IN THE UNITED STATES DISTRICT COURT

FOR THE MIDDLE DISTRICT OF PENNSYLVANIA

TAMMY KITZMILLER; BRYAN AND CHRISTY REHM; DEBORAH FENIMORE AND JOEL LIEB; STEVEN STOUGH; BETH EVELAND; CYNTHIA SNEATH; JULIE SMITH; AND ARALENE ("BARRIE") D. AND FREDERICK B. CALLAHAN,

Plaintiffs,

v. Civil Action No.: 04-CV-2688 (M.D. Pa.)

DOVER AREA SCHOOL DISTRICT; DOVER AREA SCHOOL DISTRICT BOARD OF DIRECTORS,

Defendants.
_____/

DEPONENT: STEVE WILLIAM FULLER, PH.D.

DATE: Tuesday, June 21, 2005

TIME: 9:35 a.m.

LOCATION: 24 Frank Lloyd Wright Drive

Ann Arbor, Michigan

APPEARANCES:

For the Plaintiffs:

MR. ERIC ROTHSCHILD
Pepper Hamilton, LLP
3000 Two Logan Square, 18th and Arch Streets
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(215) 981-4000

For the Defendants:

MR. PATRICK T. GILLEN (P47456)
Thomas More Law Center
3475 Plymouth Road, Suite 100
Ann Arbor, Michigan 48105
(734) 827-2001

REPORTED BY: Robert Edward Bouck, CSR-3530
Certified Shorthand Reporter

I N D E X

WITNESS:

EXHIBITS:

Ann Arbor, Michigan
June 21, 2005
At or about 9:35 a.m.

* * *

S T E V E W I L L I A M F U L L E R, PH.D.,
having first been duly sworn or affirmed by the Notary Public,
was examined and testified as follows:

EXAMINATION

BY MR. ROTHSCHILD:

Q Good morning, Dr. Fuller.

A Good morning.

Q I've introduced myself off the record, but let me do it on the record. My name is Eric Rothschild. I'm from the law firm of Pepper Hamilton, LLP, and I represent the plaintiffs in the lawsuit captioned Kitzmiller, et al., versus Dover Area School District and the Dover school board. And your deposition is being taken in that matter. Do you understand that?

A Yes, I do.

Q Okay. How would you like me to address you in this proceeding?

A Is there a standard format?

MR. GILLEN: Whatever you're comfortable with.

THE WITNESS: You can call me Steve.

BY MR. ROTHSCHILD, CONTINUING:

Q You can call me Eric.
A All right.
Q I understand from your expert report that you've never been an expert witness at a trial before; is that correct?
A That is correct.
Q Have you ever been retained as an expert witness in any capacity prior to this, an expert witness in litigation prior to this proceeding?
A No. I have talked to lawyers, but apparently these cases didn't go to trial. And so nothing ever happened.
Q But were you actually retained in a --
A No, no.
Q Have you ever testified at a trial --
A No.
Q -- under any other circumstances?
A No, I have not.
Q Okay. Have you ever testifed at a deposition before?
A No, I have not.
Q I'm just going to tell you a little bit about the process. I'm sure Pat's explained some of it to you, but let me do it on the record. I'm going to be asking you questions, and you'll answer my questions. And Bob here will take those -- that colloquy down so he can make a written transcript. One of the things which we have to do which I often violate -- and you already have -- is allowing each other to finish --

A Oh, right. Oh, sorry.
Q Obviously, in ordinary conversation, we have the habit of interrupting each other all the time, particularly when we think we know where the conversation is going. But that's going to make things very difficult for Bob, and we won't have a very clear record. So please, let me finish my questions before you respond. I will endeavor to do the same for you. And if at any time I've cut off your answer, please let me know, okay? Another thing that we have to keep in mind is because we're trying to create a written record, we have to answer in -- you have to answer in words, so that --
A Yes. No nodding.
Q So your response will be clear. This is not an endurance test. At any time if you need to take a break just to clear your head, use the facilities, talk to Mr. Gillen, please let me know and I'm happy to do that. I may initiate some breaks myself, okay?
A Yes.
Q Am I -- do I understand correctly that you are represented by counsel at this deposition?
A Yes?
MR. GILLEN: Yeah.
THE WITNESS: Yes.
BY MR. ROTHSCHILD, CONTINUING:
Q And that's Mr. Gillen?

A Yes.
Q Okay. Did you meet with Mr. Gillen to prepare for this deposition?
A Yes.
Q And when did you do that?
A Well, in person, last night and this morning.
Q Okay. For how many hours did you meet with him?
A Oh, maybe three. Three maybe.
Q Did you look at any documents to prepare for the deposition?
A I did look at the expert reports on the other side. I believe I've looked at six of those.
Q And did you do that in order to prepare for your deposition?
A I did that to write the rebuttal statement.
Q Okay. Did you ever read any of the expert reports, other expert reports for defendants, your side of the case?
A I was given a copy of Stephen Meyer's, which I received maybe a week ago.
Q Okay.
A I haven't seen any of the others.
Q Okay. Did you read Mr. Meyer's -- Dr. Meyer's --
A Yes, yes.
Q -- report?
A Yes, I have.
Q And please let me try and finish my --
A I'm sorry.

Q -- question. Are you being paid as an expert witness?
A Yes.
Q Okay. And that's in the rate of $100 per hour?
A Yes.
Q Who is paying that compensation?
A I guess you are.
Q Okay. And when you say you, the Thomas More Law Center?
A Yes.
Q When were you retained to be an expert?
A Can I consult with him on this?
Q Why don't you give me your memory and --

MR. GILLEN: Yeah.

THE WITNESS: Oh, okay. Well, I believe I was first contacted maybe toward the end of February. And then certainly within a few weeks, I was already on-board. We spoke on the phone a couple of times at great length about this.

BY MR. ROTHSCHILD, CONTINUING:
Q Okay. When you were first contacted in February, what were you asked to do?
A I was asked -- I was just told about the case which I had already heard of because it was widely reported in the British press. And he was sort of scoping out what his position was going to be and whether I would have anything to offer to that. And I volunteered my services at that point.

Q Okay. When you refer to a he, who is that?
A Mr. Gillen.
Q And when you first were contacted, was it your understanding you would be preparing a rebuttal expert report as you have, or sort of an affirmative or initial expert report?
A I didn't know one way or the other.
Q Okay. When did you come to the understanding that you would be providing a rebuttal report only?
A Oh, as soon as -- this was part of the agreement. As soon as I agreed to be on-board, he made it very clear what I was going to be asked to do. And then all these reports were being sent, were sent to me quite soon afterwards.
Q Okay. Prior to these contacts that you recall happening in February, had you had any contact with the Thomas More Law Center?
A I'd never heard of it.
Q Okay. Prior to your involvement in this case, did you have any affiliation or relationship with the Discovery Institute?
A No. No.
Q Okay. Have you ever had any contacts with the Discovery Institute?
A Not as far as I know.
Q Okay.
A Though there may be people who are members of it who didn't reveal this fact to me. I --

Q Okay. You have an understanding of what the Discovery Institute is?
A Yes, yes, I do.
Q And what is that?
A Well, I guess it's what, the leading Intelligent Design think tank in the United States. It's located in Seattle.
Q When did you first become aware of the Discovery Institute?
A Well, it publicizes its activities quite a lot. And various notables from the Intelligent Design movement have made reference to it and so forth. And so it's kind of like a mecca for that, I would say. And I think it may even have had a prior existence as a general thing for bringing together science and religion before it became so clearly identified with Intelligent Design.
Q So is it fair to say that you've known about them for a number years?
A Yes, yeah.
Q I understand you teach at Warwick College or University?
A University. And it's pronounded Warwick. The W is silent.
Q Okay. So W-a-r, wick?
A Yeah. Just like Greenwich, in Connecticut. Sort of the same idea.
Q Oh, okay. Warwick College?
A University.
Q University, I apologize. What department do you teach in?

A Sociology.
Q Okay. Is there also a science department at Warwick?
A There's not a science department but there's a science faculty, which has several -- you know, the normal array of sciences in them.
Q And are they part of a particular department or school?
A Well, we're organized in a way that's not dissimilar from American universities where we have faculties of, you know, arts, social sciences and natural sciences. And sociology is sort of the flagship discipline in the social science faculty, but there is a natural science faculty which has, I guess what you'd be referring to as sciences.
Q Okay. And when you talk about natural sciences, that includes biology, chemistry, physics?
A Yes, it does.
Q Okay. Is Intelligent Design taught -- to your knowledge, is it taught in any classes at Warwick?
A Philosophy.
Q Okay. Do you teach anything about Intelligent Design in any of your classes?
A I have.
Q Okay. And which classes do you teach it?
A Well, we have a master's program in philosophy and social theory which is co-taught with the philosophy department. And there we look at issues of science and religion and how

it -- and in particular how one explains religious belief and stuff of that kind.

Q Okay. To your knowledge, is Intelligent Design taught in any of the natural science courses?

A I can say this. That it has been discussed, especially this sort of mathematical side, the Dembski side has been discussed in the mathematics and statistics department.

Q Do you consider mathematics and statistics part of the natural sciences?

A Yes, I do.

Q Are you aware of whether Intelligent Design is taught in, for example, biology class, any of the biology classes?

A I don't believe it is.

Q Okay. And how do you know that Mr. Dembski's, and that's D-e-m-b-s-k-i, Mr. Dembski's work has been discussed in mathematics or statistics classes?

A Well, because sometimes there would be these notifications about general talks on campus by, you know, professors of mathematics or statistics becaise we have kind of an implied mathematics department. So this would be kind of a natural popular topic to sort of go into. And so would be through that, through publicity. But I have not attended the talks on the matter.

Q Do you know whether the individuals who have taught about Mr. Dembski's work have been supportive or critical?

A My understanding is they've been sort of open-minded. I guess that would be the way to put it.
Q Okay. Your specialty in the social sciences is social epistemology?
A It's kind of a field I founded in a way.
Q Okay. Can you explain to me what that is.
A Okay. It's -- well, first of all, it's a field that has both empirical and normative dimensions. So I'm concerned not only with knowledge as it actually is in terms of historically and socially how it's developed, but also with policy issues about things like how universities should be organized, what should research policy be, what sorts of things should be taught in school. So it has this kind of normative dimension as well. And it tries to bring together stuff from the humanities and social sciences that traditionally have been sort of operating quite -- in quite different fields, in quite different ways, talking about rather similar matters. And so I try to bring it all together as a kind of synethetic field. And I founded a journal by that name in 1987, it's the title of my first book. And I guess I'm the person most closely associated with it, though there are people throughout the world who associate with it as well. And if you were to do a Google search, you'd see there's some courses taught in it and stuff like that.

Q You described some of the background and some of the disciplines that social epistemology brings in. But I was going to ask you, define social epistemology, or finish the sentence, social epistemology is, how would you do that?
A Okay. It's the empirical and normative study of the social foundations of knowledge.
Q Empirical and normative --
A Study of the foundations of knowledge, of the social foundations of knowledge.
Q When you're using the word normative, what do you mean?
A I mean -- I mean talking about things how they ought to be, sort of from a policy perspective.
Q And when you use the word empirical in this sense, what do you mean?
A Studying things as they are. Right. So historically or sociologically. So it has both dimensions.
Q Steve, you're doing something that I often do as well which is speak very quickly.
A Oh, sorry.
Q And for the court reporter, it'd probably be easier if you can just slow down a little bit, and I'll try to do the same. How does the subject of scientific knowledge fit into your -- the discipline you founded of social -- of social epistemology?
A It's probably the main thing I talk about. I'm primarily

concerned with organized forms of knowledge that have a large amount of social legitimacy. And so the kinds of things that we normally call science become very central to that understanding.

Q And given your work in this area of social epistemology as it applies to sciences -- to science, have you arrived at any conclusions about the nature of scientific knowledge?

A Well, yes. I mean, some of them, I think, are fairly obvious. Namely that science changes over time. For something to be called a science it has to be universalizable. That's to say it has to be more than just specialty pursued by a restricted group of people for very specific ends. So it has to be more than a cult. It has to be something that in a way could be spread and disseminated throughout the world ideally. Science also tends to be something that tends to break down traditional social barriers. So it tends to be critical of taken for granted notions. So in that respect, science often exists oppositionally with established authority. Science tends to also be progressive in its outlook, and putting forward new possibilities for the way people can be and act in the world. I mean, those are sort of the general kinds of things. And there is a tendency for things that previously were not science and let's say were traditional forms of knowledge, or common sense, or even cult issues to become scientific by

certain kinds of means of institutionalization which we often associate with the rise of methodology and stuff like that. I mean, those are just a few things that --

Q Can you explain what you meant -- mean by that last conclusion that things that were not considered science before become institutionalized by virture of methodology?

A Well, I mean, if you were to look at the history of science in the west, let's say, all the basic ideas originated as kind of metaphysical notions, and were pursued pretty much as, you know, as something along the status of, you know, sort of like a world view or something. But then over time, a group of people would get together and try to institutionalize a more rigorous way of discussing and testing the kinds of claims associated with this metaphysics. And this then turns out to be where it becomes scientific. So it sort of makes a sort of transition from being a metaphysics to it being something that's methodologically testable. And you do typically need special institutions for that, so that in the history of the west, something like the Royal Society in London, which is a very -- which is an organization that was basically self-selected in the sense that you had a bunch of people who are interested in natural phenomenon getting together and getting a kind of chartered, protected status from the king to take what had been previously metaphysical questions that were actually the

causes of religious wars in Europe, and turned them into something that can be debated in fairly restricted terms.

So in terms of experimentation, in terms of mathematical formulation, the kinds of things that we associate these days with the natural sciences. And that's often seen as kind of an iconic event in the beginning of the transition from metaphysics to science. And that sort of thing does seem -- that is quite characteristic, you might say, of the way in which knowledge develops. It does start with these kind of broader, more metaphysically inclined things, and then moved into these more rigorous, more specialized kinds of forms.

Q And I think I know what you mean. But could you just define how you're using the word metaphysics or metaphysically here.

A Okay. I mean a sort of totalizing world view that people sort of believe on faith and where there's no clear criteria of testability. Kind of like you're either a believer or you're not. And this is why it would be the source of wars, right, because in the sense of if you don't believe in my god, or you don't believe in my scheme of things, then you don't deserve to exist, right? Where there's a sense in which the ideas are so closely associated with the people, right, that, you know, you've got to get rid of the people in order to get rid of the ideas. Whereas in science, you know, through methods of experimentation and testing, we can get rid of the ideas and still keep the people alive.

And this is a very important -- you know, this is a very important moment not only in terms of the history of knowledge, but also in the history of civilization, all right, that we're able to sort of act in this kind of second order fashion where we can, you know, distinguish ourselves from our ideas, and contest the ideas, and still leave the people standing.

Q And so this transition from metaphysics to what the Royal Society was doing is sort of a differentiation between non-science and science?

A In a manner speaking, yeah. That would be -- from a sociological standpoint, that's certainly what it looks like.

Q And again, I'll ask you just to slow down a little bit both so that I can follow and we can get a clear record. Did a transition of this nature occur in the field of biology?

A Well, not in a straight -- it has in a general kind of way. Okay. I -- can I go into some detail in the answer?

Q Whatever you feel necessary to answer the question. I enjoy learning as well as litigating, so go ahead.

A Okay. Well, biology as it exists today is actually a very wide array of disciplines, right, ranging from very qualitative approaches like you see in natural ecology where you're basically looking at animals in their native habitat, right, to very sort of quantitative and experimental work which, you know, where one needs to be sort of trained in the

highest levels of computer simulation and mathematics and all the rest of it. And these fields are really quite different, require quite different expertises. They're credentialed in quite different ways. And the reason why they're all called biology has a lot to do with the fact that they sort of descended from a sort of common conception that really gets -- begins to get crystalized in the beginning of the 19th Century when the word biology gets coined. The word biology doesn't really get coined until about 1810 by Lamarck who is one of the early evolutionists.

And so there is a sense in which the field -- yes. There is something of that process. But it isn't like all the biologists at some point got into a room together and said, okay, you guys, we're going to pull all this stuff out of metaphysics and move into science. It wasn't as straightforward as that. Rather what you had was a gradual distinguishing of biology, and then specialization where each of the specialized fields start to do something like what the Royal Society did for natural philosophy and physics in the 17th Century. So the general answer to your question is yes, but not exactly. See, the Royal Society's a a good example because it's a very simple example and it's a very old example, where as it were, all the different branches of science are sort of in a sense being conducted together in the same place, separated out from whatever metaphysical or

religious disputes they can get into. But we're now in a much more complicated situation. And biology's a science that, in a way, has this very kind of heterogeneous line of development. So there is no moment, you might say, where all of biology went from being non-scientific to scientific. It's really different fields happening in different times by different means.

Q Was there a point in time though that the outcome was it had transitioned from being largely metaphysical to scientific?

A Well, in the sense that we've been talking about so far with regard to coming up with ways of resolving intellectual disputes, that when they were in their metaphysical form could not be resolved. Yeah, it's true that probably for all these fields, there's now -- and the way you see it is that there are these various, you know, peer reviewed journals and things like that through which these disputes then have to sort of channel themselves in order to be resolved or at least, you know, sort of advanced in certain ways.

Q Okay. Can you describe for me what -- what form biology took, or the area that biology now covers while it was still in its metaphysical form?

A Yeah. I think one thing here -- I think the back drop -- okay. Let me start from the very beginning and then move -- I don't want to have to go do the whole history.

But if you were to look at somebody like Aristotle who

is kind of the benchmark for all knowledge until the 17th Century. He has a very unified theory of motion. In other words, physical motion and what we would call biological motion, so organic development, you know, the ways in which animals change, this kind of stuff, was all covered under the same theory. Okay. And it was a theory where, in a sense, all the motion was directed. So even the physical motion, everything had its natural place, right, so it's very teleological in that sense. Well, when you get the scientific revolution with people like Galileo and Newton, the physics part of this gets pulled out. And it gets made to look like pretty much the way we think of physical science today. And the Royal Society is a very important institutional benchmark for establishing that. But this still left all the rest of the stuff, right, that Aristotle was dealing with. And most of that went into biology, okay?

And that basically has to do the stuff -- has to do with stuff that cannot be reduced to just sort of general physical regularities for whatever it -- at least not prima facie. Okay. And it was in that context that the word biology got coined, the idea being, and this is where they sort of play with the Greek root, that there were sort of internal laws to life that as it were were autonomous from the general physical laws that governed nature more generally. So if you imagine, for example, an organism that's able to retain its

form despite changes in the physical environment, that's the kind of thing biologists were always fascinated by, and still are fascinated by. And it does come up in these kinds of debates that we're talking about here, the deposition, right. Where there's a sense which is there's this physical law out there, it sort of sets these various -- the sort of kind of regular natural force, but neverthless, there are certain forms that resisted in some way, that managed to survive, that managed to flourish in spite of changes in the physical condition. And this is what biologists were, generally speaking, interested in.

And so then the question becomes, well, does that mean there's a special life force, some kind of vital principle that governs all this stuff? Or can that stuff itself be reduced to certain kinds of physical laws. Okay. Now, most of biology has gone the latter route, and in different ways, at different points. But there still is this over-arching question about how do organisms manage to retain their form in the face of massive environmental changes very often? Which, you know, and so in that sense, there is still a kind of open question that in a way hasn't been fully reduced from its metaphysical form into science.

Q Are you familiar with William Paley?

A Yeah.

Q Where does he fit on this continuum between metaphysics

and -- and sort of, I think what you've characterized basically as standard science as we know it?

A Well, remember, he's writing in the late 18th, early 19th Century. And so really, his model of science is someone like Newton. And in a sense, he's giving, you might say, a sort of -- a sort of metaphysical underpinning to what he believed Newton had already established, because Newton himself thought he was looking into the mind of God. And basically, in presenting the laws of physics, was sort of presenting the interface through which God communicated with creation. And Paley is basically trying to provide a kind of -- the metaphysical principles that make sense of this view, and says, look, basically you have to -- if Newton -- if what Newton is saying about the universe is correct, that it is governed under these limited set of laws and principles, then there has to have been some design.

And then this becomes a kind of indirect argument for the existence of God. He's not the first person to invent this, by the way. But he is the one to really revive it in the context of Newtonianism. So in a sense, it becomes very much associated with a kind of modern science argument. It's an attempt to, as it were, to keep natural theology in locked step with developments in science. So he is -- now, what this -- what this means then is it does kind of lend itself to the idea that you might be able to think about the laws of

nature in the physical world as kind of an organism created by a divine creator, and then imagine that, you know, at a kind of lower level, the natural organisms are themselves kind of like this, are themselves designed according to a plan. So in other words, he was kind of -- he was trying to minimize the difference between the Newtonian view and the stuff that Newton couldn't explain about the nature of life. He was trying to show that in fact this stuff could be put under a sort of common unified framework.

Q In your curriclum vitae, you list on page -- at -- I'm sorry, let me mark as Fuller Exhibit 1 your report, if you can reach that.

A Oh, okay.

(Marked for identification Fuller Deposition Exhibit No. 1)

BY MR. ROTHSCHILD, CONTINUING:

Q Do you recognize the document I have marked as Fuller Exhibit 1?

A Yes.

Q What is that?

A It's a document I wrote, the rebuttal. And it also includes my curriculum vitae.

Q Okay. On page six of your curriculum vitae, you begin a multi page list of journal articles, paren, refereed. What do you mean by refereed?

A Well, that there was an open question as to whether it'd be accepted into the journal.
Q Okay.
A Right. So somebody else had to read it and make a decision. And very often, corrections were involved in actually getting the thing into print and so forth.
Q Okay. So in your field of sociology, is that the general process for getting an academic article published?
A Yes.
Q And when you talk about refereed in this context, what does that process entail?
A Well, it can vary tremendously. I mean, there's an official story and there's a kind of real story. I mean, the official story is you look for a person who's an expert in the area that the person's written about. And typically, you also look for a kind of general reader in the field because in a sense, you want articles that are going to be interested to a sort of larger constituency than just a specialist. And so you at least have two kinds of readers looking at the thing to determine whether it's good or not. In practice, you often end up going to the people who are willing to do it. Refereeing tends to be quite a self-selecting process and practice. And because it's time consuming, you're generally not paid for doing it, it's a thankless job, actually. And it takes away from your own research. So in a sense, we

never get referees that are quite as good as what -- what the process would seem to suggest. So that's why I say there are two different stories. And I speak as someone who's been a general editor. And we call ourselves a peer reviewed journal as well. But, boy, you know, we often have to rely on the same peers.

Okay. And this can -- we worry it can have a kind of effect on the cast of the journal, if you end up having certain people refereeing lots of articles, and their biases, as it were, comes out, and you have no way of independently judging that. Now, if you have a strong editor, an editor should -- a strong editor should be able to independently judge whether or not the so-called peers have had it in for the author. But sometimes that's not the case, and you just basically have to fall back on what they say. So there is also this element of trust which I personally am a little uncomfortable with. But it is an acknowledgment that, you know, fields of academic life have become so specialized that we're sort of forced to go down this route because, you know, people don't want to make fools of themselves in print, publishing things that are utter rubbish. But it's a very imperfect process. And I myself, in one of my books, Knowledge Management Foundations, has an appendix -- I have an appendix on the peer review process which was based on the big global cyberconference I did a couple of years ago on

peer review and the social sciences, with all the problems that kind of arise.

And it's not that the idea of peer review is so bad. It's a good idea in principle. And in fact, when one says what the principle is, it makes perfect sense. But in practice, it's diabolical because there is very little incentive to actually engage in it. And so you end up having just a certain group of people doing it. And so you have to wonder, well, why do they do it? Right. And what's in it for them? And those -- and there are cases, for example, where articles have been peer reviewed, rejected, and then the content of the articles end up getting republished under the author's -- the reviewer's own name, or the reviewer's student or somebody like that. So there are all these potential abuses of the system as well. So I don't want to be seen, even though it's true that this is kind of the principle that, in a sense, we adhere to when we publish stuff, I don't want you to get the impression that we're -- at least that I'm completely satisfied with it. I think there are a lot of problems.

And I think especially in cases where people are doing stuff that's quite controversial scientifically, you know, where you're threatening kind of taken for granted notions, that this could be really problematic. This could be really problematic. But what is also true is that there -- one has

come up with a next best solution to this. So we're sort of stuck with it for the time being. But it is something that has to be closely monitored. And I would say that peer review is most reliable with normal science. In other words, standard issue science where it's quite clear from the outset what is this person trying to contribute to, there's already establish body of work in the area, and you can tell in a fairly routine way whether this person's got it right or not, because mostly what you're doing is a competency test then. And then you don't have -- and in a sense you figure, well, if this person knows what they're doing, their conclusions follow. But when you're dealing with the fringe areas, where things are kind of controversial, then peer review isn't going to be that effective.

Q And are -- where does Intelligent Design --

A Well, in the fringe area -- I mean, I think in the fringe area. I think it's very difficult to peer review intelligence. I can see it pretty obviously from looking at the materials in the area. This would be very difficult stuff to referee because it's really putting together very unusual combinations of things. Okay. And so you're wondering who's the expert here. Right. And that's not clear.

Q And when you characterize Intelligent Design as a fringe area, why do you do that?

A Well, because it's a minority area in several different fields in which it participates. It's by no means the majority field in any of these sort of established disciplines of science in which we would talk about having departments at universities.

Q When this peer review -- and let me -- well, let me just back up. We're using the word referee and peer review. Are those basically the same thing in your discipline?

A Well, if you're engaged in the peer review process, the way it happens is you send an article out to referees, right. The referees are the peer reviewers, right. And they come up with reports which then go to the editor. And the editor somehow takes a judgment on this. Now, how exactly the editor does this is it varies, okay. I mean, some editors don't have any problem with discarding the referee's reports if he or she believes that these have been biased and tainted and all the rest of it. But generally speaking, what the editor does is does some kind of weighting of the respective merits, and then writes back to the author and saying, look, we're accepting or not accepting the article on these grounds, and some aspects of these peer reviewed reports are mentioned to the author as the reasons for it.

Q And I'm a little unclear of whether this process begins with the submission of an article to a particular journal, or whether the referee process precedes submissions, or how that

works?
A Well, let's say you're a scientist, and you write an article, right. And you want it to be published. You will send it to a journal, you know, presumably a peer reviewed journal if you want to get some professional advancement. And then the refereeing process starts then.
Q All right. And so -- and that's the same for --
A Oh. But may I make a correction? Sometimes, of course, and this has been true with a lot of -- lot of my writing, you get invited by the journals, okay, to submit stuff, but still it goes through a peer review process. But normally, there's a little more give and take because you wouldn't have been invited if they didn't think you were at least half competent. So that typically there's some negotiation that takes place, right, so that rarely are you rejected outright when you've been invited, but you may have to substantially rewrite what you've done. Whereas with the other process, where you're sending it in cold, you might just be rejected outright.
Q Okay. When you were retained as an expert by the Thomas More Law Center for the defendants, what were you asked to do?
A What was I asked to do? Well, I was asked to write a rebuttal to these six guys who are on your side, I guess that was -- that's the most straightforward answer to your question.

Q Was there any -- were there any more specific instructions or agreements about in what respects you would write rebuttal to them?
A Well, I would write rebuttals with regard to my expertise in the area. I mean, I made it clear at the outset, for example, you know, I'm not familiar with the textbooks that are under contention. So I don't talk about those things. I don't know about them. But what I do know about is the general tenor of the Intelligent Design movement in relation to other developments in biology and in history and philosophy and sociology of science, and I'm more than -- was more than happy to comment on those, and especially after reading the reports. Because actually, I mean, I took serious objection to a lot of the things that were said. I have no problem doing that.
Q Okay. And is there a particular area of expertise that you brought to bear on rebutting the plaintiff's expert reports?
A Yes, I think so. And I think this has to do with the nature of science itself. Okay. Because this is something more than whether somebody's competent in a particular specialty within science. But there's an issue about what is science and how one determines that. And that involves knowing something about the larger historical, philosophical and sociological trends in science by which science gets defined and redefined because those are -- it's going to be in that

broader perspective that one can then get some perspective about whether these newcomers like Intelligent Design really fit the bill or not. You know, I mean, you can't just judge it in terms of already existing specialties. At least this is my view because I'm not a specialist in any of the sciences that are under consideration here. And I make that clear.

Q Okay. And so if I understand you correctly, what you -- the expertise that you bring to bear on this is on the nature or definition of science?

A Yes, which is something that professional scientists are not necessarily competent to speak on.

Q Are there particular disciplines or areas of expert -- of education or experience that you think are necessary to weigh in on that question?

A I think you really do need to know something about the history, philosophy and sociology of science. And you need -- and science understood in terms of the full diversity of fields that through history have been called science. You really need to have some grounding in that. It is all too easy to just generalize from your own specialty, right. Or as sometimes as actually has happened in philosophy, generalizing through physics, and making it look like all of science has always been like that. And so that's -- that's the real -- that's the real problem, right. And especially

for people trained in a particular science, they are trained how to do that science, and they do it perfectly well, and their competence is fine. I'm not questioning that. But in terms of what makes it a science, you know, what makes biology a science, what makes chemistry a science, what makes physics a science, there's no reason to think that a biologist, chemist or physics has any expertise in that area.

Q Has your research in the area of social epistemology led you to draw any conclusions about how science is practiced today?

A Yeah, yeah. You want me to tell you them?

Q Yes.

A Well, it's just that there are a lot. One thing that I think is very important to keep in mind is that science is not something whose trajectory and the trajectory of all the fields that are called science, they cannot be explained purely by internal scientific means. Right. In other words, if you want to explain the history of physics, you can't just look at what physicists have done. You have to look at the external conditions as in various ways, promoting and inhibiting various lines of research, okay. And this is true of all the other sciences as well. I mean, in a sense, it's quite easy to imagine this in the case of social sciences because they deal with social things, so you would expect these things to be normally -- you know, affected by society. But it is no less true of the natural sciences.

And one of the things, of course, that has happened in the 20th Century is that the natural sciences have become increasingly involved with government and industry concerns. And this had led to development of very large scale instruments and large scale research programs involving nowadays dozens and sometimes hundreds of people. And so we talk about big science, right. A transition from little science to big science, where it's quite clear that science reaches this kind of size because of the external factors that are promoting it, largely because they see themselves as beneficiaries. So it's not an accident that nuclear physics and the search for sub-atomic particles starts to really gain some momentum with the rise of the atomic bomb. That's not an accident. They're intimately connected, it's the same people involved in them, okay.

And likewise, if you look at the period we're living in now where the biological sciences really have eclipsed the physical sciences as a sort of dominant areas of research and expansion and so forth, we can talk about two things. We can talk about the decline of the cold war, which leads to the retreat from the physics funding. But on the other hand, we can -- this opens up a kind of market for science, right, and the market tends to be consumer driven. And so pharmaceutical industry, other areas -- biology can be very easily turned into something that's niche marketed in various

ways. So you can find a gene for something, and then this can cure people who have that disease. And then you've got a potential for a market opening up. And this explains why in the biological sciences, say, there's what we would call uneven development, right, where in a sense some of the more traditionally naturalistic, and I mean naturalistic like ecologically oriented, parts of biology are kind of starving sometimes because unless they're connected to something like global warming, all right, or the environmental movement, there's not a lot of money around just to study animals in their native habitat. Okay. However, if you happen to be on the sort of molecular biology side of things, there's loads of money around.

And so what this means then is that the way science is developing at the moment which reflects kind of the way in which the market is operating means that science is very messy, very divergent, right? It's not like the way physics was, let's say 50 years ago, where one could talk about, you know, unifying theories and of this. And not surprisingly, during that period when physics was supreme and was sort of unifying all phenomena, there was very strong centralized state funding in physics, and it was very much part of a kind of state effort where the race for science was kind of an analog to the race, you know, to be supreme in the world. The U.S. versus the Soviet Union, I'm thinking of here. But

now that's all changed. And so you end up getting this very kind of variegated picture of science, where there's very little unity going on, and where the scientists really aren't in full control of the research agenda anymore. I mean, there are other factors. I don't want -- I don't know how long you want me to go into this. But there are lots of other factors as well which are really changing the character in which science is pursued. So a lot of the models from, let's say 50 years ago, that were very physics based, don't really apply any longer in the kind of world we live in.

Q I think I recall from earlier this morning, the only expert report of defendants you read was Mr. Meyer's -- Dr. Meyer's?

A Yeah.

Q Was -- did -- was there anything in that report that you disagreed with?

A Disagreed with? Yes, actually. Yeah, yeah. I've got to say, I think the demarcation issue is a more serious issue than he makes it out to be. I mean, if you recall, part of what he wants to say in his report is that -- the philosophical problem of demarcation of science and non-science is kind of a non-question, and that for people like Pennock and others to kind of rely on that so strongly is kind of to miss the way in which the philosophy of science is progressed. My own view about this, which I mention in the rebuttal, without having read Meyer, I hadn't read Meyer

when I wrote the rebuttal, is that basically the demarcation problem is actually quite a significant problem, it does apply in this case but it has to be understood properly. And the problem is that from the time that Michael Ruse entered his testimony in the Arkansas case in 1982, there's been a kind of a systematic misunderstanding and even vulgarization of what the demarcation is about. And I think that's kind of carried on into Pennock's report and others as well. And I think Meyer in a sense kind of -- kind of thinks that that is the demarcation problem and wants to avoid it like the plague, not surprisingly. So I found him a little too kind of defensive in that regard. Yeah, I guess that would be the main -- the main kind of objection I would make. I mean, I think that the demarcation issue needs to be revisited, understanding what the point of it was.

Q Okay. And -- and do you have a view on whether there are demarcation criteria that distinguish science from non-science, or from pseudo-science?

A I think, yes, in a general way. I mean, the problem is that they're not robust -- they're not -- they're not -- they're not universalizable or specifc enough to satisfy philosophical criteria. And that's why the project was abandoned, because the philosophers couldn't agree amongst themselves on the specifics. But it seems to me the general -- the general understanding is correct. And that

has to do with the issue of testability. So I don't -- so the basic point that everybody always points to with regard to demarcation criteria is correct. Namely, it's testability, and where testability is understood in a way that echos back to one of the answers to the earlier questions; namely, a conversion of what might be seen as metaphysical issues into something that's methodologically tractable, right.

Where you could figure out criteria by which you could decide whether a theory is, you know, improving itself, getting closer to its own goals, whether it's taking evidence seriously, and in that sense, making that transition from metaphysics to science, right. And yes, that's what the demarcation issue is about. Does an activity display that kind of pattern? That's basically the question that one has to pose to demarcate science from non-science. Because you could easily imagine a metaphysical position just entrenching itself over time, and then when people make objections to it, right, it doesn't become more specific, it doesn't become more precise, it doesn't shift its means of defense. But what it does instead is just to repeat itself.

Q So am I correct in understanding then that you look at testability as a criteria that one can use to distinguish science from non-science?

A I believe, yeah, if understood properly, that is possible.

Q Possible, or that is correct? I mean, is that a criteria that you would use to say, all right, this field of inquiry is scientific and this field of inquiry is not scientific?
A Yeah. But see, the key point here --
Q Can I -- you said yeah, and I want to -- that -- is that a yes or a no?
A Well, I want to clarify what my answer is here, okay?
Q Okay. Fine.
A It -- is it -- as long as you understand this as a dynamic process, so in other words, no science, and this applies no less to evolution than to Intelligent Design, can make its claims testable, all of its key claims testable at any given moment in time, right? I mean, what we're looking for is whether the research trajectory, the way in which the research has been developing over the course of its lifespan, whether it shows a tendency toward making more of its claims testable. That is what we're looking at here, okay? So, for example, I don't think any evoluntionist would claim that all evolutionary claims are testable. But one can say there's been some improvement since the beginning of the 20th Century. And I think the same can be said of Intelligent Design.
Q So just to back up for a minute, if you were looking at an area of science -- of inquiry and trying to determine whether you considered it scientific, what you would look at is

whether the research trajectory is making more of its claims testable?

MR. GILLEN: Objection to the form.

THE WITNESS: That's -- what?

MR. ROTHSCHILD: You can answer.

MR. GILLEN: Go ahead, you can answer.

THE WITNESS: Yeah. That's -- that's right. That's right. And the thing is so it does require that you know history of the program. You have to have -- you have to have kind of an accurate understanding of the history of the program. You cannot -- I mean, one of the key philosophers of science of the last 50 years who Meyer actually cites, Imre Lakatos, L-a-k-a-t-o-s, he was very much an opponent of what you might call instant rationality, where in a sense you can do a snapshot of a science at a given point in time and say, well, are the claims testable? Yes? No? Science, not science. That's not how you judge it. You have to look at the history. You have to kind of get a sense of the trajectory, where it's going with what it's doing. Not just at one moment in time because at any given moment in time, no theory is going to look perfect. Even the best theory is going to have a lot of its major claims untestable.

BY MR. ROTHSCHILD, CONTINUING:

Q Are you aware that Dr. Meyer has withdrawn from this case?

A Yes, I am.

Q Okay. And -- and by the way, have you ever spoken to Dr. Meyer about Intelligent Design?
A No, no. In fact, it only dawned on me once I got retained that in fact that there is -- I have an essay that appears in a volume that he co-edited. And because I was in contact with the other editor, John Angus Campbell, I hadn't realized that Meyer was actually on-board with this, because my essay is actually one that was originally published in a journal which Meyer had nothing to do with. So, no, I had no contact with Meyer.
Q And you anticipated my next question. You do have some relationship to Dr. Campbell?
A Yes, I do know Campbell, for many years.
Q And have you spoken to him about Intelligent Design?
A I don't think so. I don't think so. I mean, he -- you know, if you mean it literally, like has he and I ever had a conversation about Intelligent Design, the answer is no.
Q And are you aware that he has withdrawn from the case?
A I didn't even know he was on the case.
Q Okay. He was. He's not. Now you know. Are you familiar with William Dembski?
A Oh, yes.
Q And have you read any of Dr. Dembski's work on Intelligent Design?
A Yes. Yes, indeed. And I've read some of the responses to it

as well. And I've heard him speak many, many years ago. Before he became famous.

Q Before he became famous?

A Yeah, yeah.

Q Are you aware that he was retained as an expert in this case?

A I can't -- maybe Pat did say this. I don't recall right this minute.

Q Okay. And I would take it then you're not aware that he's also withdrawn from the case?

A No, I didn't know that.

Q No?

A No.

Q Okay. In -- have you ever spoken to anybody from the Dover community about the facts relating to this case?

A I don't even know where Dover is.

Q Okay. Eventually you may have to visit?

A I know, I understand.

Q Have you read any of the depositions taken in this case of people from Dover or experts?

A Well, no. I haven't read the depositions, no.

Q Okay. What -- were you provided any documents to assist you in the preparation of your report?

A Well, the -- the expert reports that you -- for your side. Those.

Q Right. Anything else?

A I also was provided some of the initial -- statement of the actual Complaint that was filed.
Q Okay. And what about the answer to the Complaint, did you receive that?
A I don't know. I don't know.
Q Okay.
A I mean, I really have focused my attention on rebutting your experts.
Q Okay. And I understand from your report you have not reviewed any textbooks being used in the --
A That's correct.
Q Okay. Do you have an understanding about how Intelligent Design is being presented to students at Dover?
A Not specifically. I can vaguely imagine, but I don't have any specific knowledge.

MR. ROTHSCHILD: Okay. Why don't we take a short break.

MR. GILLEN: Certainly.

(A brief recess taken at 10:26 a.m.)

MR. ROTHSCHILD: Back on the record.

THE WITNESS: I was told about Dembski. I had confused him with Behe. But I was told about Dembski's withdrawal.

BY MR. ROTHSCHILD, CONTINUING:
Q Do you know anything about Behe? Withdrawn. So you are aware of Dr. Dembski's withdraw?
A Yes. I had confused the two in my mind because I knew one of

them had gone, and that's why I was consulting with --
Q Okay. When I asked you before whether you had read any of the work of Dr. Dembski, was there any confusion there?
A No.
Q You have read it?
A Yes.
Q You have read Dr. Dembski's work. And can you describe what of his work you have read?
A Well, let's see. That main book of his that he published with Cambridge now about five years ago, Detecting Design, I believe. I forgot what the exact title of it is. But the one that in fact has been subject to a lot of philosophical discussion which tries to come up with the explanatory filter notion of design.
Q Okay.
A That's the main work of his I've read. I think that is in fact the main work of his in a sense.
Q Okay. And when you read it, did you read it all the way through?
A No.
Q Okay. What did you read from it?
A Well, I dipped into it. And I also -- there were some articles that he had published that were taken from the book which I had read as well. And I realized that they were sort of -- they came from there. And that's one reason, perhaps,

why I didn't buy the book. But so I have read a couple of chapters from it, you might say.

Q And do you recall, is that the Design Inference that --

A Yeah.

Q So you've read portions of that book and articles that are --

A Yes.

Q -- drawn from that book, or were the subject, the content of that book?

A Yes, indeed.

Q Okay. Other than that, have you read any of Dr. Dembski's work?

A I dipped into some other things, but I haven't -- I'm not like a student of Dembski or something.

Q Okay. And have you read anything written by Dr. Behe?

A Yeah, yeah. Darwin's Black Box. Yeah.

Q All the way through?

A No, same sort of deal, because this stuff has been also couple of chapters have been published in other places. I do own a copy of the book.

Q And I'm just trying to get an understanding of sort of how much you've familiarized yourself with Dr. Dembski or Dr. Behe's work. Let's use Behe as an example. Can you explain to me sort of, you know, what you've read and sort of how you selected within the book to decide what to read?

A Well, first of all, I first found out about both of them

actually through articles that they published often in magazines, sort of relatively high profile, general intellectual forms. And then I would go and look at the books. And then once there started to be some especially philosophical discussion about their work, I went back and sort of looked at the books a little more deeply.

Q And, I mean, what do you mean by -- I mean, you know, I have a book in front of me, and I can flip through the pages, I can --

A Well, in the case of -- in the case of Behe, I was looking through some of his work because I wanted to select a section to put in a -- in a kind of a teach -- some teaching materials that I prepared for the Open University called, Are Science and Religion Compatible? And so I had to go through and see what would be tractable for students. So I was kind of reading with that kind of eye. In the case of Dembski, I actually got quite interested in the way in which philosophers were taking it increasingly seriously, because for me, that sort of indicated quite a change in the way in which Intelligent Design was being perceived, because I remembered from the Arkansas case 20 years ago, philosophers would not have given the degree of care in the reading of his work that they are doing now. And that struck me. And that led me to sort of look at what had been going on. So in a sense, the responses to the work have kind of led me to look

at it more.
Q We talked about sciences transitioning -- or knowledge transitioning from metaphysics to science, correct?
A Yes.
Q Using that framework, is Intelligent Design science?
A It's certainly moving in that direction, yes.
Q Okay. Is it science?
A Well, again, if we're using this dynamic criteria of testability whereby over time claims that were previously metaphysical are being put in a more scientifically tractable form, the answer is yes.
Q You agree that physics is science?
A For the time being, yes.
Q Okay. Still up for debate?
A Well, anything's up for debate. I mean, the point is -- but no, the way it conducts itself is clearly science. Yes.
Q Okay. Same with chemistry?
A Uh-huh.
Q That's a yes?
A Yes, yes. Sorry, yes.
Q That's all right. Evolutionary biology?
A Yes.
Q Biochemistry?
A Yes.
Q Okay. Is Intelligent Design science in the same way that

those areas are science?
A Yes, except that it's at an earlier stage of its development.
Q Give me a comparison relative to chemistry as where is Intelligent Design in its stage of development relative to where chemistry is?
A Oh, probably when Lavoisier and Dalton were writing, late 18th, early 19th Century, where you start to get a conception that matter is made of atoms or fundamental elements, and there's some sketching out of what those elements might be and how they might combine. And you're getting also the sketches of some laws, but you still don't have anything like a periodic table, and you don't have kind of the full, systematic presentation of organic and inorganic chemistry and all that kind of stuff that you get later in the 19th Century. So I would say that. I mean, that's where I would put it. So it's relatively -- relatively young.
Q Okay. We talked about the expertise you bring to this case. And I'm just going to confirm some areas where I think you would agree you don't have expertise. You're not an expert in the science of biology, is that correct?
A Not -- not in the conventional sense. That's for sure. I mean, I couldn't do a biology experiment. I probably would be very hard pressed to publish in a peer reviewed journal in biological sciences unless it was a very general one perhaps. So I guess, yes, if that's your definition, that's probably

correct. I certainly wasn't trained as a biologist either.
Q And what was the last biology course you took?
A I taught -- took one in university at Columbia.
Q Okay. As an undergraduate?
A Yes.
Q And is that true of generally the natural science subjects like chemistry and physics and biology?
A Yes.
Q Okay. All your, what I'll call hard sciences took place as an undergraduate?
A Yes.
Q Or -- or prior?
A Or even younger, yes. I think you'll see that's also characteristic of a lot of people in my field.
Q Sure. I take it you don't hold yourself out as an expert in biochemistry?
A No.
Q Molecular biology?
A No.
Q Paleontology?
A No, but I don't think that's particularly unusual.
Q Not being critical. Just wanted to sort of make sure the record is clear.
A So do I.
Q I don't hold myself out as an expert in paleontology either.

Pat is because he took a paleontology deposition.

MR. GILLEN: I wish that qualified me.

BY MR. ROTHSCHILD, CONTINUING:

Q Do you hold yourself out as an expert in genetics?

A No.

Q How about gene sequence comparison?

A No.

Q How about information theory?

A No, though I have been a professor at a school of library and information science where such things are discussed. So some such people might listen to me. But I am not -- I don't consider myself an expert in the area.

Q What about mathematics?

A No.

Q Statistics?

A No. Though I have taught it. Yeah, elementary. It's part -- I -- since I'm a -- my Ph.D. was in history and philosophy of science, that is the kind of thing that one would teach to undergraduates to -- you know, as part of the -- as part of your teaching assistant jobs.

Q What about do you hold yourself out as an expert in the subject of education for secondary school students?

A No.

Q Okay. Have you taken any classes in education?

A No.

Q Have you taught any classes in education?
A Yes.
Q What have you taught?
A Well, I've taught a cross-listed class at UCLA between library and information science and education.
Q And what was the subject matter of that class?
A It was on my own -- my own work on social epistemology which has some credibility in these areas.
Q Do you consider yourself an expert in Intelligent Design?
A An expert in Intelligent Design. No.
Q Okay.
A I'm an expert on the nature of science.
Q Gotcha. Okay. Do you consider -- do you consider yourself -- you said that Intelligent Design is science. I think -- I think we can agree, you're basically saying it's science but not as far along as some of the other natural sciences?
A Yes.
Q Okay. Do you consider yourself an expert on the scientific content of Intelligent Design?
A I'm not sure what you mean by that.
Q Well, let me ask you, let me ask you, what is Intelligent Design?
A What is Intelligent Design? Well, it's an attempt to explain actually a vast array of phenomena, not just restricted to

the origins of life, in terms of some kind of design that was put there deliberately. Now, the scope of the theory -- the scope of this science is potentially quite large. In that respect, it's very much like information science, that in a way, doesn't have to be restricted to a single domain. So it's just not about life. It could be about anything that displays this design pattern because machines, obviously, have Intelligent Design, right, and they're not forms of life. So it is -- in a way, it's kind of almost like a second order science, like information theory attempts to be. I guess that would be how I would pitch it.

Q You used -- you know, obviously, the word design is in the term Intelligent Design.

A Yeah, yeah.

Q What do you mean by design?

A Well, it's very unlikely that the order that is produced would have come about through -- through chance, right, that there isn't some sense, some plan there that the order was meant to be there. I mean, the model for it in an artifact or a machine. Something, obviously, a human has designed. I mean, that's -- I mean, in that respect, you know, Paley sets a kind of benchmark for what the image of the -- of what the science is about. And that's why -- that's the -- sort of the natural way to understand this. And then with all the stuff that's going on now with Intelligent Design

understanding the nature of life, that's sort of an extension of the idea, because I think we have no problem with Intelligent Design with regard to artifacts.

Q And why do you say that?

A Because humans are the intelligents who are designing the things. I mean, we know where it comes from. We actually know the causal process in terms of how these things are produced.

Q And how do you understand we come to that knowledge with artifacts?

A How do we come to that knowledge? Well, largely because we could do it ourselves. Right. We can actually produce these -- we can say -- I can say, look, I'm going to design a car. I'm doing it, it's done. Here's the car. And you can sort of lay out the steps by which it happens. You can talk about the general blueprint, how the blueprint's supplied materially to make the thing run and then it works. And so you have a complete sense of that causal process there. And so that's the kind of paradigm case I would say of Intelligent Design.

Q And am I correct in understanding your testimony from a couple minutes ago that that kind of design inference, so to speak, is the model for the design inference being used for biological life?

A Yeah, I would say so. I would say that's ultimately what's

being aimed at. Yes.

Q Here's what I don't understand. And maybe you can help clear this up for me. You explained how we understand design of human artifacts from the -- and you said, you know, we can understand it because we can do it, right? How does that provide a model for design of biological life?

A Well, I think the best way to think about this is in fact with what -- imagine computer simulations which, you know, are increasingly in the biological sciences when we're trying to project backward into how life began, where, you know, we have recourse -- we of course have recourse to fossils to a certain extent. We can get some sense of what life was like in the beginning that way. And we can do some DNA testing on that. But increasingly we have to rely on computer simulations. And computer simulations are design functions, right, where you're programming a system to behave in a certain way, and then you see what the outcomes are. And you say, well, okay, let's say that I imagine that the world was designed with these three or four parameters that interact in a certain way according to a computer program I can specialize -- specify. Well, that then produced the world as we know it. Okay. If it does, right, that's a good argument for design, it seems to me. If not, you know, back to the drawing board. But the point is we're already doing stuff in science where we're actually engaged in design like

activities.

Okay. So I don't think it's so far-fetched in principle, especially in the period in which we're living, where we're doing more and more of our science on computer programs which requires that the scientist actually design the situation in which the phenomenon is going to manifest itself. I mean, so I -- I don't see -- I don't see quite the problem in principle here.

Q Well, why would the fact that humans can design a model lead us to any conclusions about what a non-human, non-natural actor can do in terms of creating some form of biological life?

A Well, just stated that way, sure. You're absolutely right. But that's not -- that's not the whole story, right? In fact, you know, this is where one -- I mean, the point is that even people who don't consider themselves proponents of Intelligent Design are in fact, you know, playing around with models that, in a sense, put them in the position of potential designers of universes. Okay. So in a sense, science is moving in a design oriented direction already. It's just the people doing it who, let's say, do complexity theory and stuff like that don't like to call it Intelligent Design. But in a sense, they're adopting the standpoint, you know, that would seem to me ultimately Intelligent Design is trying to work itself back to. That's why so many of these

arguments are arguments that, in a sense, are meant to be conducted on computers under mathematical terms. It's not -- it's not -- the old -- it is true that with Paley and a lot of these old guys, there is some kind of analogy which is parasitic on the idea that, you know, human beings are made in the image and likeness of God. So if humans can do it, then God can do it kind of in a bigger way. I understand that, and that's the theological basis for the design argument. But it seems to me now with science, we've got sort of -- we're now in a situation where the way we actually do science is one where we're in the design position, and we're kind of doing the sorts of things that let's say a creator would do if they were simulating a universe. And so I don't see the -- you know, so it's sort of a different basis for making the inference. Now, whether you're going to -- you know, I mean, I would suppose the tough question is whether there would ever be any kind of empirical way of resolving whether a simulated universe designed by a human being, to say this is how the world happened, could ever be proven empirically. And I don't know if that could happen. But then again, evolution's stuck with that problem, too. Everybody's kind of stuck with that problem.

Q One of the things you say on the first page of your report is my expertise experts to a consideration of ID in its most developed forms.

A Yeah. I mean Dembski and Behe. That is to say, not the high school textbooks.
Q Okay. So let's just be clear what you mean. And let me ask this in a couple of -- a couple questions about this. First of all, you said you're not -- you don't hold yourself out as an expert in the content, the scientific content of Intelligent Design, is that right?
A We haven't gotten back to what you mean by that yet. Can you -- you just threw the question back at me. So what do you mean by scientific content?
Q Well, okay, fair enough. What do you understand to be the core propositions of Intelligent Design as it applies to living things, biological life?
A What do I understand them to be?
Q Yes.
A Well, it depends which -- these guys don't all hold the same views exactly. Okay. That's the first point, right? Intelligent Design is, in a sense, kind of a covering term for a lot of overlapping theories, you might say. I mean, there is this business of -- I mean, that Behe emphasizes of the irreducible complexity of cellular life. But then there's also the business with Dembski and the idea of design as a kind of explanatory filter that is not as probable as just mindless natural regularity, but not as improbable as chance. So these are kind of general notions that these guys

are working with as providing constraints on the possibility for life. Okay. And they're coming at it from somewhat different directions. So, I mean, that's what -- at least that's what I understand to be distinctive about the position, right, in the sense it makes it different from what evolutionists are saying.

Q Okay. So if -- the answer to the question, you know, what is ID comprised of from a scientific standpoint is Behe's notion of irreducible complexity?

A Yeah. And Dembski's explanatory filter. And those are the basic explanatory principles, the fundamental ones that are being developed now, it seems to me.

Q Other than those two explanatory principles, are you aware of any other explanatory principles that are part of the Intelligent Design as a scientific concept?

A Well, I would say at this level of generality, those are the main ones. I mean, there's -- Meyer has this sort of an information specification criterion as well. But, you know, if you were to look at any given science, you'd only come up with about two or three fundamental principles for any of them any way. So the fact that there aren't a whole lot of them, and they all seem to overlap or have something in common, that itself is not prejudicial, it seems to me.

Q I'm not characterizing. I just want to make sure I understand what you understand Intelligent Design to be.

A Yeah. Yeah, yeah.
Q Okay. So basically, the two big principles are irreducible complexity and the explanatory filter?
A Uh-huh.
Q That's a yes?
A Yes, yes.
Q Okay. I don't mean to be scolding you. I just want to make sure the record is clear. Do you consider yourself an expert on the proposition of irreducible complexity?
A An expert on the proposition? Not an expert on the proposition, no. No, I don't do research in that area. No. I mean, you know, what I know is what I read of it. So I'm not -- I'm not adept in the area.
Q Okay. Do you consider yourself an expert in Dembski's work, including the explanatory filter?
A Not -- not -- I mean, maybe I'm not getting what you mean by expert. But it seems to me that the answer would be no. Unless you mean expert in a looser sense.
Q Well, I mean, I think you've acknowledged, for example, you're not an expert in paleontology?
A Uh-huh, yes.
Q Same as me?
A Yes.
Q And I'm trying to understand, you know, paleontology, you would agree, is a discipline that at least in part is

considered in the area of evolution?
A Yes.
Q Okay. So now I'm looking at Intelligent Design, and you've identified a couple of sort of underlining explanatory principles and I'm trying to understand sort of parallel to what you said about paleontology, do you consider yourself an expert in irreducible complexity?
A Right, okay. I'm not an expert in that area. That's correct.
Q Okay. And the same with Dembski's work?
A That's correct.
Q Okay. Do you have some familiarity or understanding of what the explanatory filter is?
A Yes.
Q And what is that?
A Well, the explanatory filter is meant to provide a kind of probabilistic space. I mean, so the key thing -- first move that Dembski makes is to translate issues having to do with chance and design and regularity in nature into probability theory. So he tries to move it out of the metaphysical space into a mathematical space. And then the explanatory filter is going to be this -- this range of possibilities between regularity, physical regularity on the one hand, and chance on the other one which design can operate. So it has to be kind of within a range of probability of certain kinds of

orders being maintained that aren't so -- that aren't so necessary that it doesn't require any intelligence at all, but also not so random that you can't see evidence of intelligence either. So it's meant to be kind of a middle ground. And it's meant to be specified mathematically. And then it's been sort of discussed in those terms, whether one can do that.

Q And do you have an understanding of whether one can do that?

A Well, it seems to me that he hasn't done it yet. But he's kind of laid out a very interesting project in this respect in that, first of all, he translates the metaphysical notions into mathematically specifiable ones, and he enables then people who are adept in these areas to be able to contest whether certain cases that might be counted as design would fall into the way he's defined it because of the probabilities that they would be maintained or not. And so when he gets into these arguments with philosophers, you know, about probability theory, right, sometimes they say he's being too strict, sometimes they say he's being too loose as to what to count as design. Because remember, we're talking about a theory of design that just doesn't cover the origins of life, but covers everything that we might think of as being design, including artifacts. And so in a sense, it's fair game in terms of the kinds of examples that might be considred relevant for falling under this filter.

And so he gets a lot of counterexamples that seem to sort of, in a way, not quite fit what he's trying to do. And he's had to -- he has to kind of respond to that. So I wouldn't say he's -- he has succeeded, but he has kind of -- he hasn't succeeded in the sense of having nailed down the filter. But what he has succeeded in doing, I think, is laying out a research project as to say to identify the parameters of this filter, which in principle, should be able to do. And the way in which people are responding to him critically suggests that it is something that one can work with and do something with.

Q Well, I think I'm understanding you to say he hasn't actually applied this explanatory filter to an aspect of biological life and shown that it was intelligently designed; is that correct?

MR. GILLEN: Objection.

THE WITNESS: But the theory is not that far advanced.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. So he has not done that yet?

MR. GILLEN: Objection to the form. You can go ahead.

THE WITNESS: Not that -- no, but I don't think he's intending to do that.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. And you're not aware of anybody else taking his explanatory filter and applying it to an aspect of biological

life to determine whether it's intelligently designed?
A No. That's -- that's -- that's right. I mean, at least not doing it successfully. I mean, you have to look at the benchmarks here for -- well, I guesss you would have to look at the benchmarks here. I mean, you might say also no one has successfully applied evolutionary theory to explain an aspect of human social life, though a lot of people have tried, but they get knocked back. So again, yes. But that's not surprising.
Q Okay. And are you aware of anybody even trying to apply the explanatory filter to an aspect of biological life to determine whether it was intelligently designed?
A No, I'm not. But I'm not an expert, as you have just pointed out. So why would I know?
Q Okay.
A It might be happening.
Q Okay. And you also said it could -- that his explanatory filter could be applied to aspects of things other than biological?
A Yes, yes, yes. It's a general -- yes. I mean, that's the interesting thing about it, yes.
Q Okay. And, for example, it might be applied to the determination of whether some artifact found lying on the ground was intelligently designed by human or not?
A That's correct.

Q Okay. And -- or -- but Mr. Dembski has not in fact done that, has he?
A Well, but a lot -- some of the counterexamples that get raised against him are of this kind. See, I don't think that's a bad way to proceed because in a sense, our understanding of what design is is much more secure in the human area. So if we can kind of get a good sense of what it means mathematically to talk about what we consider to be intelligently designed by humans, we might then have a kind of rigorous benchmark against which we can then start talking about more exotic examples, like the ones that are relevant for trying to show that life is the product of design.
Q But there -- he has had critics who have, in fact, identified --
A Things that don't fit his -- yes.
Q Well, they've actually -- haven't some of his critics said, you know, here's a test for Intelligent Design? A plane accident, a plane crash?
A Uh-huh.
Q Right? Is that right?
A Yes.
Q Or some, you know, sort of historical artifact, correct?
A Yes.
Q And have raised the challenge to Dr. Dembski to show how his explanatory filter could be used to determine whether --

whether those things were intelligently designed or how they happened, correct?

A Yes.

Q And he has not shown how that explanatory filter can address those questions, is that --

A As far as -- look. As far as I know. But it seems to me the issue here is what happens, what does he do in the future about this, because if he does come up with another version of the explanatory filter that is able to take into account the counterexamples in a way that actually makes it more illuminating and doesn't just seem ad hoc, then he will have done a fine job, all right? I mean, so the point that there are counterexamples being brought up to his theory is not ipso facto daming. It depends how he responds to it.

Now, again, I don't -- I haven't followed the latest breaking news on the Dembski research front. So I don't know exactly what he's doing with these counterexamples. But the very fact that he's kind of translated what was previously a metaphysical notion into mathematical form that allows the counterexamples to be raised is to me a step in the direction of science. And I think that's a very significant point that needs to be kept in mind here. Now, what he does after that, of course, is worth looking at. But the point is the significance of that has already been made from metaphysics to science once he put it into mathematical form and allowed

the counterexamples to be made.
Q But what is your understanding of these counterexamples? Is it that they have -- that critics have taken these counterexamples and used some probabilistic method to determine what happened to them? Or have they been raised as examples that Dr. Dembski needs to apply his method to to show that it works at all?
A Yes, the latter. I mean, but is this damning? Yes. I mean, I agree with you. But what follows?
Q Isn't the challenge to Dr. Dembski right now that your method is useless?
A The fact that you bring up counterexamples doesn't mean that it doesn't explain anything. Right. I mean, in fact the way the general verdict on somebody like Dembski is that, you know, it sort of leads -- it's kind of -- it doesn't quite fit the full range of things that we normally consider design. It tends to include certain things that we don't want to call design, and it tends to exclude other things that we do want to call design. So in that sense, the mathematical parameters aren't being set quite right. And that might indicate some fundamental flaw in the way he's conceptualizing the problem, okay? That's what the state of play is with him. It's not that he can't explain anything, but rather he doesn't quite -- the sort of universalization that he is aspiring to by laying out this model isn't

satisfied by virtue of the counterexamples that can be raised. It doesn't mean that it can't explain anything. It means it can't explain everything. Those are two different states. And a lot depends on how he develops from there.

Q Other than what we've discussed about your reading of portions of Dr. Behe's work and portions of Dr. Dembski's work, what else have you done to educate yourself about the subject of Intelligent Design?

A Well, I have looked into the -- the history -- well, I mean, first of all, a general -- a general understanding of the history of biology, and especially the way in which Darwinism has been related to these larger design issues historically, and also the way in which fundamentalist religion and so forth have played a role. I mean, I've sort of done a lot of backfilling, you might say, to get a sense of where this stuff comes from. And also to look at some of the non-evolutionary forms of biology that seem -- from the pre-Darwinian period that seemed to have some resonance with some of these arguments that we're seeing today. I mean, in a way, what it's caused me to do is to look at a lot of stuff that I've looked at in the past in a somewhat different light, because what I see Intelligent Design as doing is more so than the earlier creation, is pulling together lots of strands from the history of science in a way that's been marginalized by Darwinism, like the design argument, for

example. Sort of retaking that seriously. So it causes me to sort of re-examine the history, kind of look at it somewhat differently. It's also caused me to wonder about the extent to which Darwinism has been a scientific revolution as well. I mean, so that it's a sense in which it's been that kind -- that kind of thing more generally.

Q Couple things I want to follow up on that you just said. First of all, you referred to ID or Intelligent Design in comparison to earlier forms of creationism. What did you mean by that?

A Well, I mean the kinds of things that were being discussed in the Arkansas trial back in '82, where one was still talking about, you know, six day creation and sort of biblical literalist basis.

Q You've used this phrase ID in conjunction with earlier forms of creationism, not just in your previous answer, but also in your report. And I infer from that what you mean is Intelligent Design is a modern view of creationism?

MR. GILLEN: Objection to the form.

BY MR. ROTHSCHILD, CONTINUING:

Q Is that correct?

A Well, again, yes, in a sense. But, I mean, not all creationism has been six day creationism. So keep that in mind, that when I was answering your previous question, I was referring to -- when I said earlier forms of creationism, I

was referring to this -- this kind of form that was the previous form that was dominant in the trials that were over evolution and creation in this country in the '80's, right, which was the kind of biblical, literalist six day stuff, whereas now, we've got Intelligent Design as really being on the dock, rather than this -- at least as far as I understand. I don't -- I don't -- maybe you're going to tell me the six day stuff is being discussed. But as far as I understand, we're talking about a different thing now. But of course, there's still earlier forms of -- there are other forms of creationism that are actually scientifically more sophisticated, kind of wedded to the Paley style arguments of the past, but not necessarily committed to a sort of six day biblical, literalist view.

Q Okay. So --

A So creationism is kind of a big thing, right.

Q Right. And Intelligent Design is one --

A Part of that, yeah. But --

Q But don't --

A Some of --

Q I'm sorry, you're -- Intelligent Design is creationism; just not six day creationism?

MR. GILLEN: I object to the form.

THE WITNESS: It is a kind of creationism. It is a kind of creationism.

BY MR. ROTHSCHILD, CONTINUING:
Q Okay, okay. And when you use the word creationism, what do you mean?
A Well, I mean that -- the idea that there is a kind of a unified order to nature that is evidence of Intelligent Design. I mean, what we now call Intelligent Design, which used to be called the creator, because the creator was always the person who had the Intelligent Design. So there is this historical lineage. I don't think that's controversial.
Q Okay. When did you first start -- I mean, is it fair to say that you have studied Intelligent Design?
A Yes.
Q Okay. When did you first start studying Intelligent Design?
A Well, I don't know -- you know, it's funny. I don't know whether it was being called that then. But certainly -- see, I went to the University of Pittsburgh which is where Larry Laudan used to teach. And as you may know, Larry Laudan wrote a couple of articles that were very scathing of Michael Ruse's participation on the evolution side of the Arkansas case about saying how this was misusing the expertise and philosophy of science. And he was drawing this distinction between the difference between a theory being true and false versus a theory being scientific. And he was making the argument that in a sense, you might want to say creationism is scientifically false, which is not -- you know, which is

two different matters. And that got me interested in what was going on there with the definitions of science and so forth. So this would be when I was a graduate student, maybe in the 1980's. That's when I first started -- and so, for example, I bought the volume that Marcel LaFollette had put out on the Arkansas case with MIT. I bought that as a graduate student. And so I kept kind of some tabs on the side about what was going on with that because that seemed to be the -- the public space where my own field in the history and philosophy of science was actually having the most relevance in terms of any kind of policy issues. So I'd been keeping tabs on that over the years.

Q And -- and, you know, you used the phrase ID in its most developed forms. And then you -- and you said that what you meant by that was sort of the Dembski/Behe Intelligent Design?

A Yes.

Q When did you start studying that?

A Well, let's see. I first -- I think it was -- this may be an -- I mean, I've known John Angus Campbell for a long time, largely through the connections in rhetoric that I have with him. And he may have one time, and this -- maybe this verges on the discussion of Intelligent Design. He suggested I see a talk by Dembski, and -- and I did. And that was when I started getting -- getting interested. So I guess that would

be about 1996 maybe.
Q Okay. Do you have an understanding of what position, if any, Intelligent Design takes on the age of the earth?
A I take it doesn't have just one view. I take it that these people hold somewhat different views.
Q Meaning some Intelligent Design proponents consider the earth relatively young, six to ten thousand years, and some consider it billions of years old?
MR. GILLEN: Object to the form.
BY MR. ROTHSCHILD, CONTINUING:
Q Is that your understanding of --
A Well, do any of the guys that I considered developed think it's six to ten thousands years old?
Q Well, I'm asking you. What --
A I don't know that. I mean -- I mean, again, if we're now going to use Intelligent Design to also include all the young earth people, you know, as it were, retrospectively include them all, then maybe that's true. But I guess the people I've been reading I've never gotten the impression they believe the six to ten thousand years story.
Q And I guess I -- you know, I want to make sure, you know, we have this phrase out here Intelligent Design, and you've used the term Intelligent Design movement. You've talked about developed -- the Intelligent Design in its most developed form. So when we use the word Intelligent Design, I want to

make sure we're on the same page, okay?
A Sure.
Q And you're -- you are taking the position in this case that Intelligent Design is a form of scientific inquiry?
A Right. But I didn't have in mind that anyone who believes that the earth is six to ten thousand years old.
Q Okay. So, you know, you do have in your mind that there is a sort of defining content to Intelligent Design?
A Yeah. Yeah.
Q Okay. And do you understand that idea of Intelligent Design to take any position -- what you understand Intelligent Design to be, do you understand it to take a position on the age of the earth?
A I actually don't think that the -- that the -- that it's required that it take a specific position. But some of these guys may have positions based on their arguments. So, for example, I guess I could imagine that some of these guys may think that the earth is somewhat younger than evolutionists would say, given the nature of the theory. I could see that. But, I mean, the six to ten thousand year old figure is something that's taken from the earlier form of creationism. And I just don't believe that's carrying through.
Q Okay. So -- and -- and what I -- I mean, for example, the area of evolution does actually incorporate the sort of modern understanding of the age of the earth into the

scientific theory, is that fair?
A Oh, indeed. It's even partly responsible for it.
Q Okay. And -- and -- and -- and what I'm asking you is now looking at Intelligent Design, does Intelligent Design incorporate or take a position on the age of the earth one way or the other as part of its scientific content?
A See, I don't think -- I mean, here's where we run into the problem of Intelligent Design being relatively young science. It doesn't have as it were well worked out canonical views on everything the way you can say so easily of evolutionary theory, okay? I mean, I think -- I think the age of the earth is not -- has not become central for the kinds of things these people have wanted to do so far, okay? But, you know, so as a result, I think the question is open there. I mean --
Q I mean, right now, Intelligent Design is agnostic on that issue; is that fair?
A I guess open minded would be the word for it. I don't think -- because I don't think that -- see, I mean, you have to wait until the science kind of develops a bit more, to see -- and see them then having to deal with all these questions, because that's obviously a fair question to ask of these people, right? But I don't think there's -- I mean, there's hardly any kind of, as it were, canonical views about the fundamental principles. They're pursuing at -- pursuing

the program from many different angles. So not surprisingly, there isn't going to be consensus on this. I don't think it's really necessary at this stage.

Q Okay. And what about the principle of common descent? Do you understand Intelligent Design to have taken a position on the subject of common descent?

MR. GILLEN: Object to the form.

BY MR. ROTHSCHILD, CONTINUING:

Q And let me actually -- let me preface that, you use the word common descent in your report. What do you mean by that?

A Well, common descent, the idea that at the end of the day, all the -- there's no special creation of forms, of life forms. Rather they all come from sort of common evolutionary background that can be sort of plotted out tree-like fashion. And the point that I make in the rebuttal, which I think is something that the Intelligent Design people play around with, you might say, is the fact that there is -- that there is controversy over how exactly one establishes descent in evolutionary theory. Whether one uses purely genetic criteria where you in fact can see history -- you can see sort of that one organism came from another, or does one just look at morphological similarities? The fact that organisms are similarly structured in a way as indicating relationship. And because evolution isn't completely consistent on how they exactly map all these organisms as having common descent,

there have been some Intelligent Design people as well as some people who are -- who are working within taxonomy and don't necessarily take a view on Intelligent Design, versus evolution, saying that we may need to call into question the idea of common descent if we can't come up with a consistent criteria for establishing it. Because common descent is a dogma of evolutionary theory, which evidence gets mobilized to support. But the criteria by which you establish this common descent varies from organism to organism, and -- and depending on how -- if you map it out consistently, you can end up getting two quite different evolutionary trees.

So -- you know, so -- so -- I mean, Pennock makes the point that common descent is a dogma of evolutionary theory. It's a dogma, but it's not a fact. I mean, it's really a contested area. And intellingent design in a sense, you know, takes advantage of that.

Q Okay. What do you mean, takes advantage?

A Well, in the sense that it shows that -- and which is, I think, something that's not uncommon in evolutionary theory; namely, that there could be -- that you could have people in biology agreeing on the same principle, but having different ways of enforcing the principle, you might say. So you've got all these evolutionary biologists saying we believe in common descent. But how exactly they would show common descent between organisms may differ. But there's -- and

they do disagree amongst themselves, but they keep that to their peer reviewed journals. They don't take that as representing some kind of bigger problem in the idea of common descent itself, which is what the Intelligent Design people in a way draw attention to and try to take -- and take advantage of in that sense. Namely, showing, look, there's more descent in the evolutionary ranks than you guys are willing to admit.

Q Yeah. And I'll tell you, you know, what you wrote about common descent took my breath away because what I understood you to be talking about was a disagreement about how you classify.

A Yes.

Q You could, you know, with different methods of classification you will -- the tree that you portray will look different with one method than another?

A Yes.

Q And what took my breath away was that you would characterize those kind of disagreements as calling the entire principle of common descent into question. And I wonder from where do you extract that?

A Well, if you can't explain how it happened, if you can't have a consistent method for showing it, how do you know there's something to show? I mean, I would have thought as a basic principle of science you need a consistent methodology for

being able to show a pattern that you're then going to use as something to explain, because common descent is supposedly what evolution is supposed to explain, right? And it is a little surprising that there isn't a common method, agreed upon method for actually showing the common descent.

Q Well, you've mentioned that -- that biologists have studied and demonstrated morphological similarities?

A Sure. And that's the traditional way. That's the traditional way.

Q Okay. And they have also, and particularly in mod -- in very modern times been able to identify similarity in gene sequence?

A That's right. And they don't give you the same results. They don't give you the same tree patterns. That's the -- that's a problem.

Q Can you identify any scientists working in the field of evolutionary biology who have -- who have asserted that that disagreement in classification may require discarding the entire idea of common descent?

A Well, I think -- I mean, it depends what you mean by evolution biology. I mean, if you mean it in the broadest sense, where you're including the science of taxonomy, then you do have these people, these cladistics people who I referred to, who in fact do think that one should be kind of agnostic on the point until we get a kind of clearer

understanding of, you know, how to -- how to organize the -- the various trees. So they tend to be agnostic on evolution as an overall process.

Q Who are you talking about?

A Who am I talking about? Well, I mean, one of the main guys is called Petersen. I mean, there's a book that I cite by a guy named Henry Gee. And these are, you know, reasonable guys. But they're working very narrowly in the field of biological taxonomy. And that's all they're really primarily concerned about. And it points, I think, to a more general problem with the so-called evolutionary synthesis. Namely, that the different sub-branches of biology that are supposedly all covered by evolutionary biology in face all operate in their own independent sphere relatively speaking. And even though they're not constantly contesting the assumptions of the others, nevertheless, there are some serious working disagreements. And so if you're just focused on taxonomy, and your main thing is to try to, you know, sort of organize the species in some kind of way to make sense of, you know, of descent patterns, and you have these two alternative methods, then, you know, it seems to me that all discussions about evolutionary explanations are put on hold until you've sorted this out. I mean, that's what it looks like for somebody who's a taxonomist.

Q When you say -- what are you referring to when you say

evolutionary explanations?

A Well, I mean, evolutionary -- well, insofar -- remember, people like Pennock are claiming that common descent is the fundamental fact that evolution explains, right? But if we can't even establish consistently common descent, then one shouldn't be rushing to evolutionary explanations of something we can't give a common account of -- we can't give a consistent account of. One should get the phenomena well grounded first and then come up with the explanation. And that's what the taxonomists are saying.

Q Who?

A These -- this particular purist school of taxonomists.

Q But what are the -- are the taxonomists questioning common descent or the evolutionary explanations?

A No. They're -- well, they're saying, look, that evolutionists operate with alternative ways of dealing with the idea of common descent. Okay. And the question is that one has to sort this issue out first before one can then go and explain things because the nature of the evolutionary explanation may be different, depending on how you align.

Q Okay. And for example, an evolutionary explanation, one prominent one is natural -- random mutation and natural selection, correct?

A Right.

Q And when the taxonomists are saying --

A But that doesn't require -- common descent is a common issue from --
Q Yes. And what I'm trying to understand is, are the taxonomists saying slow down about common descent, or are they saying slow down on your explanations of how the evolution occurred?
A Well, they're saying slow down on common descent, because that's the thing that kind of really verges on their bailiwick, right, that they're really experts on. I mean, I think many of these people are just sort of agnostic on this larger point about random mutation and natural selection. I mean, at least it doesn't really enter directly into the sorts of stuff that they write about in their professional journals.
Q So you understand the taxonomists to be saying until we can agree on our methodology for portraying the tree of life, we shouldn't take any position about whether there was common descent at all?
A Well, it's not an issue they can decide. That's right. It's an agnostic issue. Right. It's outside the expertise.
Q Okay. Would you agree that paleontology is one of the disciplines that is relevant to addressing these questions?
A Yes.
Q Okay. And would you agree that a paleontologist would have greater expertise on the issues of the classification of

biological life than you do?
A Sure. But -- yeah.
Q Okay. And getting back to how I started this line of questioning, do you have an understanding of whether the -- the Intelligent Design as you've used the term in your report takes a position on the principle of common descent?
A It seems to me it's agnostic on this.
Q And then you would -- you also brought up the term of special creation. And what do you mean by that?
A Well, the idea each of the species are sort of specially created, as it were, by God or something. You know, they -- they sort of -- you know, they sort of arise and -- yeah. I guess that would be the model for it, right. That in some sense, there is no sort of common form of life they come from, but rather that each one is made specially, you know, by design in that sense.
Q And arose from where?
A I don't hold the view myself. But, you know, presumably from some divine blueprint or something. I mean, Linnaeus, the father of modern taxonomy held this view.
Q And you used the word design blueprint. But, I mean, I'm asking, how'd they get there?
A How did they get there? Well, this is -- this is --
MR. GILLEN: Object to form.
THE WITNESS: This is the -- this is a remnant of the --

this is a -- this is a remnant of the old biblical creation story. And Linnaeus was a very devout guy. I mean, and so he -- that's kind of his view, right. That God kind of, using, you know, form into matter, produced these different species.

BY MR. ROTHSCHILD, CONTINUING:

Q Something out of nothing?

A Well, not --

MR. GILLEN: Object to form.

THE WITNESS: Well, it's not quite something out of nothing. I mean, it's -- you know, it's giving form to matter. I think that's more the way to look at it, right. And that's where the blueprint part comes in.

BY MR. ROTHSCHILD, CONTINUING:

Q Yeah. And I mean, if you talk about special creation of a human?

A Yeah. That would be a prime -- yeah, a prime example.

Q Okay. And what do we mean by that?

MR. GILLEN: Object to form.

THE WITNESS: Well, I assume that -- that the human arose under special conditions that could not -- that did not derive from the formation of other forms of life. Right. So in a way, special creation is kind of the, you know, exact opposite of common descent.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. And --
A But I don't hold this view myself, you see.
Q Do you hold a view about whether evolution -- and let me back up. We've used the terms evolution and Darwinism. And in your report, you used the word Neo-Darwinism. And I would like to have an agreed term for the current scientific corpus of evolution. Is it -- what term would you use for that? Or can we agree that we'll use evolution?
A Well, I mean, technically, I guess, the Neo-Darwinian synthesis, right? So the combination of the natural history side that comes from Darwin's own lineage, so we're talking about paleontology, natural history, those kinds of things, with the genetics, right, and the more laboratory based stuff which comes together in the 1930's and '40's, which is the basis of the modern Neo-Darwinian synthesis is the basis of evolution today.
Q Okay. So when we're talking about the scientific theory of evolution, that's what we're talking about?
A We're talking about that thing that emerged in the '30's and '40's.
Q Okay. Do you hold a view about which -- whether the scientific theory of evolution has merit?
A Yes, it has merit.
Q Okay. Do you hold -- have a position about whether it has greater merit than the concept of Intelligent Design?

A Well, what do you mean by that exactly?
Q Well, you agree that it has merit. Do you -- as between the two competing prob -- well, let me withdraw that for a second. Do you think that the concept of Intelligent Design as it currently exists has scientific merit?
A Yes, I do. I mean, and let me just say this because I think maybe this is what you're asking, that I believe at the moment that evolutionary theory is better able to explain what it sets out to explain than Intelligent Design can. Okay. But both of them seem to me to be proceeding in scientific -- in a scientific way with respect to their own research agendas.
Q You say in your report that Pennock notes correctly that some ID proponents adhere to a scientifically updated version of the biblical doctrine of special creation whereby each species is individually created, right? Who -- who are you referring to when you say that? Who was Pennock writing about?
MR. GILLEN: Where is that?
BY MR. ROTHSCHILD, CONTINUING:
Q I'm sorry, it's on page three.
A No, no. I did say that.
MR. GILLEN: I'm just --
THE WITNESS: Let me think. I think this may be something that somebody like Phillip Johnson said about human

beings. So, I mean, because when I think of the special creation thing, I'm usually thinking about the extent to which human beings, right, have a sort of distinctive form of creation, because that's usually where the issue arises. So I was thinking about Philip Johnson, probably.

BY MR. ROTHSCHILD, CONTINUING:

Q Do you understand that concept of special creation to be part of the science of Intelligent Design?

A It can be. I mean, I don't know if at the moment it is. But it certainly can be, very much like the idea of design itself can -- you know, so with design, right, it starts off as this kind of theological notion that Paley cooks up. But then it gets mathematically specified by Dembski, and people can argue about it on mathematical grounds without bringing in Dembski's religious assumptions such as they are. Well, I don't see why one -- why special creation couldn't undergo a similar process, especially if one imagines -- I'll give you an analogy. The history of anthropology has had -- had a very big dispute in the late 19th and early 20th Century over the origins of human beings, with some people arguing for polygenesis, which is to say in a sense multiple origins for human being, as where each race has its own separate origin, and a kind of special creationism applied to humans, right.

And this was kind of taken seriously in anthropology and people were trying to find evidence for it. And it was done

in a very empirical kind of manner, thinking about whether it's possible for migration to have taken place from Africa to Asia and so forth. Eventually people dropped the question. But the point was that was an example of a question that was very clearly, theologically motivated by sort of special creation considerations, and then got translated into a kind of an empirically tractable form, and then was eventually relinquished. And it seems to me that perhaps something could happen to the idea of special creation within the Intelligent Design movement more generally if you imagine -- so rather than imagining as it were one big bang, you know, or one kind of moment of the origin of life, that one imagined there were multiple ones. And as it were, the chemical configurations were somewhat different in these multiple origins, and that then somehow led to the different species or families of species to exist. I mean, one might be able to turn that into a scientifically tractable proposition. I don't think it's out of the question. It probably hasn't been done yet. I don't think it's been done. But it's not out of the question. So this is where one has to look at the subsequent history of these ideas once it's put in the hands of these people for a while.

MR. ROTHSCHILD: This would be a good time to arrange lunch.

MR. GILLEN: Certainly.

(A brief recess taken at 11:26 a.m.)

BY MR. ROTHSCHILD, CONTINUING:

Q When we were discussing Dr. Dembski's work, I think, is it fair to characterize your answers as that he has -- that his concept of the explanatory filter has not been applied to specific examples in any meaningful way?

A Not as far as I know.

Q Okay. And in your view, that's not necessarily problematic for Intelligent Design?

A That's correct.

Q And that's because it's sort of -- Intelligent Design is at its relatively early stages?

A Yes. And also because the fact that he was able to put the problem in mathematical form itself marked an advance over the Paley version of it that you referred to earlier. So there's already a kind of a big leap in the direction of science by having done what he's done.

Q And then in terms of Dr. Behe's work, is that at a similarly early state, the concept of irreducible complexity?

A Well, there I think there's something different going on. I mean, this is why I say, I mean, I see Intelligent Design as kind of a movement that's coming from different directions because whereas Dembski is sort of operating from a very top down approach, where he's sort of taking the idea of design and trying to make it rigorous in some way, Behe is actually

looking at problems with trying to explain the cell if one takes as given the backdrop of evolutionary theory about how cells maintain their stability and so forth. So it's, in a sense, he's in the business of re-interpreting, sort of re-explaining certain kinds of phenomena that have already been studied. So he's sort of more on the bottom up side. So it's somewhat -- I mean, yes, but relatively elementary. But I think he does -- he does point to -- to an interesting fact. Namely, that it's been possible to sort of study the biology of cells in a fairly self-contained manner without making commitments one way or the other to evolutionary biology. And irreducible complexity is meant to be some kind of account that sort of, as it were, says, well, look, imagine that the cells are in some sense specially created, right, that they have this sort of special kind of stability to them. So, I mean, that's how I see somebody like Behe. So they're not -- but they're both at relatively early stages, I would say.

Q Okay. Given that these sort of two core principles of Intelligent Design are at their early stages, do you have an opinion about whether Intelligent Design as it's currently comprised should be taught to ninth graders?

A Yes, I do believe it should.

Q Okay. And why is that?

A Well, because I think it does provide a very sort of

interesting, accessible and exciting prospect for thinking about the nature of life. I wouldn't say it should be treated exclusively by any means. And it certainly shouldn't be treated as the dominant view. But I do believe it should be taught. And I think it will actually -- it would actually motivate students to enter into science and to study the nature of life because historically, a lot of the people who ended up as evolutionists kind of started off trying to think about what Intelligent Design might be involved in nature.

Q You refer to earlier forms of creationism. Do you have an opinion about whether the earlier forms of creationism should be taught to high school students?

A I don't think the six day stuff should be taught, or the biblical literalism stuff because I don't think you really see any kind of development there that would warrant it as science. I mean, I do think there one has to sort of draw the distinction you're in a sense getting a kind of view of the nature of life that is pretty much grounded on a sort of dogmatic interpretation of text that is not going to change regardless of what the evidence turns out to be.

Q Have you ever heard the term creation science?

A Yeah, that was kind of the old -- yeah. Back in the '80's, that was kind of used a lot.

Q Okay. And what's your understanding of what creation science is relative to creationism?

A Well, creation science was originally an attempt to sort of -- I mean, I think in light of the Arkansas case, right, it was seen as a way of trying to bring in these biblical principles into the science classroom by making it look as though there were scientific grounds for holding what turned out to be biblical beliefs. And so sometimes fossils would be appealed to, sometimes they would be dismissed out of hand, depending on what kind of suited the purpose of the textbook writer. But there was no real clear evidence of any kind of internal development taking place. It was rather, it seemed like kind of camouflage strategy. I mean, at least that seems to be the final verdict on this.

Q And do you -- to you, Intelligent Design is different than creation science?

A Yes, I think so. I think -- not only do I think it's different, I think also its critics treat it differently. That is to say, including the critics who don't want to see it taught.

Q And in what respects is Intelligent Design different than creation science?

A Well, because you, first of all, Intelligent Design actually more self-consciously draws on these wider traditions of Western thought from natural theology and onward that have been marginalized by Darwin which try to deal with larger questions about the nature of life, and which did have some

kind of, you know, proto-scientific development. Like Paley's argument and so forth, and then tries to put it in a more scientifically rigorous form like Dembski's done with the explanatory filter. And so you do see a development. And you also -- and in the way in which the critics treat it. So when the philosophers are debating with Dembski, they explicitly say, let's put aside his religious assumptions and just deal with his arguments on their face. And the kinds of arguments they give, first of all, it's published in their main peer reviewed journals, in the Glossary of Science in the United States. And he responds there. And it's an argument that, you know, they could be having with anyone, right, who they would normally respect as being scientific and so forth. And Michael Ruse, when he writes, I mean, he's an interesting guy to have watched over the last 20 years since he's writing a book a year on this kind of stuff.

And, you know, the -- you know, the Darwin End Design, a book that came out in 2003, there he quite explicitly, when he discusses Intelligent Design, he makes the connections with the natural theology tradition, he treats it in a very kind of respectful manner, and in fact he says that, you know, these views that these guys are putting forward these days could be easily confused with kind of respectable scientific views. And that's something you wouldn't -- they wouldn't have said 20 years ago about creation science. You

see, so all of that I think is indicating that Intelligent Design is really scientific, and isn't very much reliant anymore in whatever historical connections it's had with religion.

Q If you took Dembski's work away, and you took Behe's work away, and I understand you're not going to do that. But would there then be any distinction between Intelligent Design and creationism?

A Well, there's Meyer where I --

MR. GILLEN: Object to form.

BY MR. ROTHSCHILD, CONTINUING:

Q Let me just finish. I mean, in other words, if you took Behe away and you took Dembski away and they'd never written, and nobody had replaced them, would you have any basis then to say Intelligent Design has developed in a way that constitutes science?

MR. GILLEN: Object to form.

THE WITNESS: Well, let's see. First of all, we haven't talked about Meyer's work which I'm not intimately familiar with. But of course there is that sort of strand there as well. But I take it you're after -- your -- the thrust of your question is that, you know, if you took away these three guys or four guys, or how many, you know, finite number of guys, would there be any Intelligent Design? I actually think -- see, we've so far been discussing this issue of

Intelligent Design as something that is mutually exclusive from evolutionary theory. And I understand that because of the nature of the case we're talking about. But within evolutionary theory, within evolutionary theorists, there has -- there have been tendencies in that direction as well. So it's not like Intelligent Design is something completely alien to people who we would normally consider to be contributors to evolutionary theory. I mean, you actually have people, I cite Theodosius Dobzhansky, for example, who's one of the founders of the Neo-Darwinian synthesis who's a geneticist, who quite obviously took Intelligent Design seriously and didn't think of it as being exclusive of evolution. Right. So -- so -- so the thing is that what would be -- yeah. I mean, there is a sense in which the Intelligent Design movement as it's understood today, you know, as this is kind of American phenomena defined by these guys who made the assumptions in association with the Discovery Institute, I mean, there's a sociological way of defining them. Yeah, maybe that form wouldn't exist. But the general ideas and stuff, I mean, are still lurking there in evolutionary theory. And there is stuff that these people have already developed that could be taken, you see. I mean, so -- I'm sorry. I don't know if that answers your question. But I was trying to sort of --

BY MR. ROTHSCHILD, CONTINUING:

Q I want to go through some of the assertions in your report. If you could turn to page one, you have a section titled at the bottom of the page is evolution fact or theory?
A Uh-huh.
Q And if I understand the text that follows correctly, your view is that evolution is both a fact and a theory; is that fair?
A Yes.
Q Okay. And when you use the word theory for a scientific proposition, do you have a specific definition in mind?
A Yeah. I basically mean an explanatory conception of a range of phenomenon. And also that could serve as the basis for a research program, for an empirical research program.

MR. ROTHSCHILD: I'm going to mark as Fuller Exhibit 2 the Complaint filed in this matter.

(Marked for identification Fuller Deposition Exhibit No. 2)

THE WITNESS: Oh, thanks.

BY MR. ROTHSCHILD, CONTINUING:
Q If you could turn to page seven of the Complaint and look at paragraph 13.
A Yeah.
Q You see in the second line of that paragraph, we have a definition from the National Academy of Science -- Sciences for the word theory?

A Yes.
Q It says in science, a well substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences and tested hypotheses; do you see that?
A Yes.
Q Is that a definition of scientific theory that you're comfortable with?
A Well, I don't think it has to be well-substantiated, and I think it has to provide the basis for a research program. I mean, this is too static a definition.
Q So you don't accept this definition?
A I don't think it's sufficient.
Q Okay. You would add the content that it has to assert -- create the basis for a research program?
A That's correct.
Q And you would remove the word well-substantiated?
A That's right. I don't think that's necessary.
Q Okay. Using your definition of theory, scientific theory, does the theory of evolution qualify?
A Yes.
Q Does the theory of Intelligent Design qualify?
A Yes.
Q Does creationism qualify?
A No, because -- well, not creationism in that six day sense we were talking about earlier. Presumably that's what you mean

because there is no research program generated.
Q What about creation science?
MR. GILLEN: Object to form.
BY MR. ROTHSCHILD, CONTINUING:
Q Does that qualify as --
A No. Not in the -- not in the terms that we were talking about earlier.
Q Okay. Now, if we use the National Academy of Sciences definition, does evolution qualify as a scientific theory?
A Yes.
Q Okay. Does Intelligent Design?
A Probably not.
Q Why not?
A Well, because it's not well-substantiated. And I think that's probably why they define theory this way.
Q Okay.
A Because it sort of is prejudicial -- it's sort of -- it's quite biased toward a theory that's been around for a long time and has been allowed to in fact incorporate lots of facts, laws, inferences and so forth, right? It's very biased towards an established theory.
Q Would you agree that the definition in the National Academy -- that the National Academy of Sciences uses is more rigorous or difficult to satisfy than the definition you use?
A No. I think they're quite -- they're different kinds of

definitions in a way. I don't -- I don't see it as more rigorous necessarily. Let's put it this way. Their definition wouldn't necessarily encourage you to continue doing science.

Q Okay. Would you agree that your definition incorporates scientific propositions that are early in their -- very early in their development, whereas the National Academy of Sciences' definition requires that the concept be much more developed?

A Correct. So by this definition, the only thing that counts as a theory is a developed theory, by the National Academy of Sciences. That strikes me as very strange.

Q If you go to the top of page two -- and let me just -- actually, I'm going to read to you, and I'm sorry, I don't have an extra copy -- or maybe, actually --

MR. GILLEN: Want me to make one?

MR. ROTHSCHILD: No, actually, I may have it. Mark this as 3.

(Marked for identification Fuller Deposition Exhibit No. 3)

BY MR. ROTHSCHILD, CONTINUING:

Q Fulller -- the document I've marked as Fuller Exhibit 3 is a press release issued by the Dover Area School District. And you see at the bottom that there is a statement that the school district is going to read to students in biology

class; do you see that?
A Yes.
Q Okay. And at the bottom of the page the statement states, a theory is defined as a well tested explanation that unifies a broad range of observations. Do you see that?
A Yes.
Q Do you accept that as a proper definition of a scientific theory?
A I think I would replace well tested with testable.
Q Okay. Using your amended definition, is evolution a theory?
A Yes.
Q Is Intelligent Design?
A Yes.
Q Okay. Using the definition without your amendment, is evolution a theory?
A Yes.
Q Okay. Is Intelligent Design?
A I don't know.
Q And is the criteria that calls you to question that the issue of well tested?
A Yes.
Q Okay. Do you -- and you don't have -- you don't know whether Intelligent Design can be characterized as well tested?
A Well, it certainly has been tested, you see. And I think -- and it is testable. But again, it's this issue of the age of

the theory because well tested suggests, you know, it's been around a while, and it's been tested lots of times in lots of different ways. And I don't think that's true, you see. But that's not necessarily any fault of the theory itself, you see.

Q How has Intelligent Design been tested at all?

A Well, I think we were just talking about Dembski, for example, right. And we were talking about these counterexamples to his definition of the explanatory filter. Those counterexamples is a kind of testing at a conceptual level, right, because what he's doing is putting forward a mathematical formalization of a concept, and here a philosopher is coming up with counterexamples showing how it doesn't -- how it doesn't apply. So there's a test, right? Also, I guess in the case of Behe, trying to come up with alternative explanations. You know, so Behe says the only way you can explain the way the cell maintains its stability is through irreducible complexity, and some evolutionists say, no, we've got an alternative explanation. Right. So in a sense, the exclusiveness of the explanation being proposed has been challenged. These are tests, right? I mean, they're -- they're not necessarily tests in the sense of coming up with a fact that shows that something is definitively right and wrong, but then in science, you know, relatively little is actually -- you know, relatively few of

the tests that are undergone in science have that quite specific character saying I've got a fact, it shows that this is right or this is wrong. It's only under very kind of controlled conditions you can normally do that sort of thing. Otherwise, these tests are of a much more indirect kind, where you're providing challenges that you think the theory needs to answer to.

Q Okay. So a couple questions there. Are you aware of any way in which Intelligent Design has been empirically tested?

MR. GILLEN: Objection to form.

THE WITNESS: I'm not. I -- I don't know of any such case.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. You -- I think you're suggesting it has been conceptually tested by the -- has been conceptually tested by the challenges raised by critics?

A Yes, yes.

Q I'm a little troubled by this idea that a concept would attain some scientific pedigree as a tested proposition solely by the fact that opposing scientists have found problems with it. I mean, how does that -- how does that advance a scientific concept if all that happens is the proponents of the idea raise a concept and, you know, a bunch of other scientists demonstrate what's conceptually wrong with it?

A Well, first of all, the fact that they bother doing it at all, and the terms in which they do it is familiar from other things that they are considering in their science, right. So, I mean, this is where people like Dembski and Behe are really making advances over creation science, if you're making that kind of comparison. Namely that they're now being answered in the coin of science. Okay. And in a way, they're being answered in ways that sort of brings their concerns close together to the concerns that are already taking place, you know, in other fields of science. So it seems to me that this is an implicit acknowledgment of bringing them in the scientific ambit. And I don't think we should get too fussy about empirical testing, because as more and more science gets done on computers and other kinds of simulation devices, the idea of there being direct empirical tests of things, you know, is going to be increasingly limited. I think these kinds of things that we're seeing here is going to be much more indicative of the kind of science that's going to happen in the future, where you have alternative computer models that can generate the same sort of phenomena that you can say can only be generated one way. And the design guys like to play around with that. And it seems to me a lot of science is heading in that direction.

Q I mean, see, here's my problem. You know, I can come up with the assertion that all of biological life is made of

Playdough, right?
A Uh-huh.
Q And presumably, you know, some smart scientist could actually, you know, show what's problematic about that assertion, that in fact we know the physical composition of Playdough and, you know, we can break it down chemically, and then when we look at, you know, the Venus flytrap, or a racoon, there's actually almost no similarity in its chemical composition, maybe none. And from the way you're describing it, then I could say, look, they've tested my proposition. I'm science.
A Well, I mean, a lot depends on what you do afterwards. I mean, that's why I think one does have to look -- I mean, it's not like once you become a science, or you're becoming scientific it's a done deal, you're scientific forever. I think one has to see how Dembski and Behe respond to the critics, what do they end up coming up with? Do they come up with more sophisticated accounts of what they're doing, and take the counterexamples into account? Or do they just kind of, you know, entrench themselves and just repeat the same old stuff that other people have already shown to be false? So there is an open question, but this is true of any kind of science, right?
Q So my Playdough example, at the juncture after I've proposed it and some smart chemist has shown how problematic it is, I

can claim I'm science, it just might be two years later, if I haven't advanced the ball, then I'm not science anymore?

A Well, then this is why you have to look at the trajectory. One wants to know what you do as a result of being given this sort of objection. Do you improve your theory of Playdough? Do you start to say, ah-ha, there's this micro-Playdough stuff that really is what's going on, and explains why you saw what you saw, right? And then you have this kind of more sophisticated theory, and which then may itself be challenged. That's the kind of trajectory one has to anticipate here.

Q Okay. And have we seen Behe or Dembski, you know, continue their trajectory? They've -- they're confronted with challenges?

A Well, I mean, I actually think they -- they probably have. As I've pointed out, I'm not expert in these guys' work, so I don't know what they're doing up to the minute. But I do think that what they have run -- what they have begun with is something that is itself a scientific improvement over of the concepts that they may have gotten, you know, from natural theology or something like that. So they've already made the first scientific step. You're right. It's an open question. But my guess is it's going to happen. I mean, I just don't know what's happening at the moment. But I take it that that is the way to go. So if you see these guys being further

debated in the philosophical and scientific literature, right, as they put forward more sophisticated versions of their theories, then they're operating in a scientific manner, even if people continue objecting to them.

MR. ROTHSCHILD: Is lunch here?

MR. GILLEN: Sure.

MR. ROTHSCHILD: All right. Why don't we take a break.

(A brief recess taken at 12:06 p.m.)

MR. ROTHSCHILD: Ready, Bob?

COURT REPORTER: I'm all set, thank you.

BY MR. ROTHSCHILD, CONTINUING:

Q Good afternoon.

A Good afternoon.

Q Steve, when -- this morning when we were talking about what made Intelligent Design in your view a scientific proposition, you said that it satisfied the test of having its research trajectory making more of its claims testable; does that sound accurate?

A Yes.

Q Okay. Dr. Behe's book Darwin's Black Box came out in 1996. And Dr. Dembski's book The Design Inference came out in 1998. What -- is it your testimony that since that time their work has indeed followed this positive trajectory with more of its claims becoming testable?

A Well, I think that Dembski in particular has refined the

explanatory filter thing in light of criticisms. I mean, he still adheres to the notion, but it's a much more, you know, fine grained thing, taking into account some of the -- some of the counterexamples. I mean, it's -- with regard to Behe's work, I think he is trying, but I know that work less familiar, the recent work.

Q Okay. So just with Behe, you can't -- is it fair to say you can't make a claim about whether there has been a positive research trajectory since the publication of Darwin's Black Box?

A Well, there have been articles. I mean, there have been articles. I just have not read them. I mean, some of these articles, where Meyer cites them, for example. But I have not read them, so I'm not --

Q So is the answer you can't testify to the fact that there has been a positive research trajectory?

A I -- I cannot, though I do know there has been more research done since then by him.

Q By Behe?

A Yes.

Q And when you're talking about research, what are you talking about?

A Well, he's trying to -- he's trying to test evolutionary explanations of the cell. I mean, there's a sense in which he kind of -- it strikes me -- again, see, this is the thing,

since I haven't read the pieces, I'm only sort of guessing what I imagine the research strategy is. But I take it that he's basically trying to show that there's a sense in which there are certain kinds of phenomena that evolutionary accounts cannot explain, and so whenever an evolutionary account is purported, he wants to say, well, in fact they can't explain everything and that this other account with irreducible complexity, we'll be able to do that. And so it's a sort of battle of dueling accounts for various natural phenomena to get presented. I take it that's kind of -- and if that is in fact what he's doing, then that would be scientific. But I'm just -- again, I haven't read the articles.

Q So you don't know?

A I don't know. But I do think, you know, I mean, I think it's reasonable to suppose that that's what he's doing, given that he's publishing in the area and so forth.

Q But you're speculating on what the --

A Yes, I'm speculating.

Q Okay. And now going to Dr. Dembski, I think what you're saying is he came up with this concept of the explanatory -- explanatory filter, there's been some criticism of it, he has adjusted his definition; is that fair?

A Yeah, I think that's right. I mean, so he has been continuing along with the same trajectory, trying to take

into account the criticism. I think that that's basically -- and that's not surprising.

Q Okay. And can you explain what he originated with and how it's changed?

A Well, I mean, in terms of what he originated with, I think he originally sort of set up something like a, you might say a menu by which you make the inference that something is design based, and who you've managed to say that it cannot be explained by either strict physical regularity or by chance occurrence. And he listed some conditions one would follow, and then people brought up counterexamples to this. And he has adjusted the theory to be able to deal with those counterexamples. I cannot say whether he's dealt with it sufficiently that he's going to fend off all counterexamples in the future. But he is continuing along the same lines, only a corrected version of it.

Q And does this correction fit your definition of a research trajectory where more of Intelligent Design's claims are made testable?

A Well, yes, in the sense that I think it, you know, it does open up this field to critics in the future to -- because he's still sticking with the same method largely, right, so people are in a sense getting used to the way he operates. And so it should make it easier in the future to criticize him, I would think so.

Q I mean, again, I'm going to come back to this point I think I was trying to make at the -- this afternoon. That you're equating the presence of criticism with testability is that a -- I mean, am I --

A That's --

MR. GILLEN: Object to form.

THE WITNESS: Well, that's -- that's basically correct. Yes. Yes, that's right, because I think -- I want to move away from sort of the stereotyping of testability as somehow coming up with some sort of empirically precise prediction, let's say during an experiment, because, I mean, that's -- that's a kind of classic paradigm case of how we talk about scientific testability, but it's not necessarily representative of all the forms of testability that are used in science.

BY MR. ROTHSCHILD, CONTINUING:

Q Right. And as far as I can tell, the only form of testability that you have identified for these Intelligent Design propositions is the fact that they are susceptible to criticism?

MR. GILLEN: Objection to form.

THE WITNESS: Well, I mean, you make it sound like that's mere. I'm not sure what the spirit is in which you're saying criticism. I mean, first of all, the criticism isn't -- the criticism comes in rather specific form, right?

Namely, coming up with counterexamples or coming up with counter models in the case of Behe, right, which in effect you know, bring forward various kinds of other considerations that need to be taken into account. So it's -- you know, the word criticism shouldn't be reduced to something like carpeting or something, you know, as if, you know, all's they're doing is, you know, treating, you know, just sort of plugging holes. They're in fact engaging with it, right, in ways that forced Behe and Dembski to sort of, you know, rethink -- and to varying degrees, what exactly, you know, how they should proceed after that. So it's not a trivial thing to do.

BY MR. ROTHSCHILD, CONTINUING:

Q Well, and I don't mean to treat it as trivial. But I do -- I'm trying to confirm that in terms of how Behe's and Dembski's work has been rendered testable, the only real life examples of that that you are aware of is that the phenomenon that it's -- they have elicited criticism; is that fair?

A Yes. But, I mean, I'm not sure in the normal run of science what else you'd be looking for given that most scientific claims aren't directly testable in that classic, you know, empirical prediction kind of way that we talk about in philosophy of science 101. Okay. So I'm not sure what the alternative that's in the back of your mind would be to what's happened to them, given the nature of the kinds of

claims they're making. So, yes. But I just don't see this as damning.

Q Okay. Going back to the Dover statement and your report, you write on the -- in first paragraph of page two that the -- you agree with Ken Miller that the Dover statement is less than perspicuous, it seems to conflate theory with opinion. What do you mean by that?

A Well --

(Mr. Gillen exited deposition room at 1:07 p.m.)

MR. ROTHSCHILD: You want to wait until Pat's back?

THE WITNESS: Yeah.

(Mr. Gillen reentered deposition room at 1:07 p.m.)

MR. GILLEN: Thank you. Go ahead.

THE WITNESS: What I was referring to was in the first of these italicized things on the first page, the first italicized paragraph, the biology curriculum is also updated to include the following preliminary statement. That it seemed to, in a way, I mean, because one of the things that Miller was complaining about was the fact that by calling -- Darwin's theory was being called a theory as a -- of somehow to slight it, okay? And I -- and I do think that maybe that was something that was going on when that was happening, when Darwin's theory was described as theory with a capital T. Now, I realize that later on, they then defined theory as a well tested explanation that gives it kind of a little more

significance. But I was agreeing with the fact that the statement did look -- did seem to want to denigrate something by being called a theory, as if being a fact would be the really epistemically significant thing, right?

BY MR. ROTHSCHILD, CONTINUING:

Q And that in fact is not the case? A theory is not going to graduate into a fact, right?

A Right. Exactly, exactly. Exactly. No, I mean -- and I do think there is -- that the tone of the statement is a little confusing. I mean, so I'm agreeing with Miller on that point.

Q Okay. Is there anything about the -- and let me just distinguish here, we have two italicized portions in this document. One is the one paragraph item which is what is included in the biology curriculum.

A Uh-huh.

Q And then the second, four paragraph italicized item is what is actually read to students?

A Uh-huh.

Q Okay. And let's start with the -- the statement read to students, so that's the second italicized item, the four paragraph item.

A Yes.

Q Other than what you just identified about the use of the word theory, is there anything else that you find problematic

about the statement read to the students?

A I mean, there's some minor things. I mean -- I mean, so for example, this statement does seem to presuppose that the only kind of testing that occurs is direct empirical testing, right? I mean, at least that's how I read the first sentence of the second paragraph, because Darwin's theory is a theory -- continues to be tested as new evidence is discovered, as if like some fact was going to sort this issue out, which I don't think is -- certainly wouldn't be the case with these theories at this level of generality, though the testing happening at many different levels. Some of them of the conceptual kind we've been talking about with Intelligent Design. Some of them will involve getting new facts. And so a kind of a more nuance notion of testing would have been appreciated, I suppose. And then in the final paragraph, the fourth paragraph, and maybe this is just something that they have to say because they're a school district, but the business of what the point of the science class is, to achieve proficiency on standard based assessments, it's kind of a bit of a downbeat to end this thing, because I would have thought that what you'd want to do is actually encourage students, you know, to find science fascinating, or interesting, or pursue it or something of that kind. And given they're going through the trouble of trying to expose students to all of these different approaches, you could have

thought they could have said that that was the reason they were doing it.

Q Oh, my, you've been away from the United States too long. In this section about evolution being fact or theory, in the second full paragraph, which begins, evolution names both a fact and a theory, going to the bottom of that paragraph, you say, when Miller and Robert Pennock seized upon ID aspirations to change the ground rules of science in their expert reports, they have caught sight of these more fundamental differences in orientation. What did you mean by that?

A Well, I think the -- the sort of the range of phenomena in evidence and explanatory thrust of ID and Neo-Darwinism are somewhat different. So in a sense, I think it's a bit misleading to say that they are competing -- that they're -- that they're literally competing to explain all the same phenomena. I mean, there's a sense in which they're sort of approaching overlapping -- they're approaching roughly the same stuff, but with sort of different conceptions of what's an appropriate way of going about studying it, largely because they are somewhat -- there's a sense in which they're different conceptions of how science is to be understood in general between the two. I mean, I do think it's fair to say that the Intelligent Design people in a sense are aspiring to a kind of an ultimate science of intelligence you might say.

And this is where our information theory and all this stuff, and the explanatory filter as a potentially universalizable conception that can be applied across all disciplines, not just to biology, becomes very important.

And that idea of using the concept of intelligence as a covering device for all science is obviously not -- is not presumed or considered necessary by Neo-Darwinism, which, you know, is operating on a somewhat different level with these matters, and quite focused on the nature of life, the nature of life on earth in fact. And the other thing, too, about Intelligent Design, it's not necessarily kind of just located on earth. I mean, it's -- potentially, the cosmos is its purview. So, I mean, so there's a sense in which these theories are really aspiring to do somewhat different things, but are obviously overlapping in the phenomena of the nature of life and so forth. So they have a lot of common ground in terms of what they need to explain, but their approaches are really quite different. I mean, the fact for -- I mean, if you think about the development of theory within evolutionary biology, this idea of mathematically specifying, you know, the probability of something is something that happens relatively late in the development of evolutionary biology, whereas this is the kind of like the first move Dembski makes, right? So it gives you a sense of a different kind of take on how one goes about explaining things.

Also the, you know, it's also showing the different trainings of the people who are involved in these fields. You know, Dembski's a mathematician, and Behe's a biochemist. I mean, that -- that -- that's -- you know, from the history of Darwinism, those are rather exotic origins for people to have come from to be interested in the nature of life. So there are all these kinds of differences, right, that give different orientations as to what science is about. And so that would obviously involve changing the ground rules of science because there's a sense in which you would change the scope of what you're talking about, because if what you're really concerned about is the nature of Intelligent Design as such, with life being one example of that, as opposed to being interested in the nature of life regardless of whether it's Intelligent Design or not, right, you're going to have different ways of pursuing the inquiry.

Q Okay. So you -- you agree that Intelligent Design aspires to change the ground rules of science?

A Yeah, I think that's fair to say. I think -- I think they certainly -- yes.

Q Okay. And -- and what are the grounds rules of science that you're talking about?

A Well, I'm using their expression. I didn't invent this expression. This is Miller and --

Q Right. But then you agreed, so now I get to ask you.

A Yeah. I understand. No, no, no. No. But I -- I understand the way they understand it. Namely, right when -- when people like Pennock, for example, talk about scientists being cre -- committed to methodological naturalism, right, and some of these very fundamental notions which are in a sense, perhaps, as it were, accurate as a kind of dominant views of what's taking place in professional sciences today, right, it's quite clear that Intelligent Design is certainly challenging that. Right. So all these kinds of built-in assumptions about how disciplines are divided up, for example, so that in principle, Intelligent Design theory is a theory that would, I think, unify certain branches of physics, perhaps cosmology, with the sorts of areas we normally consider under biology. And so you can find analogous Intelligent Design arguments in cosmology today. I mean, this is why in earlier response to your question about, you know, if you got rid of Behe and Dembski, would there be Intelligent Design? Well, you know, in other places -- other fields, like in physics, there's evidence of similar lines of thinking being pursued there with the anthropic principle of Barrow and Tippler, Paul Davies, all these kinds of guys in physics, it seems to me are sort of barking up the same tree as well. And I think, you know, that would obviously lead to a different conception of science. One where physics and biology aren't so far apart from each other the way they are

today, and where cosmology and evolution are seen much more connected together.

Q Okay. You use the term methodological naturalism. What do you mean by that?

A Well, this is a term that I believe Pennock uses. And this is the idea that in order to do science, right, you have to be committed to a kind of naturalistic world view. That is to say, everything happens in nature according to principles of material causation.

Q And you said that that's the dominant view in science today, correct?

A I -- I think it -- you know, from the standpoint of asking scientists kind of what's your underlying principles, yes. I mean, whether it's necessary for them to continue their work is another matter. But I think it -- you know, it's kind of as we're off the shelf ideology, yeah.

Q Okay. And there's -- the dominant view of scientists practicing science is to limit themselves to the principles of methodological naturalism?

A Yes, I think that's right. I think that's what they think they're doing, I think that's what they think they're doing, yes.

Q Okay. And changing that framework is one of the -- I mean, is that one of the ground rules of science that ID aspires to change?

A Yes, yes. That's right.
Q Okay. And you also -- you used the term in your report metaphysical naturalism?
A Yes.
Q What do you mean by that?
A Well, what methodological naturalism is in practice.
Q And explain what you mean by that.
A Well, I think -- see, naturalism is not an innocent view. Right. I mean, one of the consequences of methodological naturalism is that you sort of presuppose the world has to be a certain way in order for science to take place. So you restrict yourself to certain kinds of, you know, phenomena and ways of looking at the phenomena and close yourself off to other possibilities. So you close yourself off to Intelligent Design. And in the past, this kind of naturalism closed people off to looking at things like action at a distance with regard to gravitation attraction in Newtonian mechanics. And in -- even arguably, people say that if you really took this kind of methodological naturalism seriously, you wouldn't be able to make much sense of quantum mechanics as it currently is being made sense of, because that in a sense spends at least certain kinds of common sensical notions of physical causation that are normally seen as rooted in methodological naturalism. So in that sense, there's a kind of metaphysics that's associated with it. It

closes you off to appreciating certain kinds of phenomena. So in a sense, calling it methodological is a bit coy. That's what I would say. I'm using the term because that's the term Pennock, I believe, introduces. I myself would see naturalism as a metaphysical position.

Q So to you, methodological naturalism and metaphysical naturalism or philosophical naturalism aren't really distinct --

A That's right.

Q -- concepts?

A That's correct.

Q At -- certainly at the end of your report, and I think elsewhere, you say that ID rejects naturalism and is committed to supernaturalism, right?

A Well, I think if you're going to take that kind of distinction seriously, because I mean, the point I made about the naturalism/supernatural distinction is that it's a distinction created by naturalists, right, who in effect -- who in effect say, look, these people aren't just considering sort of the normal material world in which things operate, but they also think there's this other stuff out there, Intelligent Design or spirits or something like this. And -- and so that's the supernatural realm. I think actually my view about what Intelligent Design people are doing is actually kind of blurring the boundary more. So in other

words, I don't think it's so -- you know. I don't think, you know, you can't -- I don't really know if there's a moment in Intelligent Design work where you say, ah, you know, you're now entering the supernatural here. You now need a supernatural explanation. I mean, that's kind of more a term a critic would use of it.

Q Well, let me -- when --

A So is Intelligent Design supernatural? Right? I mean -- I mean, certainly when the arguments are being conducted about it, you know, let's say to Dembski's version, the word supernatural doesn't have to arise, but it's quite clear the kinds of inferences he's making do take us beyond what normally is accepted within naturalistic forms of science.

Q When we talk about Intelligent Design, do you understand Intelligent Design to take a position on who the intelligent designer is?

A Not necessarily, though, I mean, historically, of course, a certain kind of monotheistic conception of God has been behind it. But I don't think the way the theories have been developed recently you'd really require any kind of view on this matter, that one could be agnostic. Yeah.

Q Okay. And do you have an understanding of whether Intelligent Design takes a position on what the capabilities or powers of the Intelligent Design is -- designer is?

A Well, this is, again, I don't think there's any kind of --

MR. GILLEN: Object to form.

THE WITNESS: I don't think there's any kind of uniform view on this matter. And in that respect, it's very much led -- I mean, this respect -- you know. There's a sense in which, look, the intelligent designer in a sense has to be intelligent enough to produce, you know, a cell, let's say, that has some kind of organic -- you know, stability over many different environmental changes. So it has to be that powerful or that intelligent. But does it have -- but it doesn't have to be infinitely powerful or intelligent. So in that respect, it is not committed to the fully robust notions of the divine creator that have been associated with the Judeo-Christian tradition. Right. You could actually -- it's quite compatible with a much more restricted sense of intelligent designer.

BY MR. ROTHSCHILD, CONTINUING:

Q Do you understand the intelligent designer, its proponents to have provided any description of what capabilities the intelligent designer has or would need to have to do the things that they say it has done?

MR. GILLEN: Object to form.

THE WITNESS: Well, it all depends how you -- I mean, look. There's a sense in which -- one of the reasons why Intelligent Design has been able to be critically discussed by other scientists and philosophers has been because they

have managed to characterize their theory in a way that doesn't make sense to the properties of the intelligent designer. And so as a result as it were, they have contained their own discourse so as not to go into that direction, which would normally be seen as a sort of positive benefit of scientific, rigorous, methodological direction. I mean, it's something that they should be -- they -- they -- should be regarded positively, the fact that they don't have to go into a discussion of God in order to be able to talk about what their position is and get criticized for it. But I do think where you see evidence as it were of what the intelligent designer is about is when one starts talking about constraints, right, the whole idea of, you know, you might say what -- you know, the -- the limits of the mind of God are -- are as it were the probability constraints within which the explanatory filter can occurs in Dembski. Okay. That would be one way of talking about the parameters of the mind of God if you will. But you don't need to talk about mind or God to actually have a decent argument about this topic.

BY MR. ROTHSCHILD, CONTINUING:

Q But isn't -- isn't the -- how can you talk about the probability that's entailed in the explanatory filter if you have no information about what kind of designer you're talking about?

A Well, because, right, the presupposition of the model is that there is a kind of universal conception of design that applies not just to God but applies to us when we design things. And we know kind of what we're like. Right? And so that's kind of as it were the empirical baseline to operate from. But it's what's presupposed is a kind of universalizable conception of designer that isn't -- that doesn't just rely on God. Okay. I mean that we too have this.

Q But do you understand Dembski's explanatory filter to build its probabilities from the probabilities that humans could design?

A I think that's -- I think that -- that, in a sense, that is part of the initial intuitions, I think, come from that. Just like very much with Paley.

Q But does his explanatory filter base its probability -- its determination of the probability of Intelligent Design of biological life on the capabilities of Intelligent Design that we know to exist in humans?

MR. GILLEN: Object to form.

THE WITNESS: Well, I think -- I think the literal answer to your question is probably yes if -- if Dembski actually went around explaining biological life which, of course, as we were already discussing earlier, he hasn't really done that. Okay. I mean, he -- he's kind of coy on

that issue. But I take it that that would in fact be the way to go.

BY MR. ROTHSCHILD, CONTINUING:

Q Has Intelligent Design succeeded in changing the ground rules of science?

A Well, if you mean this in a statistical sense like are more scientists now inclined to believe Intelligent Design than not believe it, the answer is no, of course. But I do think they have shifted the burden of proof a bit and in terms of making people more open-minded. And I think also providing an entree for -- I mean, I'll give you an example what I think they've done. When Michael Ruse wrote that book, Darwin and Design, I think that was the first of his books where he starts talking about complexity theory and the kind of computer modeling of self-organizing phenomena that was often presented as a kind of potential criticism of evolutionary theory. All the stuff being done in the Santa Fe Institute by Stuart Kauffman, people like that.

And the way Ruse presents it is basically, look, the Intelligent Design people have a very extreme version of this idea. And so -- and so in a way to immunize yourself against what Intelligent Design might come up about, you should take complexity theory seriously. Okay. So in a sense what he's -- what they've done indirectly is kind of opened the door to cognate points of view that are more respectable but

in the past really haven't been considered very close to evolutionary theory. So they have done a little bit of shifting around. I think they've also made the business of doing computer simulations more interesting for biological research. But again, you know, I'm not going to say these are like deep determining effects. But on the margins, I think they've had some influence in the way in which people are conceptualizing how evolutionary biology needs to be assessed.

Q So it's your understanding that Stuart Kauffman's work on complexity theory arose in any way in response to Intelligent Design?

A No. But from similar concerns that natural selection can't explain changes in the nature of life, right. And he's someone who believes that there are mathematically specifiable parameters, right, which are necessary in order for any kind of life to get off the ground even before natural selection gets on the scene. Now, insofar as he holds that assumption, that assumption is very similar to the assumption of Intelligent Design people. Of course, he takes it in a different direction, he doesn't really talk about God. But I can tell you this. I mean, people who are very die-hard natural selection people like Daniel Dennett, you know, true -- you know, sort of true believer Darwinists, they're very scared of Stuart Kauffman for actually giving

the impression that something like -- like, you know, Intelligent Design might -- might be able to have some repro-shmault with evolutionary theory.

Q Did you agree that Intelligent Design involves consideration of supernatural actors?

A It certainly allows the possibility. They don't actually tell you much detail about them, so it's not like they have some great theory of the supernatural.

Q Right. But the intelligent designer they're talking about is not being represented as a creature known to us in the natural world, correct?

MR. GILLEN: Object to form.

THE WITNESS: Yeah, insofar as it's discussed openly, that's correct, I think.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. In Pennock's report, he states that there's no evidence in the scientific literature that supernatural hypotheses are being considered, and it's hard to imagine how that could possibly change without undermining the very notion of empirical evidence. Do you agree with that statement?

A No. I mean, because I think it's based on a -- on a sort of a leading definition of what supernatural -- I mean, because it -- there are some people who will say that a lot of aspects of quantum phenomena have supernatural qualities to

it if we kind of understand natural to be common sensical forms of physical causation, for example. I mean, so there's an issue about what -- where the boundary's being drawn here. And insofar as there's still research on things like paranormal phenomena, which do involve experiments and about things that because they involve some kind of action at a distance, where the physical causation is not by any means clear, but you're nevertheless doing experiments on this stuff, you know, it's supernatural and it doesn't undermine the empirical foundations of science.

Q Okay. So you think there is scientific research being done --

A On things that --

Q -- supernatural hypotheses?

A On what one could reasonably call supernatural. Certainly there's experiments being done on the paranormal, yeah. And in the past, of course, supernatural entities have been entertained within science.

Q In what past?

A Well, for example, if you look at Newton's theory of gravitation, okay, which -- action at a distance. That was originally -- I mean, the word that was used was occult. It was an occult entity because, you know, how could this thing happen? All that -- all that Newton had, kind of a bit like Dembski, was a kind of mathematical equation that actually

did make some sense of phenomena. And then people said, well, what could this be? Newton says that things are being pulled by some mysterious fashion. When in fact we all know that in the material world, motion happens through contact between objects. And here's Newton saying the exact opposite's happening. How could this be? Well, it took a long time to sort of figure out. And I'll say this. The supernatural hypothesis kept going for a while, and then it got naturalized, right. So now we talk about gravitation without worrying about action at a distance as somehow disturbing our notions of nature. But the super -- but having this kind of occult thing was really quite important for motivating research -- research and physics for, you know, a good 100, 150 years. So, I mean, it's -- there's -- see, the point is being supernatural and dealing with -- and being scientific are somewhat separate issues. And a lot has to do with how you test -- how you deal with the hypotheses of being proposed as supernatural. It doesn't have to do with the content of it as supernatural per se. So you can deal with the paranormal in a completely spooky fashion, and say, oh, I just believe it no matter what happens, or you can deal with it scientifically by trying to design experiments that might actually try to show it exists.

Q Okay. And you say in your report that ID proponents believe precisely that specific supernatural explanations are

testable?
A Yes. That's the point, yes.
Q Okay. But you have not been able to identify any experiments that they do or have proposed, correct?
MR. GILLEN: Objection.
THE WITNESS: No, they haven't done -- not in the strict sense, no. They have made various plausibility arguments and, you know, as it were, you know, you might say, proto pre-experiments, you know, that kind of thing. Thought experiments perhaps you might call them. But, no, they haven't done experiments in the sense that we do experiments on paranormal phenomena where the people can guess what the cards are and things like that. No, they haven't done anything like that.
BY MR. ROTHSCHILD, CONTINUING:
Q Okay. And you say right after that in your report that ID proponents also wish to draw corroborating testimony from the viable but crucially this forms a diminishing proportion of ID's argumentative arsenal. Taking the first piece of that, what are you talking about when you say that ID proponents wish to draw corroborating testimony from the Bible?
A Well, again, I think of people like Phillip Johnson who periodically will kind of make allusions, usually kind of just almost like an emotional appeal. I mean, not really in a way that you would call evidential appeal, but kind of an

emotional appeal about the righteousness of this kind of stuff. So there is that. I mean, and insofar -- I mean, he is -- he has been very supportive of the Intelligent Design movement so I wanted to, as it were, acknowledge that that does exist.

Q Do you understand Dembski to be doing anything similar?

A I believe Dembski has written some pieces which do have this character, but they're not the piece -- but they're somewhat separate in terms of where they're located. So maybe something -- maybe something that was even on the website of the Discovery Institute that he published may have a bit of this flavor to it. But not the stuff that I've ever seen him in the more professional publications.

Q And why do you say it performs a diminishing proportion of ID's argumentative arsenal?

A Well, you just don't see it in writing -- you just don't see it anymore. I mean, you don't see any appeals to the Bible. You would never -- I mean, in fact, unless you knew the history of all this, you'd never guess by the way this stuff is being argued today that the Bible played any role at all.

Q Do you have any concern that that absence of religious reference so to speak is tactical rather than scientific?

A Well, if it lasts long enough, it becomes substantive, right. I mean, because at the very least, even if it is tactical and that the only places they're discussing religion is somewhere

else, not in the classroom, not in their textbooks, not in the public forum but in Sunday school or something like that, after a while what that does is it institutionalizes a sharp distinction between religion and science, like it or not.

Q If it was the objective of the individuals who are developing Intelligent Design to come up with a religious science, or a science that comports with their religious convictions, would that be problematic for you in terms of judging whether there is a -- truly a scientific program going on?

A No, because science at the end of the day has to be with testability. People can have whatever religious motives they want. Okay. And in the philosophy of science, I mean, in connection with the demarcation problem, we make a distinction. It's an old distinction but it's a valid one in this context. The context of discovery versus context of justification. If you look at the -- the context of discovery has to do with the motivation that people have for coming up with various scientific hypotheses. And as we note through history, especially the history of the west, religion has played a very important role consistently. Various religious beliefs. Because, you know, Christianity comes in many flavors, and Judaism, and Islam and all this. And people have been motivated in different ways, depending on where they're coming from on the religious map. But at the end of the day, what makes it science is the context of

justification which has to do with how you test a theory, right? Do you do it by these publicly, methodologically accessible criteria? Do you refine your -- your theory in response to criticism over time regardless of where the criticism's coming from, so you hold different religious beliefs than me, I do an experiment, you criticize my experiment, I don't ask what your religious beliefs are. I just change my -- my theory so that I avoid your criticism. Okay. And that's how it becomes science, is once it moves into the context of justification. So the fact that these people have all these religious beliefs doesn't bother me at all. What I look for is whether they treat these beliefs scientifically in terms of submitting them to sort of the rigorous, methodological tests. And so that's the key thing. So the fact that people who don't share Dembski's or Behe's beliefs are criticizing them in a way that they would criticize other scientific colleagues is, for me, a very good sign. And I don't care how religious they are, when -- you know. But in -- in -- in -- in -- in the court of criticism, everybody's equal. And that's what makes it scientific.

Q Do you draw a distinction between the fact that some of the scientists are very religious, which is true of many evolutionary --

A Yeah.

Q Evolutionary scientists as well and professions that they are

attempting to develop science that is consistent with their religious beliefs. I mean, is that significant to you?

A I'm trying to get a grip on the question here. Let me see. Can you rephrase it a little bit?

Q Well, one can imagine that there are scientists who are extremely religious, but the only way you would know that that's so is you would go to their place of worship.

A Yes, yes. Yes.

Q And then there might be scientists who say, I want to develop science that comports with my religious belief. That's my objective, that's why I'm doing this. Does -- if a scientist fell in that second category, is that significant to you in terms of judging the merits of the scientific enterprise?

A I understand. The answer is how that second scientist goes about trying to get a science that conforms to his religious beliefs, because if the way he does it is through dogmatism, you know, and forcing people, you know, to read certain textbooks and so forth, indoctrination, cultishness, if that's the way he does it, okay, then it's bad news, it's not -- it's not science. But if the way he does it is, you know, is say, look, you know, I -- you know, I believe in the science and I want you to believe in the science because I believe in this conception of God, but the way -- but I want you to test this, can you do this experiment yourself? Will you come up with these results? See, if you look at somebody

like Sir Isacc Newton, for example, and he's writing in a period where it -- you know, people are still quite open about talking about their religion and science in the same sentence, he makes it very clear what kind of God he believes in. But at the same time, he's also got a mathematically specifiable theory that you can test for yourself as it were, and -- and you -- and -- and -- and you can buy it or not buy it, and you can do so without accepting whatever heavy religious thing he laces the theory with in its pages. And that's -- so at the end of day for me it's how you proceed, how you proceed to develop the theory. You can -- you could state your religious beliefs as loudly as you want. But -- but as long as you're testing them in ways that don't require that you hold those beliefs. See, that's the thing. The testing of the beliefs have to require an independence of mind. But the fact that the people who are putting forward the hypothesis to test happen to have very strong religious beliefs that they actually announce, that itself should not be a problem.

Q In terms of -- I think what I understand you to be saying is that religious affiliation, even religious motivation is not significant if the scientist goes about their enterprise in a religiously neutral way; is that fair?

A Yes.

Q And one significant way you have identified for doing that is

to develop the proposition in a way that it can be tested?
A Yes.
Q And then test it?
A Yes.
Q Is another indicia of that independent or religiously neutral scientific enterprise that the proponents of it submit their propositions to the scientific community?
MR. GILLEN: Object to form.
THE WITNESS: Yes, yes. But, again, are you -- I mean, in a sense, I almost take this to be a restatement of the first point. But -- but you want to draw a distinction here?
BY MR. ROTHSCHILD, CONTINUING:
Q Well, I mean, let me -- I'll -- I'll -- I'll give an example of it. Would it -- would you consider it an indicia of this sort of religiously neutral, independent scientific enterprise that the individuals developing the science submit their propositions to scientific -- peer reviewed scientific journals?
MR. GILLEN: Object to form.
THE WITNESS: It depends. The issue is easier to solve if these people are doing normal science, because then, as it were, the relevant peers are clearly identified, right, because they're working within a form of science that already has well defined boundaries and they're trying to make a contribution to that. And so, therefore, as it were, the

relevant critical community is co-extensive with the peer review process. However, if what you're trying to do is change the ground rules of science, then it's not clear. I mean, peer review has a much more ambiguous role, especially given the types of deformations that the peer review is subject to, whereby there's a kind of resistance to new things. And so, you see, when people like -- when the Intelligent Design people look like they're avoiding peer review process, I think there's a genuine problem about exactly who is the relevant form for judging these things, right? And I'm not saying that necessarily plays to their benefit either because there is an open question if you cannot figure out who can test this thing, then is it really testable? Fair question. But interestingly enough the stuff is being tested, and at least by the philosophers, right? So there's a -- at a certain conceptual level, right, there are people who are registering that there is something there, because after all, Dembski's book was -- was criticized severely and he responded to it in the leading peer reviewed journal, in the Philosophy of Science. Now, probably Dembski thinks, you know, he has bigger fish to fry than philosophers of science. But the point is that, you know, that's a peer reviewed publication of a recognized professional society where his arguments were taken very seriously. Okay. So he did find a peer review outlet for this, okay? So it's not

like these guys can't find any peer reviewed things. But I do think there is a kind of difficulty there in knowing exactly who is eligible to test what you're saying.

BY MR. ROTHSCHILD, CONTINUING:

Q Would you at least expect that -- well, let's take an example like Professor Behe's work, that is dealing at it -- you know, as you said, sort of bottom up?

A Yes.

Q With the structure of the cell.

A Yes.

Q And making certain -- drawing certain conclusions or inferences from the structure of the cell, is that fair?

A Yes.

Q And that's -- falls within the field of molecular biology?

A Yes.

Q Okay. Would you expect that -- that that kind of work would then belong -- should be submitted to journals dealing with molecular biology?

A Yes. But -- okay. Here's the issue. First of all, some of the work has been submitted, not very much. And the response to it is again the problem of when you're trying to do something different because I think the tenor of most of the responses to Behe has been along the lines of we really need irreducible complexity, we've got our own ways of explaining what's going on with the cell. So thank you very much,

right? And that's not surprising because Behe is trying to kind of come up with an alternative science. And peer review processes are designed for promoting normal sciences that are already on the ground. So not surprisingly they're going to say, look, we can -- we can explain what you're talking about, we don't need your competing explanation. That doesn't mean his explanation is false. It just means that from the standpoint of the way in which normal science is conducted, it's not very useful.

But if he wants to come up with an alternative science -- which is presumably what he wants to do in a sense -- then he -- you know, he's got to launch his own research program. I mean, and that's where it becomes important to have a clear sense of what these guys' research program is, where are they going with this. Because otherwise, then you would just say, oh, it's just parasitic on what evolutionists are doing, which is a critique you often get in Intelligent Design. But if you can show that these people have a positive research program, they're pursuing their own research, going in their own direction, the fact that it can't get published in peer review journals in molecular biology as it's traditionally understood is not itself a problem.

Q Okay. But right now as you understand it, there is neither a robust record of peer reviewed publications, nor a robust

research program?

MR. GILLEN: Object to form.

BY MR. ROTHSCHILD, CONTINUING:

Q Is that fair?

A I think the research program is in its early stages. Okay. I mean, that's a little different than robust.

Q Okay.

A And I think, yes, the peer review record is not robust. I think nobody would deny that. I don't think they deny it either.

Q And in the case of a research program, I mean, you can't identify any empirical research that's being done using irreducible complexity or using the explanatory filter, correct?

A Well, I mean, the theories are being developed, right? I mean, Dembski has been making his refinements and I think Behe has been doing research, but I'm just not -- I don't have firsthand familiarity with it.

Q And here's what -- you know, Steve, what I'm troubled with is that I think it's the case that -- I think you would agree with me that you would characterize Intelligent Design as in its relative infancy; that there's some people doing some thinking about it, thinking hard about it, they've come up with some ideas, and that it really hasn't moved much beyond that. It might, but right now it hasn't; is that fair?

A Well, I mean, it depends how fast you think things ought to take. I mean, you know, the time it took to go from Darwins' Origin of the Species, to the Neo-Darwinian snythesis, right, was from 1860 to let's say 1930, 1940, with a quarter of a century in the middle where people thought Darwinism was dead when genetics first came up. Okay. That's the history of Darwinism for the first half of its life. Okay. I mean, you know, if that's the benchmark, then you see, then I think we ought to be a bit lenient about Intelligent Design.

Q And what -- I raise the point, Steve, not because it -- I'm trying to assert something about what Intelligent Design might become long after, you know, we've, you know, gone to dust. What I'm -- what I'm raising the question is given its primitive condition, why would you -- why would it be taught to ninth graders?

MR. GILLEN: Object to form.

THE WITNESS: Well, precisely for this reason. Namely, we're talking about how to take science forward in the future. And it seems to me that we sort of betray kind of the open-mindedness that we take to be -- you know, we take science to exemplify as a hallmark of our civilization if we don't -- you know, if we don't present students with the possibility that science is something that's still very open for very fundamental forms of inquiry. And the best way to do that is to show how one might study something like life

starting with fundamentally different assumptions from the taken for granted view, because otherwise we're stuck with just teaching dogma science. It's sort of defeating the whole kind of open -- openness of science, what makes it such an exciting and important field. I would have thought from a pedological standpoint you would want to expose people to kind of new views that haven't been fully explored yet because it gives something for them to do that's kind of exciting, rather than just filling in the puzzle of something that's already been established for several generations.

BY MR. ROTHSCHILD, CONTINUING:

Q Now, you've read the statement that they're going to read to the Dover students, right?

A Uh-huh. Yes.

Q Okay. And --

A Well, look at the fourth paragraph, right?

Q Right. Okay. I want you to look at the text right below the statement.

A Okay.

Q And it says, the Superintendent, Dr. Richard Nilsen, has directed that no teacher will teach Intelligent Design, creationism, or present his or her or the board's religious beliefs, right?

A Uh-huh. Yes.

Q How is the objective you just discussed accomplished if

students are simply being told here's Intelligent Design, but then they're not allowed to discuss it?

A I didn't -- well, I'm endorsing this view. I'm not responsible for this view. I don't -- at least as far as I understand, I don't endorse this.

Q Okay. You -- so you -- the Dover policy of simply making students -- of telling students about Intelligent Design but then not allowing them -- allowing the teacher to talk about it doesn't accomplish the objective?

A It defeats the purpose, yes. That's true. Yes.

MR. ROTHSCHILD: Okay. I'd like to mark as Fuller Exhibit 4 -- let's see if I have a stapled version.

(Marked for identification Fuller Deposition Exhibit No. 4)

BY MR. ROTHSCHILD, CONTINUING:

Q Do you recognize the document I've marked as Exhibit 4?

A Yes, I do.

Q And what is that?

A It is a report I wrote following a global cyberconference I did on public understanding of science, I believe it was 1998. Yes.

Q Okay. And is this project you're describing in this article sort of representative of the work you do in social epistemology?

A It's a kind of applied side of it you might say, yes, because

it tries to bring different people together and so forth.
Q Okay. And if you go to the second page of the document which is page 330 of the article, there's a section entitled intellectual motivation for the cyberconference; do you see that?
A Yes.
Q Okay. And I take it the point of this conference is to discuss public understanding of science?
A Yes.
Q Okay. And towards the bottom of the first paragraph of that section, this concept with the acronym PUS?
A Yes.
Q Is --
A That's public understanding of science.
Q Yes. Stated can be understood as symptomatic of a crisis in scientific representation, akin to subjects of a monarch who wish to be regarded as citizens of a nation, but have yet to identify an effective political vehicle for its realization. Can you explain what you're trying to convey there?
A Okay. Well, the idea being that in the modern period at least, science has had a kind of uni -- sort of unilateral, maybe monolithic authority over, well, political opinion and -- and in all kinds of other respects, and in a sense, is supposed to stand for all of society in terms of, you know, for example, providing food, health, safety standards, things

of that kind. We call in scientists actually to sort this stuff out for us. People are not -- the people who are governed by these scientifically derived rules are not normally consulted or involved in the process. And this kind of issue starts to become more and more important as people perceive that there are more and more scientifically generated threats and hazards in the society. And in a sense, they want to get involved participating in decision making concerning science and so forth. And so in that sense, they want to behave more like citizens of a nation rather than, you know, being under a monarch, where science is the monarch in this case.

Q Okay. And, you know, you use the phrase science is the monarch. Who's science?

A Well, I'm talking about like the National Academcy of Science. Right. So we're not talking about all rank and file scientists, because in fact depending on where you are institutionally in science, you hold different types of viewpoints, okay, about how science should be used and so forth. But I'm talking about the sort of the people, the main disciplinary people. Right. The people who run the professional societies, who run the National Academy of Sciences, which tend to keep a kind of monolithic view of what science is about.

Q Are there risky alternatives, and I'll raise one example.

You know, we talked about global warming. And, you know, for example, we see in the present American presidental administration that scientists come to gather data and come to conclusions about the state of global warming, and then we're led to understand by some quarters that political considerations, you know, effectively suppress that scientific information. I mean, is that -- isn't that the risk of the alternative you're suggesting?

A I mean, I think what you're saying is true. But that doesn't mean that therefore there's global warming, okay? I mean, I think what we do lack is a sort of -- a general and full, open discussion. So you're right, I'm not going to deny that there has been the supression of scientific information. But just making the scientific information known doesn't necessarily resolve the issue. So there's a sense in which one needs to think about what is the appropriate forum in which these different opinions concerning global warming should be articulated and discussed, and then decisions taken. I think that's kind of more the issue. It's not like we kind of already know the answer but it's being supressed by politicians.

Q And then if you go to the next page, page 331, you have a discussion of American's discussion of PUS --

A Uh-huh.

Q -- having been more open to matters, being more open

including to the incorporation of religiously inspired doctrines, for example, Intelligent Design theory, a/k/a creationism into mainstream science education. Do you see that?

A Uh-huh, uh-huh.

Q And that's consistent with what you told me today, which is that Intelligent Design theory is a form of creationism?

MR. GILLEN: Object to form.

THE WITNESS: But it's -- no. But it's not all of creationism, and it's in fact the part of creationism that gets taken into science. So, I mean, I mean, obviously, I'm just -- because in the time that this piece was written, right, so this was written in 1998, Intelligent Design theory wasn't that widely used as an expression. So I put the creationism in there so people kind of have a sense of what exactly Intelligent Design is without me having to give a whole song and dance about it, because I'm just using it as an example. But I didn't mean to say that everything about Intelligent Design corresponds to everything about creationism.

BY MR. ROTHSCHILD, CONTINUING:

Q But you -- what do you understand the acronym a/k/a to mean?

A Yeah, also known as.

Q Okay. So --

A Right. But in 1998, okay, we're talking -- you know, when

did Dembski's book come out? 1998? I mean -- right? I mean, we're talking pretty early before this thing becomes really crystalized as something that's separable from all these different branches of creationism.

Q So you're saying in 1998, Intelligent Design was more similar to creationism than it is today?

MR. GILLEN: Objection to form.

THE WITNESS: I'm not actually -- I'm not actually making any commitment to that in this parenthesis. I'm just using it as a marker so that people can understand what Intelligent Design -- since Intelligent Design theory was an ascendant notion, what exactly -- how -- you know, in what conceptual space one should put that when thinking about what religiously inspired doctrines mean.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. And Intelligent Design -- you were characterizing Intelligent Design theory as a religiously inspired doctrine?

A Well, it is, and to a certain extent is religiously inspired. But to be religiously inspired is not to be religion.

Q Okay. And -- and you were equating it with creationism?

MR. GILLEN: Object to form.

THE WITNESS: I wasn't equating it. I wasn't equating it. All right. I mean, I was just -- I was using it as a kind of -- as a placeholder for it in a period where this term Intelligent Design wasn't yet consolidated in the way it

is now. Had I written this thing today, I would not put it this way. I mean, these things are time sensitive. In that respect, Intelligent Design has made progress fairly rapidly, because in the course of whatever this is, seven years since this piece has been published, right, the status of this thing has changed somewhat.

BY MR. ROTHSCHILD, CONTINUING:

Q And in what respect?

A Well, in the sense that I think it's more easily disentangleable. So like even when you were talking about Intelligent Design theory, you were able to nail it down to a few people, right, who are in a way separable from the general creation movement. And I think that -- you know. And I think that that's because of all the, you know, not just the publication of the books, but also the way in which the discussion of Intelligent Design has kind of moved off in its own space. So in a sense, you can talk all about Intelligent Design now without bringing in all the other schools of creationism, or the six -- you know, the six day stuff or any of that.

Q But that was not true in 1998?

MR. GILLEN: Object to form.

THE WITNESS: I think in 1998 these things were much more confused.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. Confused by who?
A Well, I just mean just generally speaking.
Q You for one?
A Look, I didn't say I was a creationist or Intelligent Design theorist. But I do think that -- I do -- I do find -- I have found out more about it in the interim, I think it's fair to say that I knew less about it back then. Largely because there was less of it to know, okay. And I know more about it now. But again, this is seven years ago.
Q Okay. Now, when I asked you about this before, you said you'd been following this issue?
A Not -- I mean, but I never said I was an expert on this. I said I was following it, you know, kind of shadowing it. That doesn't mean I'm an expert on it.
Q I mean, you know, these -- Steve, words are pretty hard to escape. Religiously inspired doctrine a/k/a creationism. And I think -- what I'm trying to understand is, you know, what about Intelligent Design caused you to characterize it -- characterize it as --
A Well, because --
Q -- Creationism at the time?
A Because all of the response -- look. All of the responses to Behe and Dembski and the line of argument that that led -- led from to the present day happened after this. I mean, there is a sense in which, you know, if you want to -- if you

were -- if you ask the question what evidence is there that Intelligent Design is making this transition from metaphysics to science, the fact that, you know, I would never write a statement like that today because things have changed in the seven years. Okay. And I didn't say -- you know. I mean, and maybe I did an injustice to Intelligent Design theory back in 1998 because I hadn't -- you know, I hadn't read Behe's book which was already out. I mean, that's entirely possible. That may well be true.

Q Going to the -- to the back of the document, the second to the last page -- third to the last page, sorry, 339.

A Uh-huh.

Q You have an appendix that lists titles of opening statements. And one of them is telling the difference between science and religion. Do you have a recollection of what that was about?

A Okay. One thing to point out is that these statements, because I've done two global cyberconferences. In the first one, I did not write -- I mean, write the opening statements. I did that in the second one. So I'm not sure who wrote this first opening statement. It may have been John Angus Campbell, it may have been him. I mean, that is one possibility.

Q Okay. Speaking of John Angus Campbell, you had an essay or article that was published in the book he and Stephen Meyer edited called Darwinism, Design and Public Education?

A Yes.
Q Okay. And that book was -- I think it published in 2003?
A Yes.
Q And your article which I'm going to mark as an exhibit was titled, An Intelligent Person's Guide to Intelligent Design Theory?
A Yes.
Q Did you come up with that title?
A Yes, yes, yes.

MR. ROTHSCHILD: Let's mark that as the next exhibit.

(Marked for identification Fuller Deposition Exhibit No. 5)

BY MR. ROTHSCHILD, CONTINUING:
Q Was this article published in any other forum before it was --
A Yes.
Q -- part of the book?
A Yes. In fact, it was originally published in Rhetoric and Public Affairs, which is a peer reviewed journal in, I guess, Texas A and M.
Q And do you remember when it was published?
A My vitae would have that, if you'll just give me a moment.
Q Sure.
A Here it is. 1998.
Q Okay.

A Obviously, I was starting to think about Intelligent Design back then.
Q So I take it you had some familiarity with Intelligent Design at the time you wrote the article?
A I guess so, yes.
Q And if you flip to page 536, the second full paragraph you talk about the idea that creationism has inherited Lamarck's charge may seem strange until we consider particular articles in this volume, and you refer to Stephen Meyer and Michael Behe's article. So, I mean, I guess the first thing to clarify is, I'm a little confused about sort of the timing here.
A Were they in the original journal article, you're asking?
Q Yes.
A I think they were because I don't -- I don't actually recall substantially revising this.
Q Okay. So you were, in this article written in 1998, referring to articles by Dr. Meyer and Professor Behe about Intelligent Design that you believe were also written in 1998 or sooner?
A That's right, yes, because there was a special issue of that journal that was basically the launch pad for the volume.
Q Okay. And you say the idea that creation has inherited Lamarck's charge may seem strange until we consider particular articles in this volume, and then you refer to

those two articles. And I'm interpreting that to be labeling Meyer and Behe's articles as examples of creationism, is that fair?

A Yes.

Q Okay. So again, at this time, in your view, you consider Intelligent Design as creationism?

MR. GILLEN: Object to form.

THE WITNESS: I mean, again, it seems to me that I'm using it in this very general kind of way that's not presupposing that all of them hold the same views.

BY MR. ROTHSCHILD, CONTINUING:

Q I'm not suggesting it is. In what sense -- I mean, I understand that you certainly are not suggesting that, for example, this work or Intelligent Design work is, as a general matter, creationist in the sense that it requires belief in a six day creation?

A That's right, or biblical literalism or anything of that kind.

Q Okay.

A No. So it's not that kind of creationism.

Q But clearly, you are indicating that Intelligent Design is creationism in some sense?

MR. GILLEN: Object to form.

THE WITNESS: It is a -- it does have roots in that. I mean, Intelligent Design is a way of interpreting

creationism, that's true.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. And what aspects of -- what do you mean by creationism when you say Intelligent Design does have roots in creationism or is creationist?

MR. GILLEN: Object to form.

THE WITNESS: Well, I mean, the motivation. The motivation for putting forward Intelligent Design is from people who do think that there is a divine creator. I mean, I think historically, that's been the case. And I think it's probably true of these people. But again, what makes it science isn't that fact. I mean, again, all kinds of religious motivations inform science. I mean, so there's nothing, in a sense by calling it creationism what I'm doing is I'm giving something about the motivation of the people but not necessarily about the scientific status of what they're doing. Those are two separate issues. You've got context of discovery, context of justification.

BY MR. ROTHSCHILD, CONTINUING:

Q Okay. And so when you -- when you refer to this Intelligent Design work as creationist, do you -- do you mean it only in the sense that it's motivated by creationist interest?

A Yes.

Q Okay. And not anything about the content of Intelligent Design?

A No, because in fact these people in practice don't actually say much about the qualities of the creator, right. I mean, in that sense, they don't do a lot of the stuff of traditional creationism.

Q They do suggest that the designer is a supernatural creator, correct?

MR. GILLEN: Object to form.

THE WITNESS: Well, I mean, yes. But that's not saying a lot, you see. I mean, I just don't think that's saying very much. I think --

BY MR. ROTHSCHILD, CONTINUING:

Q Do you -- go ahead.

A No, no, no, you go ahead.

Q Do you consider that an aspect of creationism; that a -- that there is a -- that the explanations of life include a supernatural creator?

MR. GILLEN: Object to form.

THE WITNESS: Yes. I think creationism does presuppose that the creator is separate from the creation, in which case it is supernatural. Yes. I mean, so yes. I mean, it's attached to a certain kind of cosmology which does involve a difference between the creator and the created. So it's true, supernatural in that sense. But again, I don't see this as operating in a way that actually, in some way visciates the science that's being done.

BY MR. ROTHSCHILD, CONTINUING:

Q Could you turn to page 538 of the article. In the first full paragraph, you say, my tentative approval notwithstanding, Meyer's view raises its own questions, one theological -- one theological and the other more strictly scientific. You say, is it reasonable or even nonblasphemous to suppose that God is the ultimate artificer? Artificer? And you go on to talk about Meyer's willingness to subvert the significance of the boundary between biological and mechanical forms of intelligence being intellectually bracing. And then it goes on. Can you explain what you're getting at here?

A Well, I mean, in a sense what I'm bringing up is a kind of concern that actually you were bringing up earlier. I see you get your ideas from good places. Namely, this business of just because we can -- even if we can understand how human beings create things, why should we think this is any kind of model for understanding how God does things? And let alone how life is created. So, yes, that's the -- that is the objection I'm raising here.

Q And I think -- I think you understand -- I understand that at one level you're raising that, that that's a theological problem?

A Yes.

Q That we -- it's blasphemous to suggest that, you know, what we know about ourselves and what we can do is in any way a

model for God; is that right?
A Yes, yes.
Q Okay. Is that -- do you also -- are you also suggesting that that argument is scientifically problematic?
A Well, I don't seem to say that here, do I? No, no. The scientific side is a different argument, isn't it, right? Because there's two arguments here, right? There's a theological argument which is what we're talking about, but then there is also a scientific issue.
Q Right, which is separate?
A Yeah.
Q Do you find the first argument which you focus on theologically --
A Yeah.
Q -- also to be scientifically problematic? Because I can't get over it.
A I -- see, my attitude toward this has changed a bit over the last seven years, okay? I mean, I guess I would have said yes back then, that it was problematic. But now I think that there's a sense in which, as so much -- I've mentioned this earlier. So much of science goes on to be done as computer simulations, where the scientists in a sense has to be something an artificer, and that includes when one is trying to model the nature of life and the way in which life develops and so forth, I think it actually becomes easier to

sort of put oneself in the mindset of what a -- of how a creator would create things. So I think it's not as far-fetched now as it was before.

Q And so you've gone to this point a few times, I want to make sure I understand it. Are you suggesting that our ability to intelligently model the development of life in effect demonstrates or puts us in the shoes of a potential supernatural creator?

A I think -- I think it certainly makes it easier to sort of think about what such a creator would do. So if one were approaching projects like Dembski's explanatory filter thing, I mean, I happen to believe that that project of Dembski's will probably at some point be taken out of Intelligent Design proper and it actually be made much more mainstream science as part of a general -- as design become more taken on-board, as we do more and more of our science on computer simulations. I mean, in that respect, I think science is changing, the grounds rules are kind of changing. Not necessarily because people are believing Intelligent Design, what's going on there, but because the way we do science is changing, and that we're doing more of it on computer simulations and that does put us in the position of an artificer more, and to think in terms of what kinds of constraints and parameters, and then, as it were, testing things by the kinds of worlds we produce as a result of

operating with certain constraints and parameters. And that seems to me very much in the spirit of the kind of thing Dembski's doing, and we're doing more and more of our science in computers, which kind of puts you in the mindset to be able to think that way. So I do think that there is -- that it is more plausible now. I mean, I real -- as more and more science migrates to computer simulations, I do think so. I mean, back then, I maybe didn't think so. But these -- I mean, I've read John Horgan's The End of Science, and there are other things that lead me to think that. So I don't think it's so implausible.

Q Is there anything besides our capacity to simulate biological or other physical events with computers, is there anything besides that that causes you -- that has caused you to shift your view about whether Meyer's assertion there is scientifically problematic or not?

A That particular -- this particular thing he's saying, so we're not talking about all Intelligent Design, but just what he's just saying here. That's probably the main thing. I mean, I'm not -- I guess I'm not one -- yeah, I am. I think there's a sense in which these are still at the level of conceptual points. So it's not like I would be looking for some kind of evidence or something that will have made this more plausible in any strict sense. And because I don't think of these matters in particularly theological terms,

it's not like I had a revelation or something that made me see that this -- this is kind of a conclusion I draw from the way in which science -- the contemporary practice of science is changing. I mean, see, the point -- the background point here is that throughout the history of science, so many of our models for understanding the world have been drawn from the technologies that we used in our everyday lives and for studying science itself. So, for example, as soon as the dynamo was created in the 19th Century, everybody thought that energy and generators were the stuff of life, and thermodynamics became the big thing. And largely, thermodynamics is just an abstract modeling of what an electric generator does, right, and how it gets energy and so forth. And so similarly, as computers become more and more integral to the way in which science is done in everyday life is done, I don't think -- and programming becomes more normal, people do their own programming, as that becomes more common, then I think this kind of design approach to things generally will gain greater credibility and make these more extreme design arguments seem more plausible than they do now because it becomes easier to think with. It becomes easier to think about. I mean, one of the problems with design arguments in the past was that because they were neither attached to anything terribly quantitative, and there was no technological way of really realizing them, they seemed very

abstract and metaphysical in that kind of bad sense, it couldn't be turned into scientific. But now we -- we're in a kind of situation.

Q See, and I still don't understand that because, I mean, I think we've agreed that in the case of Intelligent Design, it does not include any description of who the designer is, correct?

A Correct.

Q What its capabilities are?

A Correct.

Q What its motive are?

A Correct.

Q So I'm sure how -- I'm not sure I understand -- I'm not sure I understand how --

A Well, the --

Q If you could please just let me finish, how a human's modeling through computer simulation of what -- how aspects of physical life have occurred could be in any way connected to this sort of inchoate designer?

A Well, okay. Let me correct something I said earlier. I mean, what I think the computer program does allow you to do with regard to potential creator is a sense of not maybe the full power of the creator, that is to say, everything the creator could do, but rather the constraints under which the creator in fact operates when creating things. That's

something I think the computer can give you a very good sense of. And that's kind of the principle behind the explanatory filter, it seems to me. This idea of what are the consequences of laying down certain constraints, certain parameters within which then you allow things to develop. And I think computers really allow us a lot of capacity to do that. And that can get us in the mindset that's necessary to think about, you know, how worlds get created. At the end of the day, I don't think we're going to be able to figure out, you know, all the powers that God had or something like that. I don't think computer programming is going to be putting you in that state of mind. But I think it does enable us to think of the business of constraints within which creation can happen, which is very much an important part of the design inference. I think computers are very good in sensitizing you and forcing you to think about that in a very concrete kind of way.

Q Steve, I'm getting the sense, and you tell me if I'm right or wrong, that as you sit here today, you think the modern theory of evolution is a better explanation of biological life than Intelligent Design currently is; is that fair?

A Yes. But I am dissatisfied with it. But yes, that's true.

Q Okay. You're dissatisfied with it because?

A I do think a lot of these issues, the Intelligent Design people raise, and not just them, but also the complexity

theorists like Kauffman and others, about the idea that there are constraints on the possibility for life, right, that exists independently of what natural selection does, I think that's a serious issue that needs to be addressed. And in a sense, the Intelligent Design people have made that a very vivid problem. And that goes beyond just showing that there are gaps in evolutionary theory. That's actually trying to get us to sort of think about the issues a little bit differently. And so that's, in a sense, where I would rate Intelligent Design, and why I think it's good to teach to kids, because it kind of fuels the imagination in a way. So, you know, I mean, I think it'd be great to teach Intelligent Design in conjunction with certain kinds of computer programming where kids learn how to simulate worlds and stuff like that. I mean, I think that would be a very good content to bring that up and maybe do something with Dembski's explanatory filters there. You see, I mean, so that's kind of where I think -- where I think Intelligent Design is promising in a way to fuel the imagination. But if you're just asking at the moment right now, who explains, you know, biological phenomena better, evolutionary theory does. It's been around longer. It kind of controls the field in a way in the sense that you can't actually generate as it were approved biological phenomena unless you've been accredited as an evolutionary biologist, I mean, more or less. And so

it's not surprising that that's the situation. And my view about that is why not have another bunch of people who in a sense bring a somewhat different or overlapping, but not identical set of skills and sort of frame the problems a little bit differently, try to get at the same sorts of issues? Why not do that? I mean, this is -- it's in that context that I think Intelligent Design is worth pursing. But not because it's really kind of matched evolution.

Q It hasn't matched evolution. You haven't come to the conclusion that it's correct?

A No, I haven't.

Q Okay.

A No, I'm just saying it's worth pursuing. That a different issue.

Q Well, fair to say that you are skeptical about whether there is actually supernatural explanations for the history of biological life?

A What I would say is that I think history shows that supernatural explanations are very fruitful, but in the long-term become naturalized. So -- and that's a very important point because, again, if we're thinking about motivating people to do science, the fact that explanations turn out to be naturalistic in the end doesn't mean that you should have people starting off always thinking naturalistically. Rather there may be some advantage in

thinking in the supernatural way that, in a sense, there's some kind of radical sort of sense of reality that we're omitting from our theories and our ways of doing science, and that we need some different way of doing things. That has been fruitful in the past. Not always, but it has -- it -- there is -- there is track record for this. And -- and -- and so -- and I think that needs to be encouraged in a way. And in a sense, from that standpoint, naturalism seems incredibly dogmatic and restrictive, especially when we're thinking about the future of science, you know, with our kids.

Q Is it fair to say you're coming at this issue, your attraction to this issue is in large part because you think that the scientific establishment has become dogmatic about it?

A Yes, I think so. I mean, the fact that we have this lawsuit is a good example. Right? I mean, yes. I think so. And I -- and I think so especially on the biological front, more so than in the physics front, maybe because there are these very -- you know, these very politicized issues that this stuff can crystalize at, like these debates over textbooks and things like that. But I do think the evolutionary biologists are overplaying their hand here, and they're not doing themselves any good by trying to restrict sort of the free trade of ideas in their field.

Q Continuing your article, page 539, you have your conclusion, creationism's rhetorical virtuosity. And you say, I have no doubt that virtually any position in the philosophy of science can be used as a rhetorical resource to challenge the scientific establishment. What do you mean by that?
A Well, I mean, in the sense that philosophical positions, especially once they become recognizably philosophical, tend to be developed kind of independently of this -- you know, the science that they were originally associated with. So in a sense, they can be used as sort of rhetorical markers, right? So people holding opposite views can actually appeal to the same kinds of philosophical views. I mean, this happens with the demarcation criterion with all kinds of views.
Q And then you go onto say Meyer, for example, appeals to an especially strong form of scientific realism, inference to the best explanation, to combat the evolutionists.
A Yes.
Q What do you mean by that?
A Okay. There is this -- there is this force -- okay. So scientific realism basically says science is trying to come up with a picture of ultimate reality. Kind of in its most -- in its maximally coherent comprehensive sense. And you might say the paradigm case of this is Newtonian mechanics, which try to -- you know, explain all the physical

phenomena by the smallest set of laws. So, you know, and -- and -- and you want -- and so what you want to say, that no other explanation could have done it as well as Newton's could have. And so typically, this -- this involves trying to have lots of different things explained by kind of covering principle. And, well, this is kind of what Meyer is doing, right? Meyer is trying to do this kind of thing.

Q What do you mean by inference to the best explanation?

A Oh, well, the point is that no other explanation could provide as good an explanation. That there's a kind of, as it were, the kinds of things that you're trying to explain together, I mean, it's a bit like irreducible -- irreducible complexity is a great example of inference to the best explanation. Namely, if you say that a cell is this thing that hangs together in this very unique kind of fashion, right, then there can -- you know, there is only one explanation that actually can explain the uniqueness of that situation. Right. And the very idea of irreducible complexity trades on that. And so inference to the best explanation is the idea that for any given thing, right, there is always this one ultimate best explanation, right, that you can find from eliminating all the competitors. And -- and -- and the thing about it is, right, inference to the best explanation works if there is a very agreed upon sense of what needs to be explained. And then you say, well,

my theory is the only way that can explain it. You guys can only explain part of it.

Q And let's -- let's talk about that in the sense of the irreducible complexity. And I think -- I think what you said is, if I understood you correctly, is sort of it's the best that -- or tell me if you agree with this, that what Behe's saying is I can -- by using the proposition of irreducible complexity, I'm demonstrating that Intelligent Design is better explanation than those other explanations that are out there?

A Yes.

Q Okay. And obviously, the most sort of prominent of those explanations in terms of biological life would be random mutations and natural selection --

A Yes.

Q -- correct?

A Yes.

Q And he's saying that's not an adequate explanation for what I'm saying?

A Yes.

Q Therefore, Intelligent Design is the best explanation?

A Yes, that's roughly what's going on.

Q Okay. And obviously, we know there's been a number of challenges to sort of the first part of that, that a lot of critics have said, no, irreducible complexity really doesn't

demonstrate that natural selection didn't operate, right?
A Yes.
Q But then what I want to focus on is the second half of that proposition. Therefore, Intelligent Design is the best explanation?
A Yes, you're right, it doesn't follow. That's true.
Q It doesn't follow?
A That's true. It doesn't make it wrong. It just doesn't follow.
Q I mean, that's my question. There's no there there, is there?
MR. GILLEN: There there, is there? I object to the form.
THE WITNESS: No. You have to assume that you've eliminated all the rival hypotheses. Not just one. That's correct.
BY MR. ROTHSCHILD, CONTINUING:
Q And -- and -- and even if -- I think I would agree with that proposition. But then I'm still troubled by how you wouldn't -- on what basis are you making an affirmative case for design by an intelligent designer, or creation by intelligent designer?
A I'm doing it on a different basis, right? Namely, I'm trying to expand the possible explanations. I'm not arguing it the way Behe's arguing it.

Q No, no, I understand. But what I'm saying, you -- you -- you made a point which I think I agree with, which is, you know, Behe's, you know, effectively elim -- saying he's eliminated one possibility, but there might be other hypotheses, right?
A Yes. Demb -- Dembski has a similar problem, actually.
Q Okay. Okay. So both of them have this problem, right?
A Uh-huh.
Q Yes?
A Yes, yes.
Q Okay. But then I -- even granted your point, which I do, I'm still troubled by the idea that even if you could eliminate all the, for example, natural hypotheses that have been asserted, one could make a positive case for action by an intelligent designer. And I'm trying to understand how that follows, which I -- I -- I think is the conclusory proposition?
A Yes. I mean, yes. It doesn't follow. You're absolutely right. But typically what happens in these kinds of arguments, right, is that the Intelligent Design person, as the person who's always facing evolutionary challenge, has to make the Intelligent Design argument more specified, right? So what happens then is that the Intelligent Design argument becomes more precise. So I think what -- I don't see it as an inherent problem. It just means that there's -- there's never going to be a decisive moment where the Intelligent

Design argument wins by default by seeing off evolutionary challenges. That's all it means.

Q But I --

A It doesn't mean it ever -- at no point does it ever get shown to be wrong. It -- what -- it shows it hasn't eliminated alternatives.

Q And never would?

A That's entirely --

MR. GILLEN: Object to form.

THE WITNESS: I mean, that's entirely possible. And that's why some people object to the idea of inference to the best explanation as being a method in science, wherein a sense, right, the question is always open as long as there are alternative hypotheses available. People who believe in the inference to the best explanation do believe that all the opponents are eventually seen off.

BY MR. ROTHSCHILD, CONTINUING:

Q All right. And -- and -- and -- what -- and I -- but I -- and I'm still trying to get to the point, we're talking about inference to the best explanation. But I don't see how Intelligent Design is unexplanation at -- what the -- what the affirmative case is for Intelligent Design even being one of the alternatives?

A Well, I'm not sure. I mean, it seems to me that the possibility of space for Intelligent Design is opened up just

by denying what -- I mean, if you got -- if you got random mutation and natural selection as one hypotheses, right, then the other -- you know, the other hypothesis could be one where there is some kind of plan. And since the cell had -- you know, the cell is designed the way it is so that it could survive many different kinds of changes in the natural selection environment. That's not -- that's not an incomprehensible notion, right? I mean, it's just to make that specific so you could actually test whether it's, you know, it's -- it's true in a certain situation, I think that's the problem. It's not really specified enough. But, you know, I mean -- let me make a follow up point to this. Evolutionists and Intelligent Design people can go about criticizing each other and that's perfectly fine and that's very appropriate in science. But there is also -- you know, but as it were, the -- the -- the relative scientific status of the theories aren't just determined by those clashes and what happens in those clashes. But it's also determined by, as it were, how they take it home to develop their own theories independently. So if we take seriously the idea that Intelligent Design theory is in a way trying to scope out the phenomena of reality somewhat differently than the evolutionists are, so it includes cosmological issues and maybe supernatural issues, even, in a way in which evolution rules out of court, right, then what you're also looking at

is not how -- not only how these two theories relate to each other, but also how they develop in light of the criticism in their own terms. Do they go to the places they're trying to go to with regard to explanation and so forth? And so when somebody like Meyer, let's say, wants to have this kind of covering information theory as the metatheory of Intelligent Design, well, that's nothing -- you know, that's -- you know, evolutionists think that's just weird, right? But then he's trying to do something different. He's not trying to do what the evolutionists are doing. So while they do confict over certain areas like how do you explain the cell's stability, the overall goals of the research program are somewhat different, and so there are different kinds of concerns that they will then want to take forward when they develop their theories.

Q Go to the next page of the article, page 540. You invoke the well-known and highly regarded Fuller's Fairness Rule, which is if you appeal to metaphysical explanations at all, you must permit a plurality of them. And you also -- you go on to say virtually any metaphysical hypothesis can be maintained in the face of any negative evidence. Explain what's going on here.

A Okay. Well, this is, in a sense, kind of the -- it's in -- it's in a way trying to find a useful place for metaphysics and science. Okay. And the idea here being that when

metaphysics remains at the level of metaphysics, it becomes a kind of totalizing world view that people will hold no matter what the world is like, because they identify with the world view so much, right? The way things become science is by in some way translating that metaphysical world view into some kind of testable methodology that enables you to separate the people from the ideas, and get rid of the ideas when they're no good, and keep the people around. Now, the way to avoid the kind of totalizing tendency in metaphysics is to just allow lots of different metaphysical views free play, and then try to figure out some way of putting them in -- in -- in sort of some testable relationship with each other. So what you don't want is one metaphysical view dominating. And that includes science itself. So in a sense, you can take this as an argument against having a unified principle of naturalism, for example, in science, as well as supernaturalism, understood as totalizing views. You could have both, but you don't just want one or the other, okay, because then there's no way you can falsify it. And I think this raises the question, right, with natural -- I mean, I think that's a fair point to ask. Supposing I'm a naturalist, I have these naturalistic commitments to science, how would I falsify that? Is there some circumstance, if I'm one of these hard core methodological naturalists that Pennock is always talking about, you know, under what

circumstance as a scientist would I be willing to give up that belief? Are there any conditions? My guess is no because it's going to be defined in the nature of science that you have to be a methodological naturalist. Now, for me, that's just metaphysics if that -- if you end up with that kind of perspective on things. And so, I mean, this -- this is why I think methodological -- so-called methodological naturalism really is ultimately metaphysical naturalism.

Q Well, Pennock makes the case that, you know, methodological naturalism is not dogmatic, it's just what scientists do because it works, and that scientists haven't figured out how to expand science beyond that to include --

A But so do --

Q -- supernatural?

A But some people do try to test for these things, especially with paranormal phenomena. So there -- so as it were, there are active scientific research programs that are actually trying to stretch the boundaries of science beyond the so-called natural. And in any case, and -- okay. And those people are often regarded as fringe researchers in science. But really now, when we say -- when we talk about things working, and I'm not doubting that methodological naturalism has worked for science and that it's largely responsible for lots of science that we've got, maybe even most of science

that we've got. But the problem is when you -- when you use it, you know, if it ain't broke don't fix it argument, right, which is what it boils down to is where is the incentive within science to challenge methodological naturalism? In other words, where is there incentive within science as it's constituted today to actually try to scientifically test naturalism? And you see you just don't find it. And that's where these guys -- these Intelligent Design people come in. Because if nothing else, they're doing that, you see. But otherwise, it's dogmatic. If there is no -- if there is no incentive within the scientific community itself to challenge its most fundamental assumptions, then that view is outside of the domain of science and becomes metaphysics. And that's what's happened to naturalism within science today. You know, and -- and -- and -- and Intelligent Design in that respect can serve as an interesting corrective to this dogmatism regardless of whether it accomplishes its own positive program. And at the end of the day, of course, you don't know whether it's going to do that. But it will be interesting as a corrective to this kind of dogmatism.

Q You suspect that eventually the Intelligent Design will revert from this concept which involves supernatural explanations to something that leads to naturalism?

MR. GILLEN: Objection to form.

THE WITNESS: I mean, I think what will happen is that

this dispute will lose its salience after a while. Okay. I think that's true. I mean, and -- and so yes, in that respect, I don't -- I -- I mean, I actually -- I imagine a kind of renormalization of Intelligent Design within the scientific community. But I think in a context where the distinction between supernaturalism and naturalism isn't really animating people's imagination anymore.

BY MR. ROTHSCHILD, CONTINUING:

Q Because it's been discarded?

A Yeah, I think so. I think so because, see, naturalism historically has relied on a very robust sense of what empirical material reality is. Right. So the idea that, you know, the primary form of physical motion is this being in contact with this, right, and this is like empirically accessible, and it's, you know, physically constitued and all the rest of it. But increasing amounts of science these days are incredibly mediated. That is to say, they're not really in direct contact with the empirical physical phenomena we're supposedly trying to explain. I mean, even the evolutionists are, you know, speculating about, you know, what life forms were like millions of years ago and so forth, we're doing computer simulations all the time. And so from that standpoint, if you end up doing most of your science on computer simulation, and that the direct object of inquiry, the direct, not the ultimate, but the direct object of

inquiry is a virtualization of something, then I don't think naturalism has much pull there. Right. See, naturalism is -- is -- is a kind of -- is a -- is a -- is a sort of a remnant of a period when people were actually roaming around the earth looking at things, you know, and doing physical experiments and holding stuff and all that. But more and more of science is being mediated. And so that nature is receding. And so as that happens, I think this distinction between naturalism and supernaturalism will kind of disappear, won't be salient anymore, won't cause these kinds of disturbances.

Q Let's go to the last paragraph of your article. You use a metaphore here that -- of scientific knowledge currently is akin to tributaries issuing into a major river. And you suggest I want to reverse that because you presume that such such discoveries are already biased, and you support the development of ID theory as part of a general strategy of converting the image of knowledge to tributaries --

A Yes.

Q From that of tributaries to that of a delta.

A Yes.

Q Unpack that for me.

A Okay. Well, the idea here is that -- I mean, if you look at somebody like William Whewell, who I mentioned here in the paragraph, he -- he -- he kind of has this -- he starts off

with this tributary idea. And what he imagines, and so he's imagining basically how you got to Newton. If Newton is kind of like the one big river, right, the tributaries that are flowing into it are like Galileo, Copernicus, Keppler, all these guys, right, from the previous 50, 100 years. And then they consolidate into this one mainstream science, right, which then becomes the foundation, you know, for all of scientific work after that. That was his image, right. And he thought that in fact in the 19th Century, we'd gotten to that point with Newton. All right. Now, what I'm saying is I'm looking at it the other way around. Namely, that we -- yes. We have this kind of dominant mainstream science that is the result of all of these different things coming in, but we want to diversify the directions in which the science goes in the future. So to apply to the current issue at hand, my idea would be, yes, teach all of these kids all the details of evolutionary theory, all the evidence, all the claims being made, but encourage them to move it into different research programs, different theoretical directions, some of which contest the traditional assumptions under which that evidence had been gathered. So it becomes more like a delta in the sense you have many different research programs coming from a common body of knowledge, because at the moment, the tendency is that if you're going to do science, you have to learn it in some kind of dominant, paradigm way, and that if

you try to take things in a different direction, that you're somehow outside of science automatically. And that's the thing I'm objecting to.

Q So you want to sort of -- am I correct in understanding you're suggesting that we would benefit from sort of reversing the flow of knowledge?

MR. GILLEN: Object to form.

THE WITNESS: Well, I think what -- what one would want to do is to -- it's not so much reversing the flow of knowledge, but rather not presuming that the fact that knowledge has consolidated in a paradigm is necessarily a good thing for the future of science, and that rather, whenever knowledge consolidates, we want to encourage it to be used and developed in many different directions so as to get many different competing theories, because it's just all too easy, given the way in which science can be institutionalized through people being all trained in the same way to think the same way about things, and also given the amount of authority science still has in society for a dogma to solidify. And the thing is, we need to take measures to sort of prevent that. And that's why encouraging alternative viewpoints that take a lot of the same body of knowledge but taken in different directions is very salutary. And again, this is where Intelligent Design comes in as far as I'm concerned, as a kind of a -- as a kind of way of sort

of, you know, opening up the different futures that are available to science, using a lot of the stuff that evolutionists have been largely responsible for cultivating as evidence and so forth.

BY MR. ROTHSCHILD, CONTINUING:

Q Effectively like a wedge to break into the current dogma?

A This wedge notion, very sinister stuff. I -- I bel -- I think it's -- it's a problem that just not biology has, but I think all sciences have this problem of solidifying. And what you want to do is you really -- and it's also a way of making science meaningful to a broad range of people who come to science with many different kinds of interests, because I think especially people who don't know much about the history of science, there's a tendency to think that you have to think like a scientist in order to do good science. And thinking like a scientist is a certain kind of mindset that let's say doesn't allow you to have politics, doesn't allow you to have religion, doesn't allow you to have metaphysics. You have to leave all that stuff on the door, where in fact, those have often been very strongly motivating factors. All right. And in a sense, you want to encourage people to use those different motivations they have for doing science, but then be willing to publicly have their theories tested in the appropriate forums. That's when the scientific moment happens. Okay. And then once that happens, then the people

can take it in as many different directions as they want.
Q Is it fair to say that you don't have any particular attraction to Intelligent Design, but it's representative of a challenge to sort of current scientific behavior?
MR. GILLEN: Object to form.
THE WITNESS: Let's put it this way. I think it's true that I am more interested in Intelligent Design in terms of its function in the current scientific scene as a kind of, you know, loyal opposition, as it were, offering an alternative future for science and so forth than I am committed to any of the specific doctrines.
MR. ROTHSCHILD: Let me take a break.
MR. GILLEN: Sure.
(A brief recess taken at 2:30 p.m.)
MR. ROTHSCHILD: Ready, Bob?
COURT REPORTER: All set.
BY MR. ROTHSCHILD, CONTINUING:
Q Could you turn your report to page ten. In the first paragraph you had a sentence, ID proponents argue primarily by appeal to empirical evidence gathered in the laboratory and the field, employing methods of reasoning, both qualitative and quantitative familiar from the other branches of science. Let's start with the empirical evidence gathered in the laboratory and the field. What are you referring to there?

A Well, I'm actually referring to when ID proponents are dealing with evidence that people who've been doing evolutionary biology produced. So I'm not saying that they produce it themselves, but rather they are appealing to it and making reference to it.

Q So is it fair to say that so far as you know, Intelligent Design proponents have not been generating data from the laboratory in the field themselves?

A Well, actually, Behe, I think, has done laboratory work. I mean, I think he has. Of course, Dembski is a mathematician, and so he does what mathematicians do.

Q And when you talk about Behe doing laboratory work, I mean, are you referring to work that supports his Intelligent Design theory or other work?

A Well, I believe that he does do laboratory work that does support his -- his views, but most of his work is in fact the reinterpretation of laboratory evidence when it gets right down to it.

Q And then you say that they employ methods of reasoning familiar from the other branches of science. What are you referring to there?

A Well, so, for example, you know, the use of probability theory on the part of Dembski. These -- also the modes of explanation that we were in fact talking about earlier, the sort of inference to the best explanation, other kinds of

things like that. That's one of the reasons why philosophers get very interested in what these guys do, is because they're in fact using these modes of reasoning that they can see how, you know, in other branches of science they're used. But they're going to challenge them in this particular context.

Q And then later in the paragraph you say that ID proponents believe precisely that specific supernatural explanations are testable. What are you referring to?

A Well, I mean here the -- that the idea of coming up with specific constraints on -- on the param -- specific constraints under which design can happen, so something like Dembski's explanatory filter, right, properly specified would -- would not just be any -- providing any old supernatural explanation, but one that, as it were, has certain kinds of parameters within which certain phenomenon could be explained.

Q And your understanding is today that it's not -- it's not sufficiently specific?

A It hasn't gotten to that level yet, no. But that does seem to be an aspiration.

Q And other than Dembski, do you have other examples where ID proponents believe that specific supernatural explanations are testable?

A Well, they believe it. Whether or not -- they haven't produced any that -- that meet these criteria. But I think

that is the -- that is the aim. I mean, I think at this point, they're fighting a sort of a more general battle about allowing such explanations hearing in the first place.

Q Do you think that the absence of a naturalistic explanation is a test of a supernatural explanation for an aspect of biology?

A Not a proper test, but it certainly opens up the line of inquiry to pursue such things.

Q Why isn't it a proper test?

A Well, basically, it leaves open the question about what the explan -- because there's -- it could be that perhaps -- perhaps one hasn't come up with an adequate, you know, naturalistic hypothesis. Right. One, you know, as it were, scientists run out of imagination. But within the naturalistic sphere, they could perhaps come up with something. But the point is if there is an absence of a naturalistic explanation, that certainly opens -- that certainly provides an -- an interesting opening for people who want to think in anti or supernaturalistic terms. I mean, certainly from a heuristic standpoint, that would be, if you wanted to pursue supernatural explanations, that would be the place to go.

Q If you could turn to page 13, bottom of the last full paragraph, you talk about Miller taking advantage of the tendency of ID proponents to overplay their hand -- overplay

their hand rhetorically. What do you mean by that?
A This is -- yeah. I know -- I recall saying this. I just can't quite find where you're looking at.
Q It's the second full paragraph.
A Second full paragraph, okay.
Q Towards the bottom of the page.
A Right. I mean, the point here being that -- that if ID is able to provide a scientific explanation for something, that doesn't rule out the evolutionary one. But there's a tendency to sort of see these things, I think on both sides, in mutually exclusive terms. So if we can provide an explanation and you guys -- and you guys can't then, you know, in principle, we're the only ones who can. So, I mean, I do think that there's a tendency on both sides to think that the two are sort of mutually exclusive.
Q And you say then epistemological letigmacy of ID doesn't require showing that evolution cannot provide a credible --
A Right, right.
Q -- alternative framework, just requires showing that ID has an explanatory framework that can be the basis for a body of scientific research?
A That's right. I was making that point earlier with regard to the fact that you just can't judge the legitimacy of ID just purely in terms of how it faces up against evolution. You have to see how it is able to develop the stuff in terms of

its own framework.

Q And what is your understanding of the explanatory framework ID offers other than the assertion that evolution doesn't provide a credible framework?

A Well, I mean, this is where the explanatory filter and the irreducibly complexity notions get mobilized as a way of suggesting research avenues. I mean, that's -- that's the basic -- that's what I mean by the explanatory framework, that within which then research can be done.

Q But isn't irreducible complexity nothing more than the assertion that the evolutionary framework doesn't work?

A No, it isn't more than that, I mean, because the issue then depends -- determines -- it turns on how you actually develop this thesis, right. And presumably, what you want to do with the irreducible complexity is to identify as it were the parameters that -- all of which have to be in place in order to sell -- in order for the sell to have its stability the way it does, and that there's no way of removing any of those parameters without in fact undermining the stability of the cell, and that evolution cannot provide an alternative to that. So it seems that there is a self-contained research program that perhaps has not been fully executed but is suggested by the idea.

Q And I'm not sure what that is besides the fact that evolution or natural selection isn't an adequate explanation?

A No, no, it has -- no, it isn't that. I mean, it's to say that the cell has to have certain kind of components in place in order to have the stability it has so that it's able to survive all the various changes in the environment. Now, it seems to me that that project, if it were fully executed, could be done independently of anything going on in evolutionary theory. I mean -- I mean, so in that respect, Intelligent Design could be pursued as an independent program.

Q So if -- if Behe simply showed empirical evidence of the cell maintaining stability --

A Well, this is what I would say. I mean, I wouldn't do it that way. I would actually go to the computer simulation and try to model the cell, right, and actually try to come up with the parameters whose interactions end up producing a cell, right, a virtual cell, simulation of a cell, right, that is able then to maintain its stability in the face of the kinds of environmental changes that we normally think of cells as being able to survive in. Right. So if you were able to do that, and so he could then say, look, I've been able to program a cell, and you can do it this way, and there's not going to be an alternative evolutionary explanation for that. And as it were, then throw the gauntlet down and say, you come up with something that isn't as designed as this, that in some sense has a kind of random

element or something, and you still get this kind of stability over time. I don't think he's done that yet, but it seems to me it could be done. I mean, it'd probably be very difficult, but not out of the question. I mean, I'll tell you one advan -- one -- one thing about Intelligent Design that I think is worth pointing out is because you don't actually have departments and schools and disciplines of Intelligent Design, there's not a ready-made way of training people in the kinds of skills that'll be necessary to sort of carry out a lot of the details of this project. I mean, that's a real problem, I think, that they face sociologically at the moment because, you know, if you've only got a few guys kind of putting forward bold hypotheses and trying to do very sort of striking bits of forays, you know, challenging evolutionists, you can only go so far. You really need to train generations of people. In fact, that -- you know, that's how any science survives. And it was only starting in the 1930's and '40's that you start to be able to train biologists who have a sufficient range of skills to actually be able to contribute to Neo-Darwinism as this fully-fledged program that we see it today. So, you know, in a way, they do have a sort of sociological disadvantage here. They're basically trying to cover a lot of the waterfront all by themselves, and of course they don't have all the skills to do it. This is why they would need a school of people to

sort of carry this out.
Q Do you have any conjecture about why there isn't a school of people though?
A Well, I think one of the problems is the stuff doesn't get taught. I mean, this is where bringing it into the high schools would be a good idea in terms of recruiting the next generation of people, you know, as a kind of alternative to, you know, Neo-Darwinism, as a way of taking forward the kind of phenomena that's been identified in evolutionary biology. And presumably, that would be one of the reasons to in fact want to teach this in the schools, would be to create a fair fight as it were, to be able to seed a generation of students who might be motivated to try to carry this work forward because I think being realistic, there's only so much you can expect of Behe or Dembski to do themselves.
Q But if this was a proposition which had some legs, so to speak, that was, you know, that had the capacity to lead to a positive research program, you know, where is it in the universities, the Ph.D. programs?
A Well, you know, it seems to me that it may be a little too early, actually. And I wouldn't be surprised if there are some Christian universities or Islamic universities that are perhaps pursuing this kind of stuff now. I mean, again, I'm not familiar with it. But I'd be very surprised if there aren't programs trying to be established in this area. But

it seems to me, again, we have to look at the time scale. I mean, it took quite a while for Darwinism to get the kind of legs that we're talking about here, all right. And, you know, people like Charles Darwin himself were located outside the academy and, you know, the guys who were supportive of Darwin early on and for a while were themselves people who were specialists in certain kinds of areas but didn't have the full range of skills really to carry forward the whole thing in the -- in the -- as a big research program. I mean, it's only when you get to the 1930's and '40's, 80 years later that you actually start to get, you know, a group of people from coming from different directions who actually have a sufficiently broad range of skills to put it all together in some fashion. And it seems to me Intelligent Design is far away from that at this point. But then, you know, I wouldn't have discouraged Darwinism either when it was in its infancy and was struggling, you know. So I just think there's a sense in which this is one reason why it should be taught in the high schools as a way of trying to seed that additional generation so that you can start giving this thing some legs and start to see just how far it can go.

Q You say in your report that Intelligent Design is religiously heterodox?

A Yeah.

Q What do you mean by that?

A That means people who hold this view have different sorts of religious beliefs.
Q And what's your basis for that?
A Well, I believe some of these people are Protestants, some are Catholics. You know, so in terms of their theology, they're not necessarily compatible with each other. Some are quite fundamentalist, others are much more liberal in their theological orientations. Yes. I mean, that's just my -- my view. My basis for that view, because sometimes it is said Intelligent Design somehow wants to impose a theological orthodoxy on the school system, and you would have thought if that were the case, then these people would be theologically much more similar to each other.
Q Are you familiar with The Wedge document?
A I saw it referred to by -- is it Forrest?
Q Right.
(Marked for identification Fuller Deposition Exhibit No. 6)
THE WITNESS: I have not read it myself. Okay, okay. Looks interesting.
BY MR. ROTHSCHILD, CONTINUING:
Q If you want to take a few minutes to go through it --
A You want to direct my attention to something?
Q I will. I think the whole thing is --
A Sort of savor it in its full glory, is that it? Who wrote

this?

MR. GILLEN: That will be the subject of much discussion, no doubt, off the record.

THE WITNESS: Oh, I see. So someone knows?

BY MR. ROTHSCHILD, CONTINUING:

Q I know somebody who I was going to ask, but I missed that opportunity.

A Yes, yes. Okay.

Q You've had a chance to skim through the document?

A Yes, yes, I have.

Q And you have some sense of the flavor of the document?

A Yes, I -- yes.

Q Okay. I want to focus your attention on what's got the handwriting page four on the document, I'm not sure if it's the actual fourth page in order. But it says five year strategic plan summary.

A Oh, yes.

Q You see there that there's discussion about Phillip Johnson's books and Michael Behe's book Darwin's Black Box?

A Yes.

Q And it then talks about the theory of Intelligent Design?

A Yes.

Q Okay. And then it goes onto say design theory promises to reverse the stifling dominance of the materialist world view and to replace it with a science consonant with Christian and

theistic convictions. As an articulation of -- and let me reference, as you can see from the document, it indicates it's from the Discovery Institute?

A Yes.

Q And you've previously indicted the Discovery Institute is the think tank that's identified with Intelligent Design?

A Yes.

Q Assuming that this is in fact a -- you know, document representing the views of the Discovery Institute, what is your reaction to it as a representation of the concept of Intelligent Design?

A Well, it strikes me that here where there's this attempt to take Intelligent Design in making it into a major cultural force in American society, right? Specifically one that will overturn materialism which I guess is sort of a secular -- of secular world view. I questions that's the thrust of this document.

Q Okay. And if that's in fact the objective, is that -- do you consider that problematic?

MR. GILLEN: Object to form.

THE WITNESS: Well, I mean, it's certainly problematic if it's being taught as science in public schools. But presumably this document is somewhat targeted differently. So, I mean, I guess I would need more context to -- you know, in terms of in what sense problematic are you asking?

BY MR. ROTHSCHILD, CONTINUING:
Q All right. Let me be clear. I'm not suggesting to you that this document is being presented to the public school students.
A Right.
Q And what I am suggesting is it's a characterization of the Discovery Institute's view on the significance of Intelligent Design theory. And would you agree with that?
A Yes, I understand. Okay.
Q And would you agree it reads that way?
A Yes, it certainly gives the cultural context in which Intelligent Design makes sense.
Q And if this is the objective of the people who are developing Intelligent Design, do you consider that problematic?
MR. GILLEN: Object to form.
THE WITNESS: Well, again, it depends the context in which we're talking about Intelligent Design. Again, people can have all kinds of motivations, they may be thinking they're staging a cultural revolution. But what matters is exactly how their theories are tested. Okay. And even if it's true, that the authors that we've been talking about here in this deposition subscribe to this plan. The fact that they are submitting their stuff to this kind of scrutiny and criticism doesn't take away from that -- from the scientific character of the work in that forum, okay. I

mean -- I mean, because by that standards, you know, if you -- if -- you know, Nazi Germany was very big on Mendelian genetics. Okay. Racial hygiene program was based on that kind of thing. Right. Lots of documents were produced that actually made reference to Mendelian genetics as being, you know, sort of the backbone of a sort of racial hygiene strategy for the country. That, you know, Mendelian genetics is still around.

BY MR. ROTHSCHILD, CONTINUING:

Q Would you consider it problematic if Mendel has developed his theory in order to justify eugenics?

A I think it would be a problem -- well, the thing is, of course, there are some real geneticists who did do something like that. So we don't even have to look at Mendel. We've got some real guys. And it seems to me that there you still want to set -- I mean, you want to distinguish the context of discovery from the context of justification. And we may regard these geneticists as very problematic people, and we might dislike their politics and so forth, but at the end of the day, we have to see whether the science stands up, whether the claims stand up scientifically. And that's where it becomes important to have a sort of clear sense of, you know, criteria of testability. So in a sense, we can cordon off whatever unfavorable or unsavory associations these theories might have. And also to large -- to enable more

people to kind of deal with these theories, right? I mean, you know -- you know, one reason why you don't want the -- you don't want the Nazis to have a monopoly on Mendelian genetics isn't just because of all the atrocities they'll then be able to conduct. But also because it would restrict the -- the availability of Mendelian genetics to just those people and not allow it to have sort of more general purchase where it could actually be of use, you know, and maybe of some significance both scientifically and practically in the rest of society. And I would have a similar sort of line to say about Intelligent Design, that it would be a mistake to associate it too much with this particular movement, even if the people who are doing the Intelligent Design theory are associated with it.

Q So if I understand you correctly, and I'm sure you're right that there were geneticists who did their research to -- in service of the eugenics of the Nazis?

A That's right.

Q And I think what you're saying is as horrible as that is, that some of it may have actually advanced the science of genetics in a positive way that otherwise stands up as usable and constitutes good science?

A That's right. That's right.

Q And --

A Not necessarily though through the work they did as Nazis,

okay?

Q Oh, I understand. I'm not trying to negatively associate you in --

MR. GILLEN: For the record, he's not a Nazi.

BY MR. ROTHSCHILD, CONTINUING:

Q And what you're saying -- and what I think you're saying is that the way we can differentiate the valuable science from its maligned motives is through this standard of testability?

A Yes.

Q Okay. And that's -- and that similar standard is -- is what should be used to determine whether Intelligent Design has scientific merit?

A Yes. I mean, that's -- that's my general attitude. So in a sense, to neutralize the effect of something like this.

Q Okay. Do you understand -- do you take this document to be communicating a religiously heterodox view?

A It's very difficult to say, to be perfectly honest. I mean, my view about this document, I think this document is misleadingly optimistic in a sense about what it thinks it can accomplish because I think that all these various people who are being referred to here as part of Intelligent Design and contributing to this larger cultural movement in fact were they to somehow get into power, become commissars of education and research and things like that would in fact have many differences amongst themselves. Okay. So what I

think is more a common foe than any kind of common positive view, some monolithic Christianity or something that they would be imposing on the world, but rather they don't like secular materialism and they're all against that. It's kind of like my enemy's enemy is my friend. So I actually think there's -- there's, you know, there's kind of more -- more huffing and puffing going on than I think one really needs to be worried about. At least that's my own personal -- maybe I'm being naive, but that's my own personal view.

MR. ROTHSCHILD: Off the record.

(A brief recess taken at 3:33 p.m.)

MR. ROTHSCHILD: Back on the record?

THE WITNESS: How publicly is available is this document?

MR. ROTHSCHILD: I'll give you the back story off the record.

THE WITNESS: Okay, okay.

MR. GILLEN: It's quite a story.

MR. ROTHSCHILD: So much as I know.

BY MR. ROTHSCHILD, CONTINUING:

Q If you turn to page six of your report.

A Yes.

Q You -- this is maybe two-thirds of the way down, the full paragraph. You say that ID has an ambiguous position concerning matters of science and religion. What do you mean

by that?
A I'm just reading. I know it's a sentence. I'm just reading to see what it says. I do think that -- I mean, here what I'm saying is that I'm talking about in this paragraph is the way in which religious fundamentalism developed as a kind of a reaction against science, once with World War I, and all the ways in which science was involved in a lot of the sort of atrocities of the 20th Century. And that actually helped the rise of religious fundamentalism. And in a way, because ID does have some roots in the -- in the religion, that -- that it's been able to sort of cast itself, as one says, being scientific, and also kind of in a way sympathetic with these larger kinds of concerns. So it sort of straddles that rhetorically, it seems to me. I mean, in fact, you know, the Wedge document kind of is in a very extreme version of that.
Q And elsewhere in your report you say that ID's religious dimensions are both legally and scientifically benign.
A Yes.
Q What do you mean by religious dimensions?
A Well, I mean the motivations of the people doing it. Right. The extent to which these people who want to come up with ideas of Intelligent Design actually believe in a creator or something like that. And so they're benign in the sense that because the way they have to articulate their claims makes it subject to scrutiny by people who don't share those beliefs,

that then it enters into the realm of science, and it's religiously benign. Also -- I should say also I'm making reference to the fact that because they have these different religious views, there -- I don't actually believe there is a conspiracy against the public interest here, with all these -- contrary to this Wedge document. I actually don't believe there is that kind of unity. That in fact there's a diversity of religious views represented.

Q If you could turn to page 16 of your report.

A Yeah.

Q You report this NAS statement about the significance of evolution to the science of biology, correct?

A Yes.

Q And then you, I think it's fair to say, question that proposition?

A Yes.

Q And call into question whether Darwinian explanation -- Darwinian evolution actually has as much significance as suggested by the NAS?

A Yes.

Q And you call into question where you -- where you -- where you would look to determine whether the statement in fact has merit?

A Yes.

Q Have you studied this question of whether Darwinian evolution

actually has, you know, practical utility in the sense suggested by the NAS?

A Well, it seems to me that there -- that there is, I mean, as I point out later on, right, they sort of hedged the issue by talking about helping to explain. They don't actually claim themselves -- I mean, they kind of hedge the issue. So on the one hand, if you read the statement superficially, they're claiming that evolution is, you know, essential for all these different fields and all these different things. But then if you read closely, they say it helps to explain. So in other words, they don't actually -- they themselves don't want to quite commit themselves to the idea that all these people from these different sciences are actually using evolution themselves, okay?

Q Well, I mean, let me observe, I think that is a pretty superficial reading because would you expect them to say if evolution -- the concept of evolution by itself explains all these phenomena?

A Well, if it is a covering theory of the biological sciences, then in some sense it should, actually. I mean, and I think that there's a sense in which, you know, when it's portrayed in a sort of -- in a -- in a sort of a -- oh, like maybe in a textbook, where it's presented as a kind of the covering theory of all life, yes, there's a sense in which all the other theories of the other biological disciplines are in

some sense explained by evolution to a natural selection. So for example, let's look at the cell example from Behe, right? Cytology, the science of cells, right, dates -- predates Darwin, largely seen as beginning in the 1830's, 1840's, and has gone about its own trajectory largely. And so not surprisingly, Behe saw this as kind of a ripe target for trying to say, look, you know, the reason -- you know, you didn't need Darwin to have the science of the cells, and -- and in fact, you know, you could have some other kind of explanation for why cells have the kind of stability they have because the science of cytology hasn't had -- hasn't had to rely very much on evolutionary biology at all. Now, what the evolutionary biologist has to say, and this is what they do say againt Behe, is that in some sense, cytology, like all these other branches of biology are explanatorily subsumed under random mutuation and natural selection, that in some sense, these are all applications as it were of evolutionary theory. That is the goal if you have this kind of very expansive sense that evolution is being the covering science of biology. It's a bit like the way Newtonian mechanics was when it was the covering science of physics. So in a sense, it's quite recognizable what the -- what the aspiration being expressed in the paragraph is. But it's just not true on the ground. I mean, that's my point.

Q But what's not true? I mean --

A That these different branches of biology require evolution to explain what they're doing.
Q So you -- you -- you -- I think we need to be clear about our terminology here. Are you suggesting that the theory of evolution is completely unnecessary to the --
A Well --
Q -- explanation of the phenomena that's described in this paragraph?
A I think for most of these sciences -- most of these sciences have spent most of their existence independently of any kind of evolutionary theory. And I think most of them today could be conducted even if the theory of evolution by natural selection and random mutation was called seriously into question. All of them -- almost all of them could probably survive pretty well intact because in fact the concept of evolution isn't really relied on very much by the day to day practitioners of these biological disciplines.
Q And how do you know this?
A Well, I mean, this is where I bring up this other character Rasmussen in the next page, right. And there, right, he is making a complaint about a book by Elliott Sober on the philosophy of biology that in fact is really only about evolutionary theory, and so he makes this point. Right. He says, look at all these different branches of biology, they could exist all quite independently without making any

reference to evolution, and some of them could even do perfectly well with assumptions that are contrary to evolution, like Lamarckianism and even creationism gets cited in this paragraph. And so from that standpoint, this is no reputation of evolution, mind you. But it is saying that revolution -- that evolution is kind of a theory that in a sense has an independent existence of what goes on in these different branches of biology.

Q What about the work coming out of the human genome project? Do you think that is -- relies on the scientific theory of evolution?

A Well, it certainly relies on DNA and genetics and so forth. And there have been some linkages between that and the theory of evolution, but they're relatively independent even that. I mean, if you look at -- if you look at research published on the human genome, I mean, what percentage of it is actually making reference to evolution? I mean, human genome is very important from the standpoint of manufacturing pharmaceuticals and synthesizing, you know, amino acids that can lead to all kinds of interesting other developments and drugs and things like this. But exactly, you know, what aspect of it connects up with evolutionary theory is relatively small. I mean, obviously, there is -- evolutionary theorists can find relevance in the human genome project, that's for sure. Right. Just like evolutionary

theory can find relevance in all the different branches of biology. But if you turn the question around and ask, do these branches of biology need evolutionary theory to conduct their business? The answer is, for the most part, no.

Q That's true of the human genome project?

A I don't think the human genome project requires the full, you know, theory of natural selection by random mutation in order -- in order to conduct its business. And in fact, the people who have been most instrumental in actually synthesizing the genome and doing stuff with it, right, I mean, they're not known as front line evolutionists. They're not necessarily anti-evolutionists, but that's not what they work in. I mean, I think it's a -- it's a kind of a -- it's a sort of presumption that gets made. I don't think it's -- it's necessary. And the reason why I cited Rasmussen is because Rasmussen offers the evidence of looking at, you know, journals published in biological abstracts, which is the main kind sort of information science facility where all the main biology journals are located, and just look at how many of them make reference to the kind of terms you'd associate with evolution in their titles. And you find out that it's less than ten percent, okay, which is really very, very small. Now, I'm not denying that these biologists believe in evolution. I think maybe most of them do believe in evolution. But is the evolution actually intimately

connected with the biological research that they do? Well, on the evidence of the journal articles and what they talk about, the answer would be no. And what -- and I make this point because my interest is in saying, look, we could have a serious debate about whether evolutionary theory is true or false or worth pursuing or whatever, without worrying that the rest of biology would go down the tubes if we were to seriously question it. Because what I worry is that the statement from the National Academy of Sciences is in fact kind of alarmist, right? Basically saying, you challenge evolution and there goes all these biological sciences. And I actually don't believe that's the case at all.

MR. ROTHSCHILD: Pat, why don't we take like a five, seven minute break. I think I'm near wrapping up. Probably worth calling the cab.

MR. GILLEN: Certainly, good enough.

MR. ROTHSCHILD: Okay?

MR. GILLEN: Yep.

(A brief recess taken at 3:55 p.m.)

BY MR. ROTHSCHILD, CONTINUING:

Q Steve, we discussed the article you wrote in Rhetoric and Public Affairs?

A Yes.

Q Other than that article, have you written other articles on the subject -- specifically on the subject of Intelligent

Design?
A Well, I did this thing for the Open University, a collection of readings and commentary which is used as part of the master's in science program, science communication there. I mean, the Open University, for the record, is a distance learning institution that has about 300,000 students in Britain.
Q And what exactly did you -- what was your product?
A Okay. Well, what -- it's so there would be some -- there would be some reading, some articles that represent the various sides of the issues, are science and religion compatible. That's the topic. And it's part of -- so it's part of the science communication course where students will be learning aspects about the public understanding of science, basically. In fact, I wrote this around the period I did this cyberconference here. And what I did was I collected together some stuff, including a chapter from a historical book on the relationship between science and religion, especially in the late 19th Century with Darwinism. Also have an article by John Angus Campbell in there on the need to teach the -- the Darwin creation dispute in the classroom. Also a piece by Eugenie Scott, one by Behe, part of his Darwin's Black Box. Steven Weinberg, I think, is in there, too, as someone who is quite critical of design. Trying to think. Yeah, Larry Laudan, that piece that Larry

Laudan wrote criticizing Michael Ruse and his participation as an expert witness. And an article by -- or a chapter of one of Steven Carter's books about the role of belief in public life. Yeah, and the thrust of the thing was basically to make the argument that -- that -- that science and religion have historically been compatible, but that for specific reasons having to do with the legal system in the United States, this issue kind of flares up because of the separation of church and state. And -- and so the way the thing is arranged is you get these readings, and then you have my commentary, and then I do some questions that are meant for classroom discussion afterwards.

Q So and your commentary -- I mean, you know, are they -- how would you characterize what your actual written product is as distinct from the other writings?

A Basically laying out some of the assumptions, filling in some of the background detail, and sort of raising some problematic issues that the authors are, in a sense, perhaps not bringing to the surface. That kind of stuff. I mean, it's not meant to be a kind of advocacy piece, but rather to sort of explain why science and religion have been in conflict with each and why in a sense, there's a sense in which there are some very particular origins to this, that it's not necessarily inherent in the two things that they be in conflict with each other.

Q And how would I get my hands on --
A Well, I think you -- I sent you a copy.
MR. GILLEN: I think we probably provided it to you.
MR. ROTHSCHILD: I don't think so.
THE WITNESS: Because I sent you a copy of it.
MR. GILLEN: I sent you --
THE WITNESS: I sent you earlier on.
MR. ROTHSCHILD: We don't need to -- you know, but if you --
MR. GILLEN: If not, I will check, certainly, and make sure you have it.
THE WITNESS: I sent it to you earlier on before I sent all the other -- the stuff that was supporting this. I sent it to you separately, maybe back in April.
MR. GILLEN: Okay. You want to take a break and see if I can find it, while we're here? I'm sorry, I don't --
MR. ROTHSCHILD: Yeah, sure.
(A brief recess taken at 4:10 p.m.)
MR. GILLEN: Sorry, I can't find it.
MR. ROTHSCHILD: Okay. Well, let's handle it this way. I would like to get a copy, I'm sure you can provide it. If for any reason we need to reconvene we'll do it by phone.
MR. GILLEN: Okay, good enough.
(A brief recess taken at 4:12 p.m.)
MR. ROTHSCHILD: Let's just go back on the record. The

document -- the course materials that Steve's talking about I believe were not provided to us as part of the expert production. And we've reached an understanding that once we receive those materials, if there's any need to reconvene the deposition, we can do that by phone.

MR. GILLEN: I'm amenable to that.

MR. ROTHSCHILD: Okay.

BY MR. ROTHSCHILD, CONTINUING:

Q Other than what you've just described, we've talked about the article in Rhetoric and Public Affairs that was reproduced in Darwin, Design and Public Education, we've talked about these course materials. Have you done any other writing on Intelligent Design?

A I don't believe so. Let me think a minute. Can you give me a moment to think about that?

Q Yeah.

A I have written on Darwinism in other places, so I have written on the other side of the issue. Let me see. No, I don't believe so.

Q Is it fair to say that the bulk of your study or research of Intelligent Design was done in furtherance of preparing this on-line course?

A Yes, I guess so. I guess that's correct. Yes. I -- certainly, that was where I got kind of the -- the basic stuff on which I built, yeah.

Q Okay. And since that time when you compiled these materials for the course, have you made a point of keeping yourself abreast of the writings of intelligent -- of scientists or philosophers or mathematicians who are proving the content for Intelligent Design?

A Yes, yes. I do try to -- try to monitor that literature, sometimes reading more deeply at other times, than others. I mean, it's not that hard to sort of monitor the literature. I was mentioning, you know, you may know this, the arts and letters daily com on the web. That's -- which tends to sort of excerpt various sort of intelligentually oriented pieces for magazines, newspapers and so forth. And they always are picking up stuff in the Intelligent Design evolution controversy where it arises. And then I sort of start following up leads about what book has been published, and what articles have been published and so forth, because there are a lot of ways of finding out if one looks for it. So it's not that hard to kind of get up to speed on these things.

Q Okay. And -- but when you do this, I mean, are you actually going and reading the source material?

A Yes, sometimes. Yeah, sometimes, yes. Not always, but sometimes, yes. So like, you know, with Michael Ruse's book, Darwin and Design, I read that. I'm going to be reading the new book he's got out, Evolutionism. And yeah, but sometimes

I don't read -- I don't read everything. I don't read it religiously as it were.

Q For, you know -- I mean, for example, have you, you know, Dr. Dembski has written a number of books since his -- since the Design Inference?

A Well, yeah. And many of them have been -- they've been edited. I've sort of -- I've sort of ignored those. No. Like I said, I'm not a religious follower of this literature. I mean -- I mean, that's why I'm just not quite sure just how far advanced they've gotten from the sort of major statements and the major debates surrounding them.

Q Is it fair to say that you've followed the -- followed the philosophical discussion of the topic more than the, for lack of a better word, scientific writings?

A Well, on the surface the answer would be yes except that these things are very closely intertwined, and that often, especially with Dembski's work, you know, because he's a mathematician, the philosophers who are quantitatively oriented are often in the best position to kind of make the salient criticisms of his arguments, more so than the scientists are. So I kind of follow the criticisms where they come from. But they do tend to be more philosophical just generally. I mean, scientists' arguments are often not quite as sophisticated. I mean, the philosophers have been taking this stuff a bit more seriously.

Q Uh-huh. You refer, I think at footnote 11 to a book by --
A Oh, yeah.
Q -- Thomas Woodward, Doubts About Darwin.
A Yes.
Q What is that book about?
A Okay. This was a guy's Ph.D. thesis originally. And what it is, he basically followed various people around who've been debating the Intelligent Design/Darwin issue publicly. You know, so when Phillip Johnson and Stephen J. Gould were debating, I mean, he'd follow all these people across the country. And he's basically charting sort of the development and the arguments that are taking place. And one of the points that he makes is that in fact Intelligent Design people kind of have evolved, you might say, as they've interacted with scientists and they've made more sophisticated arguments and so forth. And so there's been a kind of learning curve, you might say, that now makes Intelligent Design a much more sophisticated theory through the interaction with the scientists. I mean, it's the kind of thing, you know, the sort of thing that John Angus Campbell kind of says would happen, he sort of documents it. And as a participant observer, which means that he's kind of there in the meetings, asks some questions, you know, and then writes about it.
Q Do you have any relationship with Mr. Woodward?

A Do I have any relationship with him? I did teach this book in -- at UCLA when it was still in its proof form. I mean, I know -- you know, and I have been in contact with him actually because he does derive some kind of methodological inspiration from some of my writings in the appendix of the book. But I've never taught the man, I've never met him personally. By the way, the context I would say where -- where he is drawing some inspiration from me relates to the questions that you were raising earlier about the tributary delta stuff, about the idea of broadening out the scientific base so that larger numbers of people can have access to stuff. That's the kind of thing that he found intitially attractive, which comes up in this book mine on Thomas Kuhn.

Q I think you said very early in our discussion that Intelligent Design is not taught as part of the biology courses at Warwick University?

A That's correct.

Q Okay. And --

A But we do teach, you know, in this philosophy master's degree thing, we do teach it. And so --

Q Okay. But I'm correct that it's not part of any of the natural sciences curriculum?

A No, no.

Q Have you ever advocated at the university that Intelligent Design be taught as part of the natural sciences curriculum?

A No, I have not.
Q Why not?
A Well, I don't -- I guess I just -- I haven't thought I was in a particularly persuasive position to convince the natural scientists about teaching anything other than what they already do. I mean, so it just didn't seem to fall to me to do that. I guess that would be the main reason. Also I do think there is this issue we keep on going back to about what's the appropriate faculty for discussing these matters. And that in the case of some of these things, that a mathematics or statistics department might be better than a chemistry or biology department for a lot of this stuff. So I think there's a kind of open question about where exactly would you want to be placing the study of this thing.
Q Same question applies to the high school level?
A Well, the high school level, the science courses are much more generic, aren't they? I mean, so -- and also I think there's a different purpose as well, because at the high school level, there is a sense in which you're trying to seed the next generation of scientists potentially. I mean, that was something that even your guy, Alters, brought out. And that it becomes important then to think about the different scientific perspectives in light of that, whereas by the time you get to university, people are training to be professionals already in a given science. So they're sort of

already engaged in a kind of more technical sort of thing. And that's -- it's harder to insitutionalize at that level. I think it actually would be easier to institutionalize at the high school level.

Q Wouldn't it make sense at the undergraduate level, to seed the next generation of scientists, when the students are --

A Well, okay.

Q -- sophisticated?

A My -- I should explain something. In Britain, you come in already specialized. I mean, you see, in America, it's quite common for the first year or two of the undergraduate level to in a sense be searching around for a major. And so, yes, in that context, I think that's a -- that's actually right. So I take your point there. But I was thinking about the British context, right, where you sort of start specializing -- you get admitted into a university in a subject. And that's why the degree program is a three year rather than a four year program.

Q Could you turn to page 11 of your report.

A Yeah.

Q And at the bottom paragraph, you talk -- you talk about most philosophers having resisted the charms of naturalism.

A Yes.

Q And that's -- I take it you're distinguishing them from scientists who, to a large extent, have succumbed to the

charms?
A Yes, yes.
Q And one of the things you say is that this refusal to commit to naturalism is less an ostrich like reaction to the inevitable march of scientific progress than an allergic response to guild-like arrogance of scientists. What do you mean by that?
A Well, I mean, philosophers, I mean, people who remain philosophers and stay philosophers typically believe that none of the major questions about -- that are associated with the nature of reality have been closed. And the problem is that the development of science out of philosophy, all the sciences come out of philosophy historically have involved closing down assumptions. You know, in other words, we're going to start with certain things as fundamental and then move on from there, and if you can't agree on those fundamentals, you're not part of the scientific team. And so physics does this, and now biology does this. And philosophers, generally speaking, want to keep an open mind about the fundamental foundations of knowledge being questioned. Okay. And so in that respect, they can't go along with science in that regard because science, typically, involves closing down at some point.
Q And I take it that's part -- that, to a large extent, explains your approach to this issue is a reaction to the

guild-like arrogance of science?
A Yes, I'm on the -- yeah, I'm in a sense -- yeah, I sort of am on the philosopher's side on this matter.
Q Okay. And you suggest -- you recall the figure of the skeptic who always imagines an alternative explanation for any apparently straightforward phenomena?
A Yeah.
Q And I take it that's where you find ID's place in the world?
A Yes. I think that, yes, in the great scheme of things, yes. That's -- yeah. With regard to especially these issues surrounding evolution.

MR. ROTHSCHILD: I have no more questions.

MR. GILLEN: Let me look in one more place for that.

(A brief recess taken at 4:20 p.m.)

MR. ROTHSCHILD: All right. Back on the record.

MR. GILLEN: Sure.

MR. ROTHSCHILD: Counsel for the defense has produced a copy of the course curriculum for the Open University that Steve was referring to. And I'm going to take that copy. It's sufficiently lengthy that I'm not going to be able to process it in the short time before this deposition ends. And I think we'll just adhere to our agreement that if there's any need to reconvene the deposition just to -- just for questions on this topic, we'll do it telephonically.

MR. GILLEN: Yes. And again, I am amenable to that.

MR. ROTHSCHILD: Okay. And with that, off the record and thank you very much.

THE WITNESS: Thank you. Thank you. It was a lot of fun.

(Deposition adjourned at 4:21 p.m.)

* * *

VERIFICATION OF DEPONENT

I, STEVE WILLIAM FULLER, PH.D., do hereby certify that I have read the foregoing deposition taken on June 21, 2005, and that, to the best of my knowledge, said deposition is true and accurate (with the exception of the changes/corrections as attached hereto, if any).

_____
STEVE WILLIAM FULLER, PH.D.

Subscribed and Sworn to before me this _____ day of _____, 2005.

_____
_____, Notary Public
_____County, Michigan

My commission expires:

_____

CERTIFICATE OF NOTARY PUBLIC

STATE OF MICHIGAN)
) SS
COUNTY OF MACOMB)

I, Robert E. Bouck, Certified Shorthand Reporter and Notary Public in and for the State of Michigan, do, hereby certify that the witness whose attached deposition was taken before me in the above cause was first duly sworn or affirmed to testify to the truth, the whole truth, and, nothing but the truth; that the testimony contained herein was by me reduced to writing in the presence of the witness by means of Stenography; afterwards transcribed by means of computer-aided transcription; and that the deposition is a true and complete transcript of the testimony given by the witness to the best of my ability.

I further certify I am not connected by blood or marriage with any of the parties, their attorneys or agents; that I am not an employee of either of them; and that I am not interested directly, indirectly or financially in the matter of controversy.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Notarial Seal this _____ day of _____, 2005.

_____
Robert E. Bouck, CSR-3530
Notary Public, Macomb County, Michigan
My Commission Expires: 08-03-06