full of
4 machines and that they are treated as such by
5 scientists.

6 Q. Now this journal that you're referring to, Cell,
7 that's a fairly prominent scientific journal?

8 A. Yes, it is a prestigious journal.

9 Q. I believe we have another slide to demonstrate
10 this point?

11 A. Yes. On the next slide, it shows the bottom of
12 the second page of the table of contents. That, I just
13 inserted a little picture of the cover there. It didn't
14 actually occur in the original page. But down at the
15 bottom of that page, they have a little blurb describing
16 this special issue of the journal Cell.

17 If you look at the next slide, that blurb is
18 blown up for easier reading. And let me quote from it.
19 It says, quote, Like the machines invented by humans to
20 deal efficiently with the macroscopic world, protein
21 assemblies contain highly coordinated moving parts.
22 Reviewed in this issue of Cell are the protein machines
23 that control replication, transcription, splicing,
24 nucleocytoplasmic transport, protein synthesis, protein
25 assembly, protein degradation, and protein

1 translocation. The machines that underlie the workings
2 of all living things. So again, this special issue
3 recognizes that these are machines and that the cell is
4 run by machines.

5 Q. So again, if I direct your attention to the
6 exhibit book, Tab 6 in particular, Defendants' Exhibit
7 203-C, as in Charlie, is that the cover of the Cell, the
8 table of contents and that section that you just
9 referred to in your testimony?

10 A. Yes, it is.

11 Q. Did any scientist explain why these are indeed
12 machines?

13 A. Yes. In the initial article in this special
14 review issue, which is shown on the next slide, the
15 initial article was written by a man named Bruce
16 Alberts, who was, until a couple months ago, the
17 president of the National Academy of Sciences. He wrote
18 the initial article called The Cell as a Collection of
19 Protein Machines, Preparing the Next Generation of
20 Molecular Biologists.

21 And in his article, he wrote, quote, Why do we
22 call the large protein assemblies that underlie cell
23 function protein machines? Precisely because, like the
24 machines invented by humans, these protein assemblies
25 contain highly coordinated moving parts.

1 So he was emphasizing that this is why we call
2 them machines. They act like machines. They contain
3 highly coordinated moving parts. They transduce energy
4 just like the machines of our experience.

5 Q. So they're machines and not metaphors?

6 A. That's exactly right.

7 Q. Up top here in that title of that article, it
8 says, preparing the next generation of molecular
9 biologists. Does Dr. Alberts make any suggestions in
10 this article?

11 A. Yes, in the article, he makes the suggestion that
12 upcoming generations of molecular biologists should be
13 trained in engineering principles so that they can
14 better understand the operation of the cell.

15 Q. Do sciences recognize evidence of design in
16 nature?

17 A. Yes, they do.

18 Q. And do you have some examples to demonstrate that
19 point?

20 A. Yes, I do. On the next slide is the cover of a
21 book written by a man named Richard Dawkins, who is a
22 professor of biology at Oxford University and a very
23 strong proponent of Darwinian evolution. In 1986, he
24 wrote a book entitled *The Blind Watchmaker*, why the
25 evidence of evolution reveals a universe without design.

1 Nonetheless, even though he is, in fact, a strong
2 Darwinist, on the first page of the first chapter of his
3 book, he writes the following.

4 Quote, Biology is the study of complicated things
5 that give the appearance of having been designed for a
6 purpose, close quote. So let me just emphasize that
7 here's Richard Dawkins saying, this is the very
8 definition of biology, the study of complicated things
9 that give the appearance of having been designed for a
10 purpose.

11 Q. Does he explain why they appear design, how it is
12 that we can detect design?

13 A. Yes, he does. And that is shown on the next
14 slide. It is not because of some emotional reaction.
15 It is not due to some fuzzy thinking. It's due to the
16 application of an engineering point of view. He writes
17 on page 21 of the first chapter, quote, We may say that
18 a living body or organ is well designed if it has
19 attributes that an intelligent and knowledgeable
20 engineer might have built into it in order to achieve
21 some sensible purpose, such as flying, swimming, seeing.
22 Any engineer can recognize an object that has been
23 designed, even poorly designed, for a purpose, and he
24 can usually work out what that purpose is just by
25 looking at the structure of the object, close quote.

1 So let me just emphasize that he, in other words,
2 is stating that we recognize design by the purposeful
3 arrangement of parts. When we see parts arranged to
4 achieve some sensible purpose, such as flying, swimming,
5 and seeing, we perceive design.

6 Q. Now is it fair to say that he's looking at, and
7 intelligent design proponents look at physical
8 structures similar to like the paleontologist does and
9 then drawing reasonable inferences from those physical
10 structures?

11 A. That's exactly right. What intelligent design
12 does is look at the physical, observable features and
13 use logic to infer deductions from that.

14 Q. Now you, as well as Dawkins in the slides that
15 we've just been looking at, refer to purpose. Now when
16 you use -- when you were using purpose, are you making a
17 philosophical claim by using that term?

18 A. No. The word purpose, like many other words, can
19 have different meanings. And the purpose here used by
20 Professor Dawkins and in intelligent design does not
21 refer to some fuzzy purpose of life or some such thing
22 as that. It's purpose in the sense of function.

23 And I think on the next slide, I emphasize that
24 Dawkins is using some sensible purpose, such as flying,
25 swimming, seeing. An engineer can work out the purpose

1 of an object by looking at its structure. He's talking
2 about purpose in the sense of function.

3 Q. Now this appearance of design, is this a faint
4 appearance?

5 A. No, indeed. This is not just some marginal vague
6 impression. Richard Dawkins, a strong proponent of
7 Darwinian evolution, insists, he says, quote, Yet the
8 living results of natural selection overwhelmingly
9 impress us with the appearance of design, as if by a
10 master watchmaker, impress us with the illusion of
11 design and planning, close quote.

12 Let me make two points with this. He thinks that
13 this is an illusion because he thinks he has an
14 alternative explanation for what he sees. Nonetheless,
15 what he sees directly gives him the overwhelming
16 impression of design.

17 Q. Have other scientists made similar claims
18 regarding the evidence of design in nature?

19 A. Yes. On the next slide is a quotation from a
20 book written by a man named Francis Crick. Francis
21 Crick, of course, is the Nobel laureate with James
22 Watson who won the Nobel Prize for their discovery of
23 the double helicle structure of DNA.

24 In a book published in 1998, he wrote, quote,
25 Biologists must constantly keep in mind that what they

1 see was not designed, but rather evolved. So
2 apparently, in the view of Francis Crick, biologists
3 have to make a constant effort to think that things that
4 they studied evolved and were not designed.

5 Q. I want to return to Richard Dawkins here for a
6 moment and The Blind Watchmaker. Did he borrow his
7 title from somewhere?

8 A. Yes, the watchmaker of his title has an illusion
9 which he explained on page 4 of his book. He says,
10 quote, The watchmaker of my title is borrowed from a
11 famous treatise by the 18th century theologian William
12 Paley. And he starts to quote William Paley. So he is
13 using his book as an answer to, or an argument to,
14 William Paley's discussions of these issues. And he
15 treats William Paley with the utmost respect.

16 Q. I believe we have a slide to highlight that.

17 A. Yes, here's a quotation from William Paley.
18 Paley is best known for what is called his watchmaker
19 argument. And that is briefly this. He says that, when
20 we walk -- if we were walking across a field, and we hit
21 our foot against a stone, well, we wouldn't think much
22 of it. We would think that the stone might have been
23 there forever.

24 But if we stumble across a watch and we pick it
25 up, then Paley goes on to say, when we come to inspect

1 the watch, we perceive that its several parts are framed
2 and put together for a purpose; for example, that they
3 so formed and adjusted as to produce motion, and that
4 motion so regulated as to point out the hour of the day.
5 Let me close quote here, and say that, he is talking
6 about the purposeful arrangement of parts.

7 Let me continue with a quotation from William
8 Paley. Quote, he says, The inference we think is
9 inevitable, that the watch must have had a maker, close
10 quote. So he is inferring from the physical structure
11 of the watch to an intelligent designer.

12 Q. Is that a theological argument?

13 A. No, this is a scientific argument based on
14 physical facts and logic. He's saying nothing here
15 about any religious precept, any theological notion.
16 This is a scientific argument.

17 Q. Does Richard Dawkins himself recognize it as an
18 argument based on logic?

19 A. Yes, he does, and he goes to great lengths to
20 address it in his book, The Blind Watchmaker.

21 Q. What sort of reasoning or argument is this that
22 we're talking about, this scientific argument that
23 you're referring to?

24 A. This is an instance of what is called inductive
25 reasoning when we --

1 Q. I'm sorry. We have a slide here to demonstrate
2 this point?

3 A. Yes, thank you. Just to help illustrate this
4 point, I just grabbed an article from the Encyclopedia
5 Britannica online entitled Inductive Reasoning. And the
6 Encyclopedia Britannica says, quote, When a person uses
7 a number of established facts to draw a general
8 conclusion, he uses inductive reasoning. This is the
9 kind of logic normally used in the sciences.

10 Let me skip the middle of the quotation and say,
11 It is by this process of induction and falsification
12 that progress is made in the sciences. So this William
13 Paley's argument, the kind of argument that, say,
14 Professor Padian made about bird feathers and so on are
15 all examples of inductive reasoning, and they are all
16 examples of scientific reasoning.

17 Q. This is the sort of reasoning that is employed in
18 science quite readily?

19 A. Yes. As the article makes clear, this is the
20 normal mode of thinking in science.

21 Q. Is that the sort of reasoning you employ to
22 conclude design, for example, in your book Darwin's
23 Black Box?

24 A. Yes, this is exactly the kind of reasoning that I
25 used in Darwin's Black Box. On this slide here, which

1 includes an excerpt from Chapter 9 entitled Intelligent
2 Design, I say the following.

3 Quote, Our ability to be confident of the design
4 of the cilium or intracellular transport rests on the
5 same principles as our ability to be confident of the
6 design of anything, the ordering of separate components
7 to achieve an identifiable function that depends sharply
8 on the components, close quote. In other words, the
9 purposeful arrangement of parts.

10 Q. Did you provide specific examples of that in your
11 book?

12 A. Yes, I did. In that Chapter 9, if you continue,
13 I applied that same reasoning to the biochemical
14 examples that I had discussed in earlier chapters. Let
15 me quote a couple of passages here. Quote, The function
16 of the cilium is to be a motorized paddle. In order to
17 achieve the function microtubules, nexin linkers, and
18 motor proteins all have to be ordered in a precise
19 fashion, close quote.

20 Next quote. The function of the blood clotting
21 system is as a strong-but-transient barrier. The
22 components of the system are ordered to that end. They
23 act to form an elegant structure that accomplishes a
24 specific task, close quote.

25 Next quotation. Quote, The functions of the

1 other biochemical systems we have discussed are readily
2 identifiable and their interacting parts can be
3 enumerated. Because the functions depend critically on
4 the intricate interactions of the parts, we must
5 conclude that they were designed, close quote. So
6 again, the reasoning is exactly the same. It is the
7 purposeful arrangement of parts.

8 Q. Again, I would ask you to, if we could return to
9 the summary of the argument for intelligent design.

10 A. Yes. Thank you. Here again is the slide that we
11 looked at earlier summarizing the argument for
12 intelligent design, and perhaps, in retrospect, more of
13 it will be understandable.

14 The first part is that we infer design when we
15 see that parts appear to be arranged for a purpose. Not
16 only I do that, not only did William Paley do that, but
17 Richard Dawkins and David DeRosier do the same thing.
18 The strength of the inference is quantitative. The more
19 parts that are arranged, and the more intricately they
20 interact, the stronger is our confidence in design.

21 The third part is, the appearance of design in
22 aspects of biology is overwhelming, as everybody,
23 including Richard Dawkins, admits. And the final point
24 is that, since nothing other than an intelligent cause
25 has been demonstrated to be able to yield such a strong

1 appearance of design, Darwinian claims, notwithstanding,
2 the conclusion that the design seen in life is real
3 design is rationally justified.

4 If I could just take a moment to point out
5 something. This argument for design is an entirely
6 positive argument. This is how we recognize design by
7 the purposeful arrangement of parts.

8 Q. Now Plaintiffs' experts, including Dr. Miller,
9 testified that they have yet to see a positive argument
10 for design advanced by intelligent design proponents. I
11 believe we have a slide from his actual testimony here.

12 A. Yes, that's a photocopy of his testimony. And on
13 the next is a transcription of a portion of that
14 testimony. And he was asked about the argument, and he
15 said that the design argument is in every respect a
16 completely negative argument. If one combs the pages of
17 Pandas and People, or for that matter, if one looks at
18 Dr. Behe's book, or if one looks at the writings of
19 other people who -- that one can't find such an
20 argument.

21 And he goes on to say, quote, I have yet to see
22 any explanation advanced by any adherent of design that
23 basically says, we have found positive evidence for
24 design. The evidence is always negative, and it
25 basically says, if evolution is incorrect, the answer

1 must be design, close quote.

2 Q. How do you respond to that criticism?

3 A. Well, in two ways. First of all, let me just say
4 that, of course, I think it's a mischaracterization.
5 But on the second, it's kind of understandable, because
6 Professor Miller is looking at the evidence through his
7 own theoretical perspective and can only see things that
8 seem to fit with his own theoretical perspective.

9 So this, I think, shows the importance of being
10 able to look at data from different points of view so
11 that one can see, can see it from different
12 perspectives. But additionally on the next slide, in
13 order to help him see, I would direct him to read more
14 closely Chapter 9 of Darwin's Black Box, the chapter
15 entitled Intelligent Design, where I explain exactly how
16 one perceives design and explains why the biochemical
17 systems that I discussed earlier in the book are good
18 examples of design.

19 I would further direct him to go and look at the
20 structures of the machinery found in the cell without
21 Darwinian spectacles on and see the very, very strong
22 appearance of design, which everybody admits to, David
23 DeRosier, Richard Dawkins, and so on, which is easily
24 perceived even by a lay people in the figure of the
25 flagellum, and also to read such material in the

1 professional scientific literature, as I refer to in the
2 journal Cell, the special issue on molecular machines.

3 Q. Dr. Behe, is intelligent design science?

4 A. Yes, it certainly is.

5 Q. And why is that?

6 A. Because it relies completely on the physical,
7 observable, empirical facts about nature plus logical
8 inferences.

9 Q. And that again is a scientific method?

10 A. That is the way science proceeds.

11 Q. I want to ask you if you agree with this
12 testimony provided by Dr. Miller. He testified that it
13 is a standard scientific practice for scientists to
14 point to the scientific literature, to point to
15 observations and experiments that have been done by
16 other people in other laboratories, have been peer
17 reviewed, have been published, and to cite to that
18 evidence, cite to those data, and to cite to those
19 experiments in their arguments. Do you agree with that?

20 A. Yes, I agree completely.

21 Q. Is that what you have done, and intelligent
22 design has done in presenting its arguments?

23 A. That's what I have done. That's what the
24 scientists that wrote those books I showed earlier have
25 done. That's have a very common practice in science.

1 Q. Did Crick and Watson employ the same procedure?

2 A. Yes, that's correct. Francis Crick and James
3 Watson, whose names I have mentioned earlier, who won
4 the Nobel Prize for determining the double helicle
5 structure of DNA, actually did not do the experimental
6 work upon which their conclusions were based.

7 The experimental work, which consisted of doing
8 x-ray fiber defraction studies on DNA, was actually done
9 by a woman named Rosalyn Franklin, and they used her
10 data to reach their conclusions.

11 Q. I want to ask you if you also agree with Dr.
12 Miller that the question is not whether you or any other
13 scientist has done experiments in your own laboratories
14 that have produced evidence for a particular claim, the
15 question is whether or not the inferences that you and
16 the scientists draw on your analysis from that data are
17 supported?

18 A. Yes, I agree completely. Again, those books that
19 I showed in the beginning, that is exactly what those
20 scientists did. They looked very widely for all
21 relevant scientific information that would bear on the
22 argument that they were making.

23 Q. Again, is that what Crick and Watson employed?

24 A. Yes, that's what Crick and Watson did, too.
25 Scientists do it all the time.

1 Q. Is that what you're doing in support of your
2 claim for intelligent design?

3 A. Yes, that's exactly right.

4 Q. And have you argued that intelligent design is
5 science in your writings?

6 A. Yes, I have.

7 Q. Is intelligent design falsifiable?

8 A. Yes, it is.

9 Q. And I want to get to that in a little bit more
10 detail later. Now just to summarize. When you say you
11 are relying on logical inferences, you're referring to
12 inductive reasoning, correct?

13 A. Yes, inductive reasoning.

14 Q. And other than intelligent design, as you
15 discussed, and you discussed a little bit about
16 paleontology, do you have an example of this sort of
17 reasoning, inductive reasoning that's used in sciences?

18 A. Well, I think an excellent example of inductive
19 reasoning is the Big Bang theory. Most people forget
20 that in the early part of the 20th century that
21 physicists thought the universe was timeless, eternal,
22 and unchanging.

23 Then in the late 1920's, observations were made
24 which led astronomers to think that galaxies that they
25 could observe were rushing away from each other and

1 rushing away from the Earth as if in the aftermath of
2 some giant explosion.

3 So they were using inductive reasoning of their
4 experience of explosions to, and applying that to their
5 astronomical observations. And let me emphasize that
6 they were -- the inductive method, as philosophers will
7 tell you, always extrapolates from what a we know to
8 instances of what we don't know.

9 So those scientists studying the Big Bang were
10 extrapolating from their knowledge of explosions as seen
11 in, say, fire crackers, cannon balls, and so on, and
12 extrapolating that to the explosion of the entire
13 universe, which is quite a distance from the basis set
14 from which they drew their induction.

15 But nonetheless, they were confident that this
16 pattern suggested an explosion based on their experience
17 with more familiar objects.

18 Q. And basically, we don't have any experience with
19 universes exploding, correct?

20 A. I do not, no.

21 Q. And scientists do not?

22 A. No, scientists don't either.

23 Q. Again, is this similar to the reasoning used in
24 paleontology? For example we haven't seen any live
25 pre-historic birds, for example, but they have features

1 that resemble feathers, as we know them from our common
2 experience today, and we infer that they were used for
3 flying or similar functions, again based on our common
4 experience?

5 A. Yes, that's right. That's another example of
6 induction from what we know to things we don't know.

7 Q. Again, that's scientific reasoning?

8 A. Yes, it is.

9 Q. Can science presently tell us what caused the
10 Bang?

11 A. No. I'm not a physicist, but I understand the
12 cause of the Big Bang is still unknown.

13 Q. Is that similar to intelligent design's claim
14 that science presently cannot tell us the source of
15 design in nature?

16 A. Yes, that's very similar. All theories, when
17 they're proposed, have outstanding questions, and
18 intelligent design is no exception. And I'd like to
19 make a further point that I just thought of and was
20 going to make earlier, but that, that induction from
21 explosions of our experience to explosions of the
22 universe is analogous to, similar to the induction that
23 intelligent design makes from our knowledge of objects,
24 the purposeful arrangements of parts in our familiar
25 world and extrapolating that to the cell as well. So

1 that, too, is an example of an induction from what we
2 know to what we have newly discovered.

3 Q. Now was the Big Bang theory controversial when it
4 was first proposed?

5 A. Yes, it turns out that the Big Bang theory was,
6 in fact, controversial because -- not because of the
7 scientific data so much, but because many people,
8 including many scientists, thought that it had
9 philosophical and even theological implications that
10 they did not like.

11 And on the next slide, I have a quotation of a
12 man named Arthur Eddington, which is quoted in a book by
13 a philosopher of science, Susan Stebbing. Arthur
14 Eddington wrote, quote, Philosophically, the notion of
15 an abrupt beginning to the present order of nature is
16 repugnant to me, as I think it must be to most. And
17 even those who would welcome a proof of the intervention
18 of a creator will probably consider that a single
19 winding up at some remote epoch is not really the kind
20 of relation between God and his world that brings
21 satisfaction to the mind, close quote.

22 Let me say a couple things. I don't think I
23 mentioned that Arthur Eddington was a very prominent
24 astronomer of that age. The second point is that,
25 notice that the reason that he does not like this

1 theory, this scientific proposal, is not because of
2 scientific reasons, but because of philosophical and
3 theological reasons.

4 But nonetheless, that does not affect the status
5 of the Big Bang proposal, which was based completely on
6 physical, observable evidence plus logical inferences.
7 And because of that, it was strictly a scientific
8 theory, even though Arthur Eddington saw other
9 ramifications that he did not like.

10 Q. I believe you have another quote to demonstrate
11 that point?

12 A. Yes. Here's a passage from a book by a man named
13 Karl von Weizsacker. Karl von Weizsacker was again an
14 astronomer in the middle part of the 20th century, and
15 he wrote a book in 1964 entitled The Relevance of
16 Science where he recalled his interactions with other
17 scientists when the Big Bang theory was being proposed.

18 Let me quote from that passage. Quote, He, and
19 he's referring to Walter Nernst, who was a very
20 prominent chemist of that time, said, the view that
21 there might be an age of the universe was not science.
22 At first, I did not understand him. He explained that
23 the infinite duration of time was a basic element of all
24 scientific thought, and to deny this would mean to
25 betray the very foundations of science.

1 I was quite surprised by this, and I ventured the
2 objection that it was scientific to form hypothesis
3 according to the hints given by experience, and that the
4 idea of an age of the universe was such a hypothesis.
5 He retorted that we could not form a scientific
6 hypothesis which contradicted the very foundations of
7 science.

8 He was just angry, and thus the discussion, which
9 was continued in his private library, could not lead to
10 any result. What impressed me about Nernst was not his
11 arguments. What impressed me was his anger. Why was he
12 angry? Close quote.

13 Let me make a couple comments on this passage.
14 This is an example of when people are arguing about what
15 science is. To Walter Nernst, the very idea that there
16 could be a beginning to the universe was unscientific,
17 and we could not entertain that.

18 On the other hand, von Weizsacker said that
19 science has to take its hints from what evidence is
20 available. We have to form hypotheses according to the
21 hints given by experience. And to me, this is very
22 similar to what I see going on in the debate over
23 intelligent design today.

24 Many people object that this can't be science,
25 this violates the very definition of science, whereas

1 other people, myself including, say that we have to form
2 hypotheses according to the hints given by experience.

3 Q. Does the Big Bang continue to be controversial in
4 more modern times?

5 A. Yes. Surprisingly, it's still controversial and
6 still mostly because of its extra scientific
7 implications. For example, here is an image of an
8 editorial which appeared in the journal Nature in the
9 year 1989 with the surprising title Down with the Big
10 Bang. And if you advance to the next slide, we can see
11 it more easily.

12 The subtitle of the article, where it is written,
13 quote, Apart from being philosophically unacceptable,
14 the Big Bang is an over-simple view of how the universe
15 began. So let me point out that this was written by a
16 man named John Maddox. John Maddox was the editor of
17 Nature, the most prestigious science journal in the
18 world.

19 For 20 years, he was the editor, and he wrote an
20 editorial entitled Down with the Big Bang, at least
21 partly because he viewed the idea of the Big Bang as
22 philosophically unacceptable.

23 Q. Do you have another quote from this?

24 A. Yes, I do. Actually in the text of the Maddox
25 article, he goes on to explain in further detail some of

1 his objections to the Big Bang. And he says the
2 following. Quote, Creationists and those of similar
3 persuasion seeking support for their opinions have ample
4 justification in the doctrine of the Big Bang. That,
5 they might say, is when and how the universe was
6 created, close quote.

7 Let me make a couple of points here. Again, he
8 does not like this theory apparently because of its
9 extra scientific implications, because he sees
10 theological implications in the theory. He says that
11 creationists have ample justification, and he objects to
12 that justification.

13 Let me make another point. He's using the word
14 creationist here in a very broad sense to mean anybody
15 who thinks that the very beginning of the universe might
16 have been a -- an extra -- a supernatural act, that the
17 laws of the universe might have been made, have been set
18 from somewhere beyond nature.

19 And he uses the word creationist in a very
20 pejorative sense to incite the disapprobation of the
21 readers against people who would hold this view.

22 Q. Do the implications that Maddox refers to here,
23 does this make the Big Bang theory creationism?

24 A. No, it certainly does not. One has to be very
25 careful in looking at scientific ideas, because many

1 scientific ideas do have interesting philosophical or
2 other ramifications, and the Big Bang is one of those.
3 Nonetheless, the Big Bang is an entirely scientific
4 proposal, because again, it is based simply on the
5 observable, empirical, physical evidence that we find in
6 nature plus logical inferences.

7 Q. Do you see similarity between the Big Bang theory
8 and intelligent design?

9 A. Yes, I do. I see a number of similarities.
10 First, some people have seen controversial philosophical
11 and perhaps even theological implications of those two
12 proposals. But in both cases, they are based entirely
13 on the physical, empirical evidence of nature plus
14 logical inferences.

15 Q. Is it true that the Big Bang bracket can be a
16 question of cause?

17 A. Yes, that's a good point to consider. The Big
18 Bang hypothesis struck many people, such as John Maddox
19 and Arthur Eddington and so on, as perhaps having pretty
20 strong, even theological implications. Maybe this was a
21 creation event.

22 But nonetheless, physicists were able to work
23 within the Big Bang model that the question of what
24 caused the Big Bang was just left as an open question
25 and work proceeded on other issues within the Big Bang.

1 Q. Do you see any similarity in that regard with
2 intelligent design?

3 A. Yes, I do. The design in life can be readily
4 apprehended by the purposeful -- by the purposeful
5 arrangement of parts. However, identifying a designer
6 or identifying how the design was accomplished, they are
7 different questions which might be much more difficult
8 and much harder to address. Questions such as that can
9 be left aside and other sorts of questions could be
10 asked.

11 Q. Does this make intelligent design a, quote,
12 unquote, science stopper, as we heard in this case?

13 A. No more than it makes the Big Bang a science
14 stopper. The Big Bang posits a beginning to nature
15 which some people thought was the very antithesis of
16 science. It presented a question, the cause of the Big
17 Bang, which could not be answered, and which has not
18 been answered to this very day, and nonetheless, I think
19 most people would agree that a large amount of science
20 has been done within the Big Bang model.

21 Q. So after the Big Bang theory was proposed, we
22 didn't shut down all our science departments and close
23 up all the laboratories and just stop scientific
24 exploration?

25 A. Not to my knowledge.

1 Q. I believe you have a quote from one of your
2 articles making the point regarding the scientific
3 nature of intelligent design, is that correct?

4 A. Yes, that's right. I think it's on the next
5 slide in the article Reply to my Critics, which I
6 published in the journal Biology and Philosophy, I
7 pointed this out explicitly. Let me just go to the
8 underlined part, the bold part. Quote, I wrote, The
9 conclusion of intelligent design in biochemistry rests
10 exclusively on empirical evidence, the structures and
11 functions of the biochemical systems, plus principles of
12 logic. Therefore, I consider design to be a scientific
13 explanation, close quote.

14 Q. Now another complaint that we've heard in the
15 course of this trial is that intelligent design is not
16 falsifiable. Do you agree with that claim?

17 A. No, I disagree. And I think I further in slides
18 from my article in Biology and Philosophy in which I
19 wrote on that. If you get to the next slide -- oh, I'm
20 sorry. Thank you. You got that. In this, I address
21 it. I'm actually going to read this long quotation, so
22 let me begin.

23 Quote, In fact, intelligent design is open to
24 direct experimental rebuttal. Here is a thought
25 experiment that makes the point clear. In Darwin's

1 Black Box, I claimed that the bacterial flagellum was
2 irreducibly complex and so required deliberate
3 intelligent design. The flip side of this claim is that
4 the flagellum can't be produced by natural selection
5 acting on random mutation, or any other unintelligent
6 process.

7 To falsify such a claim, a scientist could go
8 into the laboratory, place a bacterial species lacking a
9 flagellum under some selective pressure, for mobility,
10 say, grow it for 10,000 generations, and see if a
11 flagellum, or any equally complex system, was produced.
12 If that happened, my claims would be neatly disproven.
13 Close quote.

14 So let me summarize that slide. It says that if,
15 in fact, by experiment, by growing something or seeing
16 that in some organism such as a bacterium grown under
17 laboratory conditions, grown for and examined before and
18 afterwards, if it were seen that random mutation and
19 natural selection could indeed produce the purposeful
20 arrangement of parts of sufficient complexity to mimic
21 things that we find in the cell, then, in fact, my claim
22 that intelligent design was necessary to explain such
23 things would be neatly falsified.

24 Q. I got a couple questions about the proposal that
25 you make. First of all, when you say you place

1 something under selective pressure, what does that mean?

2 A. Well, that means you grow it under conditions
3 where, if a mutation -- a mutant bacterium came along
4 which could more easily grow under those conditions,
5 then it would likely propagate faster than other cells
6 that did not have that mutation.

7 So, for example, if you grew a flask of bacteria
8 and let them sit in a beaker that was motionless, and
9 the bacteria did not have a flagellum to help it swim
10 around and find food, they could only eat then the
11 materials that were in their immediate vicinity.

12 But if some bacterium, some mutant bacterium were
13 produced that could move somewhat, then it could gather
14 more food, reproduce more, and be favored by selection.

15 Q. Is that a standard technique that's used in
16 laboratories across the country?

17 A. Yes, such experiments are done frequently.

18 Q. And I just want to ask you a question about this
19 grow it for 10,000 generations. Does that mean we have
20 to wait 10,000 years of some sort to prove this or
21 disprove this?

22 A. No, not in the case of bacteria. It turns out
23 that the generation time for bacteria is very short. A
24 bacterium can reproduce in 20 minutes. So 10,000
25 generations is actually, I think, just a couple years.

1 So it's quite doable.

2 Q. Have scientists, in fact, grown bacteria out to
3 10,000 generations?

4 A. Yes, there are experiments going on where
5 bacteria have been grown for 40,000 generations. So
6 again, this is something that can be done.

7 Q. So this is a readily doable experiment?

8 A. That's correct.

9 Q. Sir, do you believe that natural selection is
10 similarly falsifiable?

11 A. No. Actually, I think that, in fact, natural
12 selection and Darwinian claims are actually very, very
13 difficult to falsify. And let me go back to my article,
14 Reply to my Critics from the journal Biology and
15 Philosophy.

16 And I don't think I'm actually going to read this
17 whole thing, because it refers to things that would take
18 a while to explain. But let me just try to give you the
19 gist of it. Let me read the first sentence. Quote,
20 Let's turn the tables and ask, how could one falsify a
21 claim that a particular biochemical system was produced
22 by Darwinian processes? Close quote.

23 Now let me just kind of try to explain that in my
24 own -- well, verbally here. Suppose that we did that
25 same experiment as I talked about earlier. Suppose a

1 scientist went into a laboratory, grew a bacterium that
2 was missing a flagellum under selective pressure for
3 motion, waited 10,000, 20,000, 30,000, 40,000
4 generations, and at the end of that time, examined it
5 and saw that, well, nothing much had been changed,
6 nothing much had changed.

7 Would that result cause Darwinian biologists to
8 think that their theory could not explain the flagellum?
9 I don't think so. I think they would say, number 1,
10 that we didn't wait long enough; number two, perhaps we
11 started with the wrong bacterial species; number 3,
12 maybe we applied the wrong selective pressure, or some
13 other problem.

14 Now leaving aside the question of whether those
15 are reasonable responses or not, and some of them might
16 be reasonable, nonetheless, the point is that, it's very
17 difficult to falsify Darwinian claims. What experiment
18 could be done which would show that Darwinian processes
19 could not produce the flagellum?

20 And I can think of no such experiment. And as a
21 matter of fact, on the next slide, I have a quotation,
22 kind of putting a point on that argument. In that same
23 article, Reply to my Critics, I wrote that I think
24 Professor Coyne and the National Academy of Sciences
25 have it exactly backwards. And Professor Jerry Coyne is

1 an evolutionary biologist who said that intelligent
2 design is unfalsifiable, and in a publication of the
3 National Academy, they asserted the same thing.

4 I wrote that, A strong point of intelligent
5 design is its vulnerability to falsification. A weak
6 point of Darwinian theory is its resistance to
7 falsification. What experimental evidence could
8 possibly be found that would falsify the contention that
9 complex molecular machines evolved by a Darwinian
10 mechanism? I can think of none, close quote.

11 So again, the point is that, I think the
12 situation is exactly opposite of what much -- of what
13 many arguments assume, that ironically intelligent
14 design is open to falsification, but Darwinian claims
15 are much more resistant to falsification.

16 MR. MUISE: Your Honor, if I may say, I know
17 we took kind of a later break, but I'm about to enter
18 into another area. The noon hour is almost --

19 THE COURT: How about we go to about 12:15?
20 Does that work for you?

21 MR. MUISE: That may end up causing me to
22 stop in the middle of a line of questioning, that's why
23 I'm just raising it now.

24 THE COURT: You would be better off now?

25 MR. MUISE: I would prefer it now.

1 THE COURT: Let's do that then. We'll take
2 our lunch break at this point. Why don't we return at
3 about 1:20. After our lunch break, we'll pick up with
4 our next topic by Mr. Muise at that time. We'll be in
5 recess until 1:20.

6 (Whereupon a lunch recess was taken at
7 12:00 noon.)

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CERTIFICATION

I hereby certify that the proceedings and evidence are contained fully and accurately in the notes taken by me on the within proceedings, and that this copy is a correct transcript of the same.

/s/ Wendy C. Yinger

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