

0001

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19

PRESENTATION HELD BEFORE THE SCIENCE COMMITTEE  
OF THE  
KANSAS STATE BOARD OF EDUCATION

TRANSCRIPT  
OF  
PROCEEDINGS

Held on the 5th day of May, 2005,  
beginning at 8:30 a.m., at Memorial Hall, 120  
West 10th Street, in the City of Topeka, County  
of Shawnee, State of Kansas, before Dr. Steve  
Abrams, Chairman of the Kansas State Board of  
Education; Ms. Connie Morris, member; and Ms.  
Kathy Martin, member.

APPEARANCES

The Minority appeared by and through its  
counsel, Lathrop & Gage, 2345 Grand Boulevard,  
Suite 2800, Kansas City, Missouri 64108, by  
Mr. John H. Calvert and by Arnold & Porter, 555  
Twelfth Street, NW, Washington, DC 20004, by  
Mr. Edward Sisson.

The Majority appeared by and through its  
counsel, Iri gonegaray & Associates, 1535  
Southwest 29th Street, Topeka, Kansas 66611,  
by Mr. Pedro L. Iri gonegaray.

25

0002

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17

I N D E X

Certificate----- 263

P R E S E N T E R

ON BEHALF OF MINORITY:	PAGE
WILLIAM H. HARRIS, PhD	
Direct Examination by Mr. Calvert	17
Cross Examination by Mr. Iri gonegaray	62
Examination by Chairman Abrams	75
Examination by Ms. Morris	84
CHARLES THAXTON, PhD	
Direct Examination by Mr. Calvert	88
Cross Examination by Mr. Iri gonegaray	118
Examination by Ms. Morris	130
Examination by Ms. Martin	131
Examination by Chairman Abrams	132
JONATHAN WELLS, PhD	
Direct Examination by Mr. Calvert	138
Cross Examination by Mr. Iri gonegaray	173
Examination by Ms. Morris	188
Examination by Chairman Abrams	191
Examination by Ms. Martin	195
BRUCE SIMAT, PhD	
Direct Examination by Mr. Calvert	198
Cross Examination by Mr. Iri gonegaray	221
Examination by Ms. Morris	224
Examination by Chairman Abrams	226

18	Examination by Ms. Martin	228
	Examination by Chairman Abrams	230
19		
	GIUSEPPE SERMONTI, PhD	232
20		
	RALPH SEELKE, PhD	
21	Direct Examination by Mr. Calvert	233
	Examination by Ms. Morris	256
22	Examination by Chairman Abrams	259

23  
24  
25  
0003

1 CHAIRMAN ABRAMS: On behalf of the  
2 State Board of Education, I welcome you to  
3 these hearings. My name is Steve Abrams, I am  
4 chair of the State Board of Education and also  
5 chair of the science subcommittee. My fellow 08: 31AM  
6 board members with me here on the subcommittee  
7 are Mrs. Connie Morris, Mrs. Kathy Martin.  
8 The purpose of the hearings that will be  
9 held over the next several days is to assist us  
10 as board members in understanding the complex 08: 31AM  
11 and oftentimes confusing issues regarding  
12 science education.  
13 A brief history of how we arrived at  
14 these hearings may be helpful. In June of last  
15 year a state-wide committee appointed by the 08: 31AM  
16 Commissioner of Education and comprised of 26  
17 public and private educators spanning  
18 elementary, primary, secondary and post  
19 secondary levels, retired educators, curriculum  
20 coordinators, and private practice physicians 08: 31AM  
21 began the process of reviewing and revising the  
22 state science standards.  
23 The writing committee met several times  
24 between June and November and presented a draft  
25 of the standards to the State Board in December 08: 32AM

0004

1 of 2004. At the same time eight members of the  
2 writing committee submitted what is now  
3 referred to as the Minority Report asking the  
4 State Board to consider some changes to the  
5 draft. Through much discussion at the state 08: 32AM  
6 board subcommittee, the three of us, were  
7 formed to further examine the issues contained  
8 in the Minority Report. Also, after much  
9 discussion it was decided that the best forum  
10 to address the issues was via hearings, such as 08: 32AM  
11 these we'll have over the next several days.  
12 In order to conduct the hearings in a  
13 reasonable time frame and in a civil matter  
14 there are a few house rules and procedures that  
15 you, the audience, and indeed all of us need to 08: 32AM  
16 be aware of. First, we're on a very tight,  
17 tight schedule. We have more than 20 experts  
18 appearing before the subcommittee within the  
19 next three days, it is critical that we stay on  
20 schedule. In order to do this I request that 08: 32AM  
21 no comments come from the audience. The expert  
22 witnesses have come from quite a distance to  
23 present their information, we should allow them  
24 every courtesy.

25 We ask that you do not display signs of 08: 33AM  
0005

1 support or opposition by yelling, applause, and  
2 so forth. We would also ask that each of you  
3 turn off your cell phones, please. Each  
4 experts' testimony has been given an allotted  
5 amount of time as determined by the presenters. 08: 33AM  
6 Following the expert's presentation the legal  
7 counsel for the opposing viewpoint will be  
8 given half that amount of time to ask  
9 questions. Following that we, the subcommittee  
10 members, will be given half of that time to ask 08: 33AM  
11 questions. For example, if an expert testifies  
12 for 20 minutes, the opposing counsel will be  
13 given ten minutes for questioning and the  
14 subcommittee members will be given five minutes  
15 for questioning. The time for questions will 08: 33AM  
16 be adhered to, therefore the questions should  
17 be succinct and not sound like a speech. We  
18 will take one ten-minute break this morning at  
19 10:40, break for lunch at 12, resume at 12:55,  
20 with another ten-minute break at 3:30, and 08: 34AM  
21 adjourn for the day at about 5:30. We'll  
22 follow the same schedule for the next two days  
23 and also on Thursday, May 12th.

24 If you leave for the day we'd ask that  
25 you please give your name tag to the KSBE staff 08: 34AM  
0006

1 at tables outside the auditorium.  
2 Additionally, please note that Memorial Hall  
3 does not allow food or drink in the auditorium.  
4 We would ask that you kindly abide by this  
5 policy. 08: 34AM  
6 Before we begin I'd like to make some  
7 introductions. Right here to my immediate  
8 right is Mr. Pedro Irigonegaray and Mr. Evan  
9 Kreider, they're legal counsel for the  
10 mainstream viewpoint. On the other side just 08: 34AM  
11 facing me is Mr. John Calvert, legal counsel  
12 for the members who wrote the Minority Report,  
13 and assisting him is Doctor Bill Harris, and  
14 also Mr. Edward Sisson. Additionally, a court  
15 reporter is recording all of the proceedings 08: 35AM  
16 and a transcript will be made available to the  
17 public at a later date. Thus, to those that  
18 are speaking, speak clearly. Also if she has  
19 problems, and she's going to notify us, we're  
20 going to ask you to slow down or to repeat and 08: 35AM  
21 try not to talk on top of each other. I thank  
22 you for your interest in Kansas education.  
23 Thank you. Mr. Calvert, attorney for the first  
24 witness.

25 MR. CALVERT: Mr. Chairman, members 08: 35AM  
0007

1 of the committee, authors of the Minority  
2 Report, and members of the writing committee,  
3 Mr. Irigonegaray, members of the press, and the  
4 public, I want to thank you for this  
5 opportunity for the public and the committee to 08: 35AM  
6 view the scientific reasons for the Minority  
7 Report and the basis for it. I would like to  
8 introduce briefly by colleague, Mr. Ed Sisson  
9 is a lawyer from-- with Arnold and Porter from

10 Washington, D.C. and came all the way out here 08: 36AM  
11 to assist. Unfortunately Ed's job was to  
12 examine the opposition witnesses, which we know  
13 now will not be with us, so he is assisting me  
14 today.

15 At this time I would like to go 08: 36AM  
16 immediately into the examination of our  
17 witnesses. I'm going to save any of my remarks  
18 about the proceeding for my testimony, which  
19 will be expected at the end of the proceedings  
20 on Saturday. Also, Doctor Harris, who is our 08: 37AM  
21 first witness, Doctor William Harris, will  
22 provide a brief overview as to what our  
23 witnesses will be expected to show to the  
24 public and to the committee. Doctor Harris.

25 MR. HARRIS: Thank you, Mr. Calvert. 08: 37AM

0008

1 Is it on now. Great. Thank you. Thank you  
2 all for having us here and for this hopefully  
3 very interesting three-day-- three, four days  
4 we're going to be sharing together.

5 I want to begin by discussing what I 08: 37AM  
6 think we would like to accomplish with these  
7 hearings, at least from our prospective. First  
8 of all, we hope to show that there is a  
9 scientific controversy over two major aspects  
10 of evolutionary theory. Chemical evolution 08: 37AM  
11 that is the arrival of life from nonlife and  
12 macroevolution, which is the development of  
13 complex life forms from simple life forms.  
14 Those two issues, I think, are what's on the  
15 table. 08: 38AM

16 What's not on the table is what we call  
17 and many call microevolution, also part of  
18 Darwin's theory that species adapt to changes  
19 of environments by natural processes only in  
20 this occurrence within certain limits. The 08: 38AM  
21 question is what are those limits. We  
22 anticipate demonstrating that there is really a  
23 scientific controversy.

24 Secondly, we want to make the point that  
25 this controversy has profound implications for 08: 38AM

0009

1 religion and philosophy. If this didn't have  
2 implications to religion this room would be far  
3 emptier today. Because it impacts religion and  
4 the reason that this issue does impact religion  
5 is because we're dealing with what we call 08: 38AM  
6 origin science. Origins, the beginnings, where  
7 did things come from, where did we come from,  
8 where did life come from. These are issues  
9 which ever major religion in the world has a  
10 story to tell. They all have a perspective 08: 39AM  
11 that's part of that faith.

12 When the State, via public education,  
13 asserts an answer to that question from a  
14 scientific, or whatever, point of view they  
15 have entered a religious arena. They are 08: 39AM  
16 offering an answer that may be in harmony, that  
17 may be conflict with religious issues,  
18 religious perspectives. And because of that we  
19 now have a religious issue being in the public  
20 education system. Now, I think part of our 08: 39AM

21 overall goal is to remove the bias of religion  
22 that is currently in schools.

23 We have an obligation we think to teach  
24 origin science in the most neutral way possible  
25 without religious bias, without naturalistic, 08: 39AM

0010  
1 or philosophical bias and that way we can do  
2 the best science and end up neutral with  
3 respect to the constitution. In order to  
4 accomplish that we require that all the data  
5 that's relevant to-- the scientific data that's 08: 40AM  
6 relevant to the issues of chemical evolution  
7 and macroevolution be put on the table. That  
8 the presentation of one side of that  
9 controversy data supporting one side of that  
10 controversy without presentation of data that's 08: 40AM  
11 contradictory to that hypothesis is not  
12 scientifically acceptable and also bias for  
13 discussion. So in a word our hope is that at  
14 the end of these hearings we will be allowed to  
15 teach the controversy that does exist over 08: 40AM  
16 origins.

17 We will also remove tension that's  
18 present in classrooms across the state to  
19 varying degrees. Parents have perspectives,  
20 teachers have perspectives, children have 08: 41AM  
21 perspectives, administrations have issues. And  
22 there is tension regarding this particular area  
23 like perhaps no other that needs to be  
24 resolved. And we think that our suggestion in  
25 the Minority Report will go a long way toward 08: 41AM

0011  
1 addressing that tension and allowing an open,  
2 evenhanded perspective on these issues.  
3 This is already-- the Kansas action  
4 actually is not the first to do this. Ohio a  
5 couple of years ago, the State of Ohio accepted 08: 41AM  
6 standards for their public education that  
7 allowed critical evolution-- excuse me,  
8 critical analysis of the evolutionary theory.  
9 I would note that there still is bio-science  
10 alive and well in Ohio, despite that event. 08: 41AM  
11 There are still graduate students in Ohio  
12 despite that.

13 The Minority Report does not introduce  
14 religion into this discussion. This is not to  
15 introduce creationism. Creationism, of course, 08: 41AM  
16 is a view of the fact the way it is  
17 traditionally held, a literal understanding of  
18 the first nine chapters of Genesis. That is  
19 not what we're interested in. I'm not  
20 interested in having a religious perspective 08: 42AM  
21 applied to science education. I just want the  
22 data to speak as it speaks. To my view the  
23 data are not clearly in support of the  
24 naturalistic world view.

25 The Minority Report does not mandate the 08: 42AM  
0012  
1 teaching of Intelligent Design. Intelligent  
2 Design is not a code word for creationism.  
3 Teaching the arguments against evolution is not  
4 a code word for creationism. It is simply good  
5 science education. At this point, however, we 08: 42AM

6 do not think it's appropriate to mandate the  
7 teaching of Intelligent Design. It's a fairly  
8 new science, it's a modern science of  
9 Intelligent Design, it's a maturing science and  
10 perhaps in time it would be there, but at this 08: 42AM  
11 point we think mandating it is inappropriate.

12 We do not, on the other hand, think that  
13 it should be forbidden that every student  
14 teacher feels interested or wants to bring up  
15 the issue didactically in a science setting, 08: 43AM  
16 that should be up to them and they should be  
17 allowed to do that, if they want to do that.

18 The strategy of our opponents has been to  
19 mischaracterize our position and actually to  
20 malign some of us who were presenting that 08: 43AM  
21 position. They have consistently and  
22 remarkably, in my mind, refused to engage in a  
23 discussion of the scientific substance of the  
24 issue. They continually avoid actually  
25 addressing the questions of the data regarding 08: 43AM

0013  
1 the origins of life experiments, the data  
2 regarding the difficulties, the actual -- in  
3 fact, it has never been shown that a single  
4 cell procreate can convert to a single cell  
5 ucreate. There is no mechanism known, but yet 08: 43AM  
6 that is the theory, that is the way it is  
7 taught, in fact, in school. The evidence does  
8 not support it and it disturbs me that we do  
9 not discuss the science, all we discuss is  
10 people's opinions. And sometimes those of us 08: 44AM  
11 who present in this position are characterized  
12 and labeled unfortunately.

13 The fact that this hearing is not going  
14 to be six days again is remarkable to me  
15 because the-- our opponents have three days in 08: 44AM  
16 which to spend to educate the citizenry of  
17 Kansas, to educate the Board on what the  
18 overwhelming evidence is for their position.  
19 They've chosen not to take that opportunity  
20 because in my view, this is just my opinion, 08: 44AM  
21 they are concerned that when held to the light  
22 of public scrutiny it will be clear that the  
23 emperor is not very well dressed.

24 Our opposition has chosen to fight this  
25 battle with name calling, ad hominem attacks 08: 44AM

0014  
1 instead of discussing science. Mr. Calvert, do  
2 you have a display I'd asked you to put up?

3 MR. CALVERT: Doctor Harris, I  
4 believe you provided copies of this to the  
5 members of the committee. 08: 45AM

6 MR. HARRIS: This is a posting on the  
7 Kansas Citizens for Science web site dated  
8 February 10th, 2005. It was written by Liz  
9 Craig, who is a member of that organization,  
10 and involves some of the public relation. It 08: 45AM  
11 is a discussion with someone named Pat, who I  
12 don't know who that is. In this discussion she  
13 points out what the strategy-- she says, "My  
14 strategy at this point--" of course, Kansas  
15 Citizens for Science is the organization 08: 45AM  
16 principally that's opposing our Minority

17 Report. "My strategy at this point is the same  
18 as it was in that 1999. Notify the national  
19 and local media about what's going on and  
20 portray them," not the media, the opponents, 08: 45AM  
21 "in the harshest light possible as political  
22 opportunists, as evangelical activists, as  
23 ignoramuses, as breakers of rules, as  
24 unprincipled bullies, et cetera," and I'm glad  
25 she stopped. "There may be no way to head off 08: 46AM

0015  
1 another science standards debacle, but we can  
2 sure make them look like asses as they do what  
3 they do. Our target is the moderates who are  
4 not that well educated about the issues." Not  
5 that well educated, we're talking about 08: 46AM  
6 education here. "Most of whom probably are  
7 theistic evolutionists. There's no way to  
8 convert the creationists."  
9 Our witnesses will be in front of you the  
10 next few days and you will be able to see and 08: 46AM  
11 hear for yourself and you will be able to  
12 judge. Are our witnesses political  
13 opportunists? I think not. They are  
14 advocating a point of view that about 80  
15 percent of the public in the United States 08: 46AM  
16 believes in. When polls have been taken about  
17 80 percent of those responding favor a balanced  
18 view, teach both sides, present all the data.  
19 Now, this country is not 80 percent one  
20 political party or another, so that's got to 08: 47AM  
21 include republicans and democrats. Is that me?  
22 Okay. So I don't think this is political  
23 opportunism. Are they evangelical activists?  
24 Well, some like myself do have a religious  
25 belief. All of us are descenders from 08: 47AM

0016  
1 Darwinism, some of us don't have religious  
2 beliefs. All of us are professional scientists  
3 who have really committed, as I think as most  
4 scientists are, to follow the evidence wherever  
5 it leads regardless of its religious 08: 47AM  
6 implications. That is the crux of science.  
7 Are we ignoramuses? Well, you'll have to  
8 decide. Are we rule breakers? Well, yes, we  
9 are. In a sense we are rule breakers. We are  
10 willing to break the unwritten rule of science 08: 48AM  
11 that says only natural explanations are  
12 allowed. The natural explanations are proven  
13 by scientific experiment to be inadequate and  
14 we are happy to break the rule and to follow  
15 the evidence where it goes. Are we 08: 48AM  
16 unprincipled bullies? The dictionary  
17 definition of a bully is a blustering,  
18 quarrelsome, overbearing person who habitually  
19 badgers and intimidates smaller and weaker  
20 people. Now, you may see some bullying these 08: 48AM  
21 next few days, you'll have to decide who is  
22 doing the bullying.

23 The motivation of our witnesses is to  
24 follow the evidence, to open up the study of  
25 the origins of nature to scientific 08: 48AM

0017  
1 explanations whether these are currently

defined as natural or not and that is what I hope we will accomplish.

MR. CALVERT: Thank you, Doctor Harris.

WILLIAM H. HARRIS, PhD,  
called as a witness on behalf of the Minority  
testified as follows:

DIRECT EXAMINATION

BY MR. CALVERT:

Q. Would you please describe to the committee and the public a bit about your background and professional experience?

08: 49AM

A. Yeah. I have a Ph.D. in nutritional biochemistry received from the University of Minnesota in 1978. I have an undergraduate in chemistry from Hanover College in Indiana. I went to high school in Prairie Village, Shawnee Mission East High School.

08: 49AM

My post doctoral work was done in the area of cardiovascular disease and nutrition at the Oregon Health Science University for four years with Doctor William Connor. After that I

08: 49AM

moved in the mid 1980s back to Kansas City to take a job at the University of Kansas Medical Center, the Department of Medicine doing-- running the lipid research laboratory there in the Division of Clinical Pharmacology. And in 1996 I moved to the University of Missouri, Kansas City in St. Luke's Hospital where I have the Daniel Lauer/Missouri Endowed Chair in Metabolism and Vascular Research. I also serve as the chairman of the ethics committee at our hospital.

08: 49AM

Q. Have you published papers?

A. I've published a few papers. I have published about 90 peer-reviewed studies in the medical literature.

08: 50AM

Q. What is your interest, can you tell us a little bit about what your focus is?

A. In my-- my day job?

Q. Yes.

A. Yeah, I thought I had a day job. My interest is in the prevention of heart disease by nutritional approach. My particular interest is in fish oils, omega-3 fatty acids. I've been a fan of omega-3 fatty acids for many years.

08: 50AM

08: 50AM

We have discovered I think in our research and others that higher levels of omega-3 fatty acids and fish in the blood are a profound risk factor for reduced risk for sudden cardiac death. And we are continuing our studies now to document that a blood test of omega-3 fatty acids should be added to cardiovascular risk panels just as they measure cholesterol and your triglycerides and LDL, they ought to measure your omega-3. It's a fantastic indicator of risk for heart attacks. That's what I do.

08: 51AM

08: 51AM



13 Q. Do you also supervise a laboratory that's  
14 engaged in that research?  
15 A. Right. My laboratory contains about 14 08: 51AM  
16 individuals. We do that type of research. We  
17 also do clinical trials in the area of lipids,  
18 diabetes, and metabolism for the pharmaceutical  
19 industry. We're currently conducting about 25  
20 studies in human volunteers. 08: 51AM  
21 Q. Have you received grant monies and so forth to  
22 support your research over the years?  
23 A. Yes. We receive-- of course, we receive from  
24 the pharmaceutical industry to do these  
25 clinical trials that are mandated by the FDA. 08: 52AM  
0020  
1 And I have received grants from the National  
2 Institute of Health, three grants to pursue my  
3 work on lipids and omega-3 fatty acids, and  
4 several smaller grants from the heart  
5 association and some foundations. 08: 52AM  
6 Q. And about what would be the total?  
7 A. Total dollars?  
8 Q. Uh-huh.  
9 A. Somewhere between three and four million.  
10 Q. And how-- if you were to put that on a scale 08: 52AM  
11 and you were to put on the scale all  
12 researchers, how would that--  
13 A. You mean--  
14 Q. -- compare?  
15 A. It's not bad. 08: 52AM  
16 Q. Could you tell us, Bill, if you had to describe  
17 your primary contribution to the work, the  
18 science you're doing now, what would that be?  
19 A. Well, I think my-- my work-- this is a bad  
20 joke. I'm a big fish in a little pond in the 08: 53AM  
21 area of fish research, fish oils. Having been  
22 in it since the late '70s I've-- I'm pretty  
23 much recognized as a world expert in the  
24 omega-3 world in cardiovascular health in that  
25 area. So I-- I'm doing really well in a really 08: 53AM  
0021  
1 small field.  
2 Q. Would it be fair to say that you're the  
3 inventor of a test, the omega-3, omegamatrix  
4 test--  
5 A. True. 08: 53AM  
6 Q. -- that actually allows somebody to measure the  
7 level of omega-3s in the blood and from that  
8 information have an appreciation for their  
9 relative risk for heart attack?  
10 A. Yeah, that's what I've done. 08: 53AM  
11 Q. Okay.  
12 A. Most recently.  
13 Q. How is that-- and I guess you're also lead  
14 guitarist and a singer in a band. Is that  
15 right? 08: 53AM  
16 A. You didn't say you were going to ask me that.  
17 I am part of a small rock and roll band, that's  
18 true. I did not bring enough CDs today.  
19 Q. Okay. And how many CDs have you produced?  
20 A. About 16. When you don't have to write the 08: 54AM  
21 music they go pretty fast just pirating, but we  
22 don't sell them, okay, so there's no copyright  
23 issues.

24 Q. Okay. What is it that caused you to develop a  
25 critical thinking about evolution, tell us 08: 54AM

0022

1 about that?

2 A. When I was in my graduate work I did my Ph.D.  
3 work at the Mayo Clinic in Rochester, at that  
4 time, pretty much through college and through  
5 my graduate work I was agnostic. I grew up 08: 54AM  
6 Presbyterian, but that didn't last past high  
7 school very well. And so when I got to college  
8 and undergraduate school I-- my faith lapsed  
9 rather quickly.

10 Later on in graduate school I met a girl 08: 55AM

11 who I was interested in. She was interested in  
12 taking classes in the bible. I thought, well,  
13 I haven't really looked at the bible since I  
14 was a teenager, maybe I ought to look at it and  
15 maybe get a little better look at her as well 08: 55AM

16 and ended up marrying her 27 years ago. But

17 through that experience I had, I think, a new

18 look at Christianity and I became a Christian

19 so my world view changed at that point. And

20 although I was not in my particular-- in my 08: 55AM

21 research I was not doing anything that had to

22 do with evolution, I was studying really what

23 almost all scientists study, which is what I

24 call operational science, how does the world

25 operate today, how does it work. Not where did 08: 55AM

0023

1 it come from, but how does it work. In that  
2 work I had no need for evolutionary theory or  
3 paradigm, so it never really occurred to me to  
4 think about it. But when my world view changed  
5 I started getting interested in looking. 08: 56AM

6 So I think my change caused me to get

7 interested in the topic of origins and I

8 started reading about it and began to see that

9 the-- what I thought was good evidence because

10 everybody believed it was tremendous leaps of 08: 56AM

11 faith that were being taken in the absence of

12 scientific data. And it began to strike me as

13 this is not the way you do science. When you

14 don't know, you say you don't know. You don't

15 make up a story and say that's the way it was. 08: 56AM

16 And so, you know, you start to get mad a little

17 bit when you see people messing with science.

18 In my own field in omega-3 I have that

19 same issue. People that I think misrepresent

20 the data to have it say what it does not say. 08: 56AM

21 So that's how I became interested mid '70s,

22 late '70s and didn't really do anything with

23 it, read some books became more engaged in the

24 early '90s when I read Phillip Johnson's book

25 "Darwin on Trial", then I read Mike Behe's 08: 57AM

0024

1 book, "The Biochemical Challenge to Darwinian

2 Evolution", I found that compelling and it made

3 less sense. And here we are.

4 Q. What was it about Phil Johnson's book that 08: 57AM

5 pricked your interest?

6 A. He-- I think he-- for me he made it very clear

7 that the science has become a naturalistic

8 philosophy. What I thought science was was

9 simply the unbridled search for the truth using  
 10 objective means, experiments, hypotheses, the 08: 57AM  
 11 things we all know is science. But it became  
 12 clear when it came to this area of Darwinian  
 13 evolution, particularly chemical evolution,  
 14 macroevolution, those two big pieces of  
 15 evolutionary theory, that there was a 08: 57AM  
 16 tremendous lack of data and the stories were  
 17 driven by a philosophy that said everything had  
 18 to have a natural explanation, you can't let  
 19 anything non natural get in. And I said we  
 20 don't know that, we don't know that's the truth 08: 58AM  
 21 and so it makes sense to me that you'd say we  
 22 don't know as Johnson points out in the academy  
 23 at higher levels of the universities, et  
 24 cetera, that this is taken as dogma and dogmas  
 25 have no place in science in my mind. 08: 58AM

0025

1 Q. Is there a name for that bias?  
 2 A. The fancy name is methodological naturalism.  
 3 And I have never counted the syllables, but I  
 4 don't want to say it again. I'll just call it  
 5 naturalism. Basically it's the use of-- the 08: 58AM  
 6 way it's typically presented is that scientists  
 7 use the methods of natural investigation. They  
 8 don't invoke spiritual forces to account for  
 9 what they observe in the world, they look for  
 10 natural causes. And that's fine to look for 08: 58AM  
 11 natural causes, but when you don't find any  
 12 natural causes it's time to fess up and say we  
 13 don't know instead of saying there was a  
 14 natural cause, we don't know what it was, we  
 15 have faith that's what happened. 08: 59AM  
 16 So methodological naturalism really puts  
 17 blinders, I think, on the search for truth,  
 18 particularly-- particularly in the area of  
 19 origin science.  
 20 Q. Why in the area of origin science? 08: 59AM  
 21 A. Because that's a historical science. It  
 22 doesn't get much more historical than billions  
 23 of years ago. Nobody was there to know what  
 24 happened. Nobody watched it. We cannot say  
 25 with any certainty how anything came to be. 08: 59AM

0026

1 They have every experiment particularly  
 2 in the origin of life field where they  
 3 attempted to use, quote, natural environments  
 4 to produce even some of the simplest chemicals  
 5 of life. They consistently failed. Since the 08: 59AM  
 6 1950s they have failed and failed and failed  
 7 and failed and yet they are still in the  
 8 textbooks presented as the plausible  
 9 explanation for how life arose. But those  
 10 experiments have failed. Dishonest in my view 09: 00AM  
 11 to portray failures in the laboratory as  
 12 successes in the textbook. So methodological  
 13 naturalism forces that view, in my  
 14 understanding.  
 15 Q. Does it effectively-- how does it affect the 09: 00AM  
 16 testimony of the evolutionary claim?  
 17 A. You can't test the evolutionary claim because  
 18 there's only one answer. In historical science  
 19 you have to have at least two possible

20 explanations for what you're trying to explain. 09: 00AM  
 21 How did that happen in the past? You have  
 22 looked for clues that are left over in the  
 23 present, recognizing-- and you should recognize  
 24 that you may not have all the relevant clues in  
 25 the present to make your decision about what 09: 00AM

0027  
 1 happened in the past. The clues you may have  
 2 are going to be incomplete; therefore, your  
 3 conclusion about what happened has got to be  
 4 tentative. And, again, you generally have two  
 5 competing hypotheses to explain what happened. 09: 00AM  
 6 Again, we're talking about origins, where  
 7 things came from. And if you have-- then you  
 8 look to see which the data supports better.  
 9 That's the way it typically goes. Of course,  
 10 there could be a third hypothesis you didn't 09: 01AM  
 11 even think of that is the truth, then you would  
 12 have missed it.

13 So if you have a naturalistic point of  
 14 view in applying to historical sciences, you  
 15 immediately eliminate the other option that 09: 01AM  
 16 some-- what we would now call nonnatural  
 17 process was involved. And we don't know that's  
 18 the case. But if you assume that from the  
 19 beginning you know where you're going to end up  
 20 before you even start. And, again, that's a 09: 01AM  
 21 philosophical restrictor around science--  
 22 historical science. I don't think this is  
 23 appropriate.

24 Q. How does that-- you explained how the rule  
 25 which affects the scientific conclusions, how 09: 01AM

0028  
 1 does it affect the religious issue?  
 2 A. If you only have one solution allowed to the  
 3 question of where did we come from and the  
 4 answer to that question is, in broad strokes,  
 5 we came by some naturalistic undirected, 09: 02AM  
 6 unguided process that essentially is an  
 7 accident. This has been clarified by Jacques  
 8 Monod, the Noble Prize winner, says man has to  
 9 understand he is merely an accident.

10 Now, I understand that many of us in this 09: 02AM  
 11 room may be accidents, but not in the sense he  
 12 was talking about. That view is a naturalistic  
 13 world view that presumes that undirected,  
 14 unplanned causes were at work from the very  
 15 beginning and what we have here today on earth 09: 02AM  
 16 is simply luck acted upon by law. It's just--  
 17 we're just lucky to be here. It's just a  
 18 chance thing.

19 Now, that, of course, is an explanation  
 20 for origins, where we came from, that I said 09: 02AM  
 21 religious-- you know, every religion has a  
 22 statement about, has a view about. They're not  
 23 all the same of course, but they all weigh in  
 24 on that issue. And if science weighs in with  
 25 a-- one perspective only, based on a philosophy 09: 03AM

0029  
 1 that says it had to be by natural processes,  
 2 otherwise it's not science, then they're  
 3 presenting data that's, I think,  
 4 philosophically driven, not scientific and data

5 driven. And so that's a problem and you run 09: 03AM  
6 into an immediate religious conflict.  
7 Q. Okay. I want to bring you back to--  
8 A. Could I get a drink of water while you think  
9 about that?  
10 Q. Sure. 09: 03AM  
11 A. That's the way water is going to work today,  
12 folks.  
13 Q. Doctor Harris, you are representing yourself  
14 and seven other authors of the Minority Report,  
15 are they-- would you like to introduce some of 09: 04AM  
16 your colleagues that are here today?  
17 A. Four of my colleagues that were able to come,  
18 Greg Lassey, raise your hand, Wayne Stringer,  
19 Dick Unruh, and John Yost. Thank you for  
20 coming guys. There are two others who could 09: 04AM  
21 not make it today, Rick Reeser was unable to  
22 come and Doctor Tim Crater had patients today  
23 so he could not make it.  
24 Q. Could you explain, you know, how you got  
25 involved in working on Kansas Science Standards 09: 04AM  
0030  
1 and a little bit about the process?  
2 A. I got involved in kind of a-- well, certainly  
3 not as directly as I am now, in 1999 when the  
4 board was considering science standards back  
5 then. I saw what was happening in the 09: 04AM  
6 newspaper, I decided I'd write a letter about  
7 my opinion that it really should be a balanced  
8 view, that we shouldn't eliminate by definition  
9 one perspective on origins. And through a  
10 series of events I ended up coming over to 09: 05AM  
11 Topeka, just down the road here, to one of the  
12 public comment times. I gave my two-minute  
13 talk right after you did, John, and then I left  
14 after my two-minute talk and you followed me  
15 out of the room and said we have some things in 09: 05AM  
16 common, let's talk. And at that point we-- you  
17 as a lawyer with a background in geology and me  
18 as a scientist, we thought we had something to  
19 bring to the table. So we, along with Jody  
20 Shogreen, who was a zoologist, who we also met 09: 05AM  
21 through the hearings, formed Intelligent Design  
22 Network and made some kind of Johnny come  
23 lately suggestions to the board regarding how  
24 we thought objectivity ought to guide science  
25 education. The horse was pretty well out of 09: 06AM  
0031  
1 the barn at that point. So our suggestions  
2 were-- generally fell on deaf ears.  
3 In 2001 we made some suggestions again  
4 following the same theme. So I got a little  
5 bit inculcated in this idea of science 09: 06AM  
6 standards back in 1999 and 2001. In 2004, in  
7 the summer, I was contacted by Mr. John Bacon  
8 from the State Board, asked if I would be  
9 willing to serve on a science writing  
10 committee. I said sure with some trepidation 09: 06AM  
11 knowing we'd end up here. And began-- that's  
12 where I met my colleagues here and 20 some  
13 other members of educators, scientists,  
14 professors around the state. We met in Salina  
15 on a monthly basis. 09: 06AM

16 And we began hammering through science  
17 standards and found that we really had quite a  
18 congenial time of it most of the time until we  
19 hit some rocky areas and this particular area  
20 here. I'd say probably 95 percent of the 09: 07AM  
21 standards we were in absolute harmony. It's  
22 this particular issue of origins and how it's  
23 to be presented has been a sticky point.  
24 I knew Doctor Jay Nicholson, who I forgot  
25 to mention is not here as well, he is the 09: 07AM  
0032 eighth member. I knew Jay from 1999. He was  
1 again on the science writing committee. As we  
2 got together and talked we found that we-- each  
3 of us knew other people who shared our views  
4 and that's how pretty much the eight of us came 09: 07AM  
5 together over time. Over several meetings we  
6 found that we agreed on how the origins ought  
7 to be presented and saw that we were a minority  
8 so we just began having discussions about how  
9 we can-- what proposals we can bring to the 09: 07AM  
10 table that would correct what we think were the  
11 deficiencies in the science standards as they  
12 were being proposed by the majority. So that's  
13 really how we came to be and we continued  
14 through that. 09: 07AM  
15 Q. Tell us a little bit about the way in which you  
16 processed your proposals.  
17 A. Well, our proposals began I think-- I guess  
18 you'd say they were actually born in 1999 when  
19 you and I and Jody and others looked at the 09: 08AM  
20 science standards at that time and made  
21 suggested changes. And that was somewhat the  
22 baby that came with me to the science standards  
23 meeting in 2004. And that was the framework  
24 around which we built and kept modifying and 09: 08AM  
25  
0033 addressing issues that came up.  
1 So the-- what we now call the Minority  
2 Report, at the time it was originally submitted  
3 we didn't know if it was a minority or not, but  
4 now we know it is. That report is simply a 09: 08AM  
5 collation of the specific pages out of the  
6 draft science standards that we would like to  
7 see changes in-- specific wording that we would  
8 like to see changes in and we just put that all  
9 together in one document and called it the 09: 09AM  
10 Minority Report and submitted it to the Board  
11 for their consideration.  
12 Q. Why did you submit it just to the Board?  
13 A. Just to the Board? We didn't actually just  
14 submit to the Board. Actually, we submitted it 09: 09AM  
15 to our science writing committee a number of  
16 times in a variety of forms. In written form  
17 in August and September and we submitted 25  
18 handout copies of our proposals. In October we  
19 submitted it as well. When the-- when it came 09: 09AM  
20 to the end of October there was a meeting on  
21 the 28th, I was out of town unable to be there,  
22 but my colleagues put into motion on the floor  
23 a motion to discuss formally at the committee  
24 level all the proposals that we've been 09: 09AM  
25  
0034

1 circulating. For procedural reasons the chair  
2 ruled that out of order and did not-- we did  
3 not get a vote on the Minority Report. The  
4 report-- at that point we had hoped to be able  
5 to find out if there were others that shared 09: 10AM  
6 our views, but without a vote we really  
7 couldn't know.

8 So eventually at the next meeting we went  
9 through it step by step and-- at the urging of,  
10 I think, this committee and discovered that, 09: 10AM  
11 yes, indeed in several of the cases we were a  
12 minority; some of the things we recommended  
13 were accepted.

14 Q. You mentioned that you formed Intelligent  
15 Design Network, and you are the managing 09: 10AM  
16 director of ID Net?

17 A. Yes.

18 Q. I want to show you, and I believe you handed to  
19 members of the committee, the brochure that ID  
20 Net has been using for the past four or five 09: 10AM  
21 years. And on the front of the cover is an  
22 image?

23 A. At least on your computer.

24 Q. There we go. Would you explain briefly what  
25 the mission of that organization is about? 09: 11AM

0035

1 A. Right. The mission of Intelligent Design  
2 Network has, from the beginning, been seeking  
3 institutional objectivity - emphasize  
4 objectivity and institutional - in origins  
5 science. The image that we use is simply a 09: 11AM  
6 balance. And the idea is to place the evidence  
7 for a design in one of the pans, place the  
8 evidence for undirected blind evolution or no  
9 design, which is essentially what evolution is,  
10 in this pan and see how the data weighs. And 09: 11AM  
11 don't come to the balance with any religious  
12 preconceptions, don't come with any  
13 naturalistic preconceptions, and simply let the  
14 data fall where they will and allow the  
15 implications to be as they are. So this 09: 12AM  
16 balance is objective. It's not got a-- one  
17 side should not be heavier than the other,  
18 that's the way we want it in science.

19 Institutional objectivity, everybody has  
20 their own personal bias and you can't get 09: 12AM  
21 around that. And scientists need to recognize  
22 their own biases and put them away when they're  
23 doing their work, but-- institutions of science  
24 too have biases. And public education is an  
25 institution, public science education is an 09: 12AM

0036

1 institution and we think it should not have any  
2 biases the way origins is presented. So that's  
3 what the institutional has to do with it.

4 Q. Why is it important for the institution to have  
5 no bias? 09: 12AM

6 A. Well, it's kind of like a-- kind of like a  
7 football game. The institution-- the school is  
8 like a football game. It appoints a teacher to  
9 be sort of a referee among ideas that he or she  
10 is going to present to classes in a variety of 09: 13AM  
11 different disciplines. And you've got-- if the

12 teacher is unable to-- or is biased toward one  
13 team or the other that's on the field, then  
14 you're not going to end up with a good outcome.  
15 Nobody would tolerate a football game where the 09: 13AM  
16 referee was obviously biased. In the same  
17 sense in origin science an institutional bias  
18 from the top can produce unsatisfactory  
19 results.  
20 Q. And this has, I think you testified, had an 09: 13AM  
21 unavoidable impact on religion?  
22 A. Yes.  
23 Q. Can you give us-- you've handed to the  
24 committee a copy of the Humanist Manifesto.  
25 Can you explain how the tenets of that religion 09: 14AM  
0037  
1 influenced or impacted the origin story that  
2 you showed on the scale, the design, no design  
3 image?  
4 A. Well, sure. The Humanist Manifesto-- this is 09: 14AM  
5 taken from the web site. Humanism is a  
6 progressive-- I don't remember it, let me read  
7 it. Progressive philosophy of life without  
8 supernaturalism. So it begins with the  
9 philosophy that there is no-- nothing beyond  
10 nature. So that's-- to me that's a bias that 09: 14AM  
11 you just begin with because you don't know that  
12 to be a fact, you just assume it to be a fact.  
13 So right away we're outside the realm of  
14 science here. We're not doing good science.  
15 They do say that-- things I am happy 09: 14AM  
16 with. The knowledge of the world is derived by  
17 observations, experimentation, and rational  
18 analysis. Absolutely. Couldn't agree more.  
19 Best method for it is using the knowledge to  
20 develop and help solve problems. 09: 14AM  
21 I think here's an interesting statement  
22 and this is-- again, this I think is a clear  
23 reflection of the fundamental point that humans  
24 are an integral part of nature, the result of  
25 an unguided, unplanned evolutionary process, 09: 15AM  
0038  
1 evolutionary change. This is foundation of  
2 current evolutionary theory.  
3 Many times I think it's-- evolutionary  
4 theory is presented to the public as meaning  
5 change over time and that's that and nobody has 09: 15AM  
6 any problem with change over time. Everybody  
7 agrees that change over time has happened. If  
8 that is all evolution is, the room would be  
9 empty. Unfortunately, evolutionary theory is  
10 not just that things changed over time, but 09: 15AM  
11 they changed over time by total accident.  
12 Everything that we see today simply showed up  
13 by the random interaction of matter and energy,  
14 law and luck. And that is how we all got here.  
15 That is what is at issue, that particular piece 09: 16AM  
16 of evolutionary theory. That is what we think  
17 children need to know is the definition of  
18 evolution. Not just that things changed over  
19 time because that's the part that's  
20 particularly contradictory. 09: 16AM  
21 Q. The manifesto is signed by a number of  
22 different people, could you point out anybody



23 in particular that's embraced this particular  
 24 philosophy that's relevant to the discussion?  
 25 A. Yeah, there are people that some folks 09: 16AM  
 0039  
 1 recognize, Richard Dawkins, a professor of  
 2 public understanding of science at Oxford, who  
 3 is a valid anti-- or valid evolutionist who  
 4 fights very hard against folks like us.  
 5 Anthony Flew is an interesting story. Doctor 09: 16AM  
 6 Flew is a philosopher of science who just last  
 7 month decided that he was going to follow the  
 8 evidence wherever it went and he decided that  
 9 he was not an atheist anymore. He wants his  
 10 name taken off, he's not an atheist, he's not a 09: 17AM  
 11 theist. He says I don't believe in that  
 12 personal God stuff, but he said the evidence of  
 13 design and makeup of the world is overwhelming  
 14 and I can no longer say that this just happened  
 15 by chance. 09: 17AM  
 16 Eugenie Scott, is also-- she's the  
 17 director of the National Center for Science  
 18 Education. She is an-- I guess one of the  
 19 leaders of the opposition to our point of view.  
 20 She is a signator of that document. 09: 17AM  
 21 Q. Did Mrs. Scott have any input in the Kansas  
 22 science standards?  
 23 A. Mrs. Scott did have some input to the Kansas  
 24 science standards. I did not know this-- of  
 25 course, it was not made clear to anybody at the 09: 17AM  
 0040  
 1 meetings, but it was interesting when draft two  
 2 was sent out to the full committee for us to  
 3 see what the final document was there were  
 4 buried-- you know, if you turn on your track  
 5 changes, turn on your comments, buried in the 09: 18AM  
 6 document in draft two of the science education  
 7 standards.  
 8 Q. This is the March 9, 2005 draft?  
 9 A. Right. If you look here, mission statement--  
 10 we're in the mission statement area. If you'll 09: 18AM  
 11 hover your mouse-- you know, how this works, if  
 12 you hover your mouse over a comment and the  
 13 person who made the comment-- on whose computer  
 14 the comment was made, I will not say Eugenie  
 15 Scott necessarily made these comments, but 09: 18AM  
 16 somebody got access to her computer and made  
 17 comments on this document. This phrase is a  
 18 good one to retain from the 2001 standards as  
 19 remains useful if the ID'ers make a move.  
 20 That's us, we're the ID'ers. And there are 09: 18AM  
 21 several other yellow spots. There are about  
 22 nine comments that are in this document that  
 23 have Eugenie Scott's fingerprints on them. So  
 24 she does have input in the science standards of  
 25 Kansas. While you're thinking I'm going to get 09: 19AM  
 0041  
 1 more water.  
 2 Q. Doctor Harris, would you-- we heard about  
 3 Intelligent Design and it's discussed in this  
 4 debate and although the Minority Report does  
 5 not propose that that concept be taught or 09: 20AM  
 6 tested, it is relevant because the Minority  
 7 Report suggests that it is an idea that should

8 not be prohibited?  
9 A. Correct.  
10 Q. Would you explain why you believe-- what it is 09: 20AM  
11 that you believe should not be prohibited?  
12 A. Well, what is basically Intelligent Design?  
13 Q. Yes.  
14 A. Well, I guess at it's core, the way that I  
15 would describe it, is sort of by contrast. In 09: 20AM  
16 my view, and I think this is true, evolution  
17 really is a claim-- evolutionary theory or  
18 Darwinian evolutionary theory is a claim that  
19 all the apparent design in life, and most  
20 everybody recognizes that things look like 09: 20AM  
21 they're designed, but that it is only apparent,  
22 that it is only an illusion, that really law  
23 and luck, chance and chemical interactions are  
24 really responsible for all this what looks like  
25 design, but it really isn't design. A design 09: 21AM  
0042  
1 has intent and purpose and it's put together in  
2 forethought. That's a long definition.  
3 Intelligent Design is simply a scientific  
4 disagreement with that respect.  
5 Q. And what's the disagreement based on? 09: 21AM  
6 A. Data.  
7 Q. What is the data?  
8 A. There's a tremendous amount of data in  
9 scientific literature, particularly in  
10 biochemistry, but also in cosmology and many 09: 21AM  
11 other places, that points-- that has identified  
12 I think certainly since 1953 when DNA-- the  
13 code was cracked by Watson and Crick, what  
14 they-- Watson and Crick discovered was a code.  
15 They discovered a code. Every other code in 09: 21AM  
16 the world that we know of came from a mind. To  
17 conclude that DNA at some level somewhere  
18 originally came from a mind is not an  
19 irresponsible deduction from the data.  
20 When we look at some of the biochemical 09: 22AM  
21 machines that are in cells and some of our  
22 witnesses will attest to this and maybe even  
23 show some pictures and how we understand that  
24 some of these fantastically complex machines  
25 that work inside the simplest cell, we can see 09: 22AM  
0043  
1 them now, we understand them now. The advanced  
2 and modern molecular biology has shown us a  
3 world that can only be explained, in my view,  
4 by depositing some kind of plan in a direction.  
5 I don't know who did it. I don't know how it 09: 22AM  
6 was done. I don't know why it was done. I  
7 don't have to know any of that stuff to detect  
8 design.  
9 If I walked into my garage today and I  
10 found a six-foot bacterial flagellin laying 09: 22AM  
11 there and spinning at 100,000 RPM I would have  
12 no idea what it was, but maybe my weed whacker  
13 going nuts, but I would have no question in my  
14 mind it was a designed object. I would just  
15 have no idea what it was. You can infer design 09: 23AM  
16 just by examining something without knowing  
17 anything about where it came from.  
18 Q. Does an inference of design entail a belief in

19 a supernatural?  
20 A. Of course not. Of course not. Everything you 09: 23AM  
21 see in this room was designed by an  
22 intelligence for a purpose, that's not  
23 supernatural. We're talking about-- where  
24 supernatural comes into it is when we're  
25 talking about prehistory, origins, where did we 09: 23AM  
0044  
1 come from. As far as we know there wasn't any  
2 intelligence there. So in that situation you  
3 don't know if there was intelligence involved  
4 by direct observation. All you can do is look  
5 at the effects of what were left behind. In 09: 23AM  
6 the same way that an archaeologist finds a  
7 stone and says is this a tool or is it a rock.  
8 They're looking for an inference to design  
9 based on the data without knowing anything  
10 about the originator of that artifact. 09: 23AM  
11 The same way in biology, bringing that  
12 same thinking mentality into biology when we  
13 find what looked like designed objects. To me  
14 the onus is on those who would say it is not  
15 designed, let me show you how that can happen 09: 24AM  
16 by data, by scientific experiment let me show  
17 you how that can happen without any plan.  
18 That's great. When I see the data I'll believe  
19 it. Until that happens the onus is on them to  
20 show us, otherwise all natural inferences 09: 24AM  
21 should be made.  
22 Q. Will science ever be able-- from a scientific  
23 standpoint ever be able to prove that life was  
24 designed or not designed?  
25 A. No. You can't prove anything that happened in 09: 24AM  
0045  
1 history. You can only find the inference to  
2 your-- the best explanation you got and hold it  
3 tentatively. If all the data in the world went  
4 that direction, it still would not prove that's  
5 what happened. 09: 24AM  
6 Q. So ID is simply a scientific inference that  
7 competes against another one?  
8 A. Right.  
9 Q. Yes?  
10 A. Yes. A materialist inference, right. 09: 24AM  
11 Q. Okay. What do you mean by the word "prove"?  
12 A. What do I mean by the word "prove"? You really  
13 can't even do that in science. You can't-- you  
14 can reach a consensus of the data that is  
15 overwhelmingly compelling that cannot be 09: 25AM  
16 explained any other way and that's probably as  
17 close as we got in operational science to  
18 proving. I mean, I can't really prove gravity  
19 to us, but it seems to work every time I try  
20 it. So prove-- if you're going to be 09: 25AM  
21 philosophical -- and we certainly have  
22 philosophers of science who will be up here you  
23 can ask that question to.  
24 Q. How do you differentiate science from religion?  
25 A. Well, religion is fundamentally based on dogmas 09: 25AM  
0046  
1 that are unquestionable. One just accepts the  
2 view of whatever religion you're talking about  
3 and says that's the way it is. And data is, to

4 some extent, irrelevant.

5 Q. So when we go to the section of Humanist 09: 25AM

6 Manifesto we were looking at dogmas there,

7 right?

8 A. Yeah, sure. If you assume from the outset

9 there's no supernaturalism, well, that's an

10 assumption, that's dogma, that's not proven. 09: 25AM

11 Q. And I think you previously mentioned in your

12 opening about why you don't believe it's

13 appropriate to include it in the standards now?

14 A. Yes, I did. I think it's-- I think it's still

15 a developing, maturing field that needs to be 09: 26AM

16 flushed out. There's no curriculum developed

17 for it at this point. There's just a lot of

18 infrastructure I think that needs to be put

19 together. The inference is obvious to me. I

20 mean, it's very simple. But the way you 09: 26AM

21 actually get it into the science standards and

22 then get it in the classrooms, there's a

23 tremendous amount of work that's involved

24 there. I don't think we're ready to do that at

25 this point. 09: 26AM

0047

1 Q. Doctor Harris, what I want you to do is to

2 explain to the committee and the public the

3 work that-- go through the proposals in the

4 Minority Report. And then also I believe that

5 there were 12 scientists that submitted a-- 09: 27AM

6 reviews of those proposals and I would also

7 like you to talk about that. And I believe

8 you've handed to the committee an exhibit that

9 perhaps will aid your presentation and I will

10 turn the pages as you direct me. 09: 27AM

11 A. This will not perhaps help us, it will be a

12 tremendous help. And this is part of the

13 necessary beginning of this thing to layout

14 what the actual proposals in the Minority

15 Report are without reading all 19 pages of it, 09: 27AM

16 which many of you have. So I have in this

17 table an overview. Over here is the section of

18 the report where it's found, introductions.

19 This will be grade 8 through 12, S standards

20 for standard, B-M standards for benchmark, so 09: 27AM

21 this is where they are in the standards. This

22 is the issue summarized and then this is a

23 brief description of the issue that we've

24 raised.

25 The first issue that we've recommended is 09: 28AM

0048

1 that in the mission statement the word

2 "informed" be added. That we would aim to

3 equip students to make informed and reasoned

4 decisions. The current standards say equip

5 students to make reasoned decisions. I think 09: 28AM

6 that if a decision is poorly informed, it's not

7 going to be well-reasoned. And you can come to

8 the wrong conclusion if you haven't got good

9 information. We asked that these two words

10 "informed" and "and" be added to the standards. 09: 28AM

11 The committee voted it down. Which totally

12 amazed me, but they did it.

13 Okay. Secondly, we proposed to replace a

14 naturalistic definition of science, which was

15 instituted in 1999 in Kansas, with a more 09: 28AM  
16 traditional definition that we've taken from  
17 the Ohio Academy of Science that was approved  
18 by that state board of education. And that one  
19 I can't do from memory, but I think I need to  
20 read. The current standards read that science 09: 29AM  
21 is the human activity of seeking natural  
22 explanations for what we observe in the world  
23 around us. We would suggest that change to  
24 science is a systematic method of continuing  
25 investigation that uses observations, 09: 29AM  
0049  
1 hypothesis testing, measurement,  
2 experimentation, logical argument, and theory  
3 building to lead to more adequate explanations  
4 of natural phenomenon. That is the  
5 recommendation that we would make that that 09: 29AM  
6 definition be put in. We have been accused of  
7 challenging the very foundation of science by  
8 proposing such a radical unheard of definition.  
9 And it just amazes me that anybody would think  
10 that's not a definition of science. That's 09: 30AM  
11 what I've been doing for 25 years and that's  
12 what it is.  
13 The third point, permit critical analysis  
14 of controversial issues. Here this is in the  
15 introduction, this is embodied in the 09: 30AM  
16 Sanatorium amendment, this was based by the  
17 U.S. Senate and included in the No Child Left  
18 Behind conference report. This is language  
19 that suggests that-- or actually that directs--  
20 I can't do that one by memory either. The 09: 30AM  
21 conferees recognize - and this is the language  
22 like in the introduction - that a quality  
23 science education should prepare the students  
24 and distinguish the data and testable theories  
25 of science from religious or philosophical 09: 30AM  
0050  
1 claims that are made in the name of science.  
2 Where topics are taught that may generate  
3 controversy, such as biological evolution, the  
4 curriculum should help students to understand  
5 the full range-- the full range of scientific 09: 30AM  
6 views that exist, why such topics may generate  
7 controversy, and how scientific discovery can  
8 profoundly effect society. And we would ask  
9 that that language be put in in a sense of the  
10 Kansas standards that we agree with that 09: 31AM  
11 attitude.  
12 Number four, acknowledge major unanswered  
13 questions. There are many unanswered questions  
14 in science. We think it's important that  
15 students recognize that science is not a closed 09: 31AM  
16 book, that there's nothing left to do, that  
17 there are many things that are challenging and  
18 these are indeed questions on origin of the  
19 universe-- origin of the fundamental laws of  
20 the universe. Where did gravity come from, 09: 31AM  
21 where did the mass electrons come from, where  
22 life came from, where the diversity of life--  
23 these are deep questions that still need to be  
24 answered. Science has no good answer for them  
25 at this point. 09: 31AM

0051

1 Eighth grade, evolution is a theory here.  
2 There has been some effort to remove the word--  
3 and successful effort I may add, to remove the  
4 word theory from biological evolution and we  
5 think it's clear that evolution-- Darwinian 09: 32AM  
6 evolution, macroevolution, and chemical  
7 evolution, which, of course, is not part of  
8 Darwinism, but it is part of the greater  
9 overarching spectrum. Those are theories and  
10 need to remain as theories. To teach them as 09: 32AM  
11 fact is irresponsible.

12 Eighth grade historical sciences.  
13 Children need to understand that there is a  
14 fundamental difference between the conclusions  
15 we draw from historical science, where do 09: 32AM  
16 things come from, how did things come to be,  
17 versus what we'll call, for lack of a better  
18 word, operational or maybe experimental  
19 empirical sciences where many of the-- most of  
20 the variables are controllable and they operate 09: 32AM  
21 in the real world today. So historical  
22 sciences are very different than operational  
23 sciences and students need to understand it.

24 Institutional bias, we discussed that  
25 bias can exist in institutions. We recommend 09: 32AM

0052

1 teaching historical sciences a little bit more  
2 in-depth at the higher grades. Nucleotide  
3 sequence is not determined by-- are you trying  
4 to tell me something, John?

5 Q. Oops, excuse me. 09: 33AM

6 A. It's fine if you want me to-- I'm sorry. We  
7 have-- in serving the area of genetics that the  
8 nucleotide sequence, sequence of the basis in  
9 DNA, is not determined by any robot. That is a  
10 profound mystery. The language-- the 09: 33AM  
11 information carried in a DNA molecule is  
12 something that cannot be explained by the laws  
13 of chemistry and physics. Where do you get  
14 information in biology is a deep unsolved  
15 question that is fundamental to biology. 09: 33AM

16 Definition of evolution. We want to make  
17 it clear that the true definition of Darwinian  
18 evolution turns upon the question of it being  
19 planned guided or unguided-- excuse me, an  
20 unguided process. It's not-- and any view of 09: 33AM  
21 evolution that causes a guiding, whether it's a  
22 long time or a short time, is a-- I think an  
23 intelligent design perspective, it is not a  
24 Dawinistic or materialistic perspective.

25 We have a minor clarification here 09: 34AM

0053

1 regarding natural selection genetic drift. We  
2 have a formatting problem that needs fixed.  
3 Random mutations are usually deleterious. We  
4 want to make it clear that the beneficial  
5 mutations that are the base of the Darwinian, 09: 34AM  
6 macroevolutionary theory are exceedingly rare  
7 and that is not perhaps as clear as we would  
8 like to make it and so we've added this.

9 Whether you can extrapolate the micro  
10 evolutionary process to macroevolution is a 09: 34AM

11 huge leap of faith in my view for scientists  
12 and it needs to be made clear that we cannot  
13 yet make that claim. Microevolution is a  
14 wonderful research perspective. It is a  
15 scientific theory that is working well. All of 09: 34AM  
16 us agree and understand that microevolution  
17 works tremendously well. That is the part of  
18 evolution-- we say evolution is essentially for  
19 agriculture and medicine for bio-science. When  
20 you hear that evolution is essential to those 09: 35AM  
21 things, what they're talking about is  
22 microevolution. Whether we arrived-- let's  
23 see, how we came to be is irrelevant to  
24 agriculture, it's irrelevant to medicine. How  
25 do genes work and how bacteria can mutate in 09: 35AM

0054

1 response to different environments, that is  
2 relevant to medicine today and that is  
3 microevolution.  
4 Common ancestry, a fundamental role or a  
5 tenet in Darwinism. Students learn that there 09: 35AM  
6 is some evidence that's inconsistent with that  
7 theory. They need to hear that if they're  
8 going to make an informed decision. Similarly  
9 with origin of life. There's no comment in the  
10 current standards about origin of life. That 09: 35AM  
11 is the beginning of biology, that is the basis  
12 for all of us. Why would we not talk about it?  
13 We don't talk about it because we haven't got a  
14 natural explanation for it, so it's not in the  
15 standards. But it is in the textbooks in 09: 36AM  
16 spades. And the naturalistic scenario is laid  
17 out for the children to see even though the  
18 evidence is extremely weak and contradictory.  
19 Children need to know it. This is teaching  
20 part of the controversy. Understanding does 09: 36AM  
21 not mandate belief. This is in a teacher note.  
22 Use of scientific knowledge. These are not  
23 powerful or terribly important.  
24 UNIDENTIFIED SPEAKER: Doctor Harris,  
25 you have two minutes. 09: 36AM

0055

1 A. Thank you. Next slide. This is a chart, John,  
2 you mentioned that there were 12 individuals  
3 who wrote critiques of the draft of the  
4 Minority Report. I have given here the issues  
5 that they were concerned about, the names of 09: 36AM  
6 the individuals. And if there's a red dot they  
7 disagreed, if there was a yellow dot there was  
8 some ambivalence, if this was a green dot they  
9 generally agreed with the perspective we have  
10 there. As you can see most of the squares are 09: 37AM  
11 filled with nothing. No comment on most of our  
12 comments. The predominant color there is red  
13 meaning disagreement.  
14 I've had 90 papers in the peer review  
15 literature. I know what peer review is. I 09: 37AM  
16 peer review papers. I don't come with a bias  
17 to a paper that I'm asked to review. These  
18 individuals were advocates, in my view. They  
19 were here to write bad things about this. The  
20 folks who sent them the draft knew their 09: 37AM  
21 opinions already and they were asked to

22 criticize, not to evaluate objectively. So I  
23 don't take much of this--  
24 Q. Doctor Harris, can I interrupt just a second.  
25 MR. CALVERT: The time keeper I 09: 37AM  
0056  
1 believe is clocking this at 60 minutes, but  
2 actually Doctor Harris, because he took the ten  
3 minutes for the opening remarks, has 70 minutes  
4 and that would give Mr. Irigonegaray 35 minutes  
5 and would give you guys about 15. And I think 09: 38AM  
6 that if Doctor Harris concludes his remarks at  
7 a quarter to ten we'll be able to satisfy that.  
8 UNIDENTIFIED SPEAKER: No problem.  
9 Time is noted.  
10 A. The next slide, please. Just a few examples of 09: 38AM  
11 internal contradictions among these reviewers.  
12 I have just two or three examples of  
13 individuals who-- this guy thought this and  
14 that gal thought that.  
15 Next slide, please. Just to outline 09: 38AM  
16 briefly what these are. Under adding informed  
17 to the mission statement, Doctor Hurd said it  
18 creates several errors and hazards. Now, you  
19 let me know what you think the hazards of  
20 adding the word informed to the mission 09: 38AM  
21 statement. Doctor Heppert said this proposed  
22 change is fine. Acknowledges major unanswered  
23 questions. Doctor Wiley said certainly we know  
24 the actual causes of the origin of all the  
25 fundamental laws. I think that's fantastic. 09: 39AM  
0057  
1 We know the actual causes. And then Doctor  
2 Edis comments, there is no settled answer to  
3 these questions. Well, okay, I might be a  
4 little more inclined to believe that.  
5 Eighth grade historical science. Should 09: 39AM  
6 we teach historical science? Doctor Bartlett  
7 says great idea. Doctor Thiebold and other  
8 says there's no difference between historical  
9 and experimental science so don't bother with  
10 it. Then there's this on nucleotide sequence 09: 39AM  
11 is not determined by any one known law. Doctor  
12 Miller says, well, of course, nobody has ever  
13 suggested otherwise. So in a sense he agrees.  
14 I mean, he doesn't agree with anything we've  
15 talked about, but he said there's no 09: 39AM  
16 disagreement. Everybody knows that nucleotide  
17 sequence is not determined by law, except  
18 Doctor Brand and Doctor Wiley who say, yeah,  
19 sure the nucleotide sequence we know that there  
20 are-- he says, sure, there are laws, we 09: 40AM  
21 understand them. Doctor Wiley says, however,  
22 the order of the nucleotide basis is governed  
23 by biological laws. I don't know what those  
24 are, but he seems to think there's law.  
25 Next slide. I believe we may be-- we're 09: 40AM  
0058  
1 not going to go over every individual. I'm  
2 done with that section.  
3 Q. Doctor Harris, during your work and the work of  
4 the authors of the report, were you successful  
5 in getting some changes accepted? 09: 40AM  
6 A. Yeah, there were several things that over the



7 season from the summer time to Christmas we, I  
8 think, were able to get in and you have a list  
9 of them here. Just quickly, there was a-- we  
10 were able to get the elimination of the 09: 40AM  
11 implication that was found in the fourth grade  
12 benchmark that implied that natural phenomenon,  
13 which included living systems, lacked the  
14 attribute of design. That's what made them  
15 natural, they didn't have design. So we got 09: 41AM  
16 rid of that and I think that's important.  
17 We deleted the reference to the natural  
18 world as being only a material world because  
19 material world does not adequately explain the  
20 natural world. The natural world involves 09: 41AM  
21 things like biological information and  
22 consciousness, which are not material objects.  
23 Indicators which encourage students to  
24 understand personal bias and preconception, we  
25 were able to add that. 09: 41AM  
0059  
1 And the important one that has a lot of  
2 implications, able to get a comment in, that  
3 the role of teachers is to reinforce normative  
4 parental and legal expectations regarding  
5 unhealthy adolescent behaviors instead of 09: 41AM  
6 letting kids make their own decisions about  
7 their health and everything else irregardless  
8 of what their parents or teachers might have to  
9 say about it.  
10 Remove the suggestion that human behavior 09: 41AM  
11 may be due to natural selection rather than  
12 choice. Humans make choices and it's not  
13 because nature made me do it it's because we  
14 made choices. Revision of introduction to  
15 eliminate a mechanism that would suppress 09: 42AM  
16 students discussing questions deemed by the  
17 teacher to be outside the realm of science  
18 because we don't know what the realm of science  
19 is.  
20 These are other proposals that did not 09: 42AM  
21 get in draft two that did receive significant  
22 support when we had our vote in November.  
23 Students understand institutional bias may  
24 affect explanation. There were 14 in favor of  
25 that one and three against it, six abstentions, 09: 42AM  
0060  
1 this did not pass because the chair ruled that  
2 this is not a two-thirds majority.  
3 The definition of science that we  
4 proposed here. The vote was 10 for it 12  
5 against it and one abstention. So there was 09: 42AM  
6 more than usual support for that.  
7 Q. Why do you think the Board should adopt the  
8 ideas in the Minority Report?  
9 A. I think for three reasons. Number one, I think  
10 it's good science. I think it is good didactic 09: 42AM  
11 science. We need to teach kids to take the  
12 data regardless of its philosophical  
13 implications, follow the data where it leads,  
14 then we're going to make good science. If we  
15 have-- put blinders on them and say you can 09: 43AM  
16 only look over here and you must find an  
17 explanation in that box, that's not good

18 science. And that box might be a religious box  
19 and I don't-- that's not the way to do it  
20 either. You don't have philosophical bias, you 09: 43AM  
21 don't have a religious bias that the data all  
22 has to fit into. That's good science. Number  
23 one-- I think it's-- I'm not a lawyer and you  
24 told me, and I believe it, the Constitutional  
25 neutrality will be served by presenting both 09: 43AM

0061

1 sides of the view.  
2 Q. By doing good science?  
3 A. Exactly. When you do good science you get--  
4 you remove the concern about bias and you bring  
5 neutrality to public education. And then it 09: 43AM  
6 also removes this tension that is present among  
7 teachers and parents and kids about how we're  
8 going to teach this. It lays it all out, just  
9 teach the data and move on.  
10 Q. Thank you very much, Doctor Harris. 09: 43AM

11 MR. CALVERT: We don't have any  
12 anything further to present with this witness.  
13 He's open to questions.

14 THE WITNESS: I'm going to get a  
15 drink. 09: 44AM

16 CHAIRMAN ABRAMS: Just a moment,  
17 please. Mr. Irigonegaray, you have 32 minutes.

18 MR. IRIGONEGARAY: Could you clear  
19 the board, please?

20 MR. CALVERT: Sure. 09: 44AM

21 CHAIRMAN ABRAMS: Doctor Harris, if  
22 you would like to-- if you want to get a drink  
23 or-- he needs a moment to organize his thoughts  
24 he said, so if you'd like to get a drink now  
25 would be an opportune time. 09: 44AM

0062

1 THE WITNESS: I'll get another drink.

2 CROSS EXAMINATION

3 BY MR. IRIGONEGARAY:  
4 Q. Sir, I have only a few questions for you. As  
5 it was stated earlier, my name is Pedro 09: 46AM  
6 Irigonegaray, I represent the majority. You've  
7 told us a little bit about your beliefs and  
8 your opinions and how you came to those. I'd  
9 like to ask you for the record, first, can you  
10 tell us how old you believe the earth is? 09: 46AM

11 A. I don't know. I think it's probably really  
12 old.

13 Q. How old is really old?

14 A. I don't really know.

15 Q. You have no idea how old the earth is? 09: 47AM

16 A. There's theories around that the earth is  
17 10,000ish years old. There are theories around  
18 that it is four billion years old. If it was a  
19 multiple choice test and I only had two choices  
20 and I couldn't check "I don't know," and I 09: 47AM  
21 wanted to get credit for the question, I'd  
22 check old.

23 Q. I understand, sir. But in all the work you  
24 have done, in all the research that you have  
25 done, in all your experience to this day you 09: 47AM

0063

1 still don't have an opinion as to how old the  
2 earth is?

3 A. I have an opinion, I just don't really know.  
4 My opinion is it's probably fourish billion  
5 years old. 09: 47AM  
6 Q. Four billion years old. All right. Would you  
7 specifically tell us, sir, where specifically  
8 in the standards is the term "humanism"  
9 mentioned?  
10 A. It's not in the standards. 09: 47AM  
11 Q. Where in the standards is the term "naturalism"  
12 mentioned?  
13 A. Naturalism? I don't know that it is mentioned,  
14 I think that's part of the problem.  
15 Q. You don't know if it's mentioned? 09: 48AM  
16 A. I can't think of a place. Natural is mentioned  
17 a lot. Naturalism I don't think is mentioned.  
18 Q. The fact is it's not mentioned at all,  
19 correctly-- correct?  
20 A. I think that's true. 09: 48AM  
21 Q. You know that's true, don't you?  
22 A. That's a lot of words there. I couldn't-- I  
23 would say it probably is not there.  
24 Q. Would you care to take the time to find whether  
25 or not it's there or-- 09: 48AM  
0064  
1 A. If you wouldn't mind if I took 32 minutes to do  
2 that, that would be fine.  
3 Q. Or are you comfortable with the opinion that  
4 that term is simply not there?  
5 A. Yeah, I'm comfortable with that. 09: 48AM  
6 Q. Where in the standards does it say that  
7 teachers and students cannot discuss criticisms  
8 of evolution?  
9 A. It doesn't say that. I think it's implicit in  
10 the way-- in the language that presents 09: 48AM  
11 evolutionary theory, particularly the two  
12 aspects, macroevolution presented as a fact as  
13 --not as a theory and that's what I think opens  
14 the door to that.  
15 Q. You then would have to agree, would you not, 09: 49AM  
16 sir, that nowhere in the standards are teachers  
17 and students denied the opportunity to discuss  
18 criticisms of evolution?  
19 A. Correct.  
20 Q. If this is all about science and not about 09: 49AM  
21 philosophy or religion why do you keep bringing  
22 up atheism, materialism, naturalism, and  
23 humanism to this argument?  
24 A. Well, in my remarks I said it's not all about  
25 science. This is a scientific controversy that 09: 49AM  
0065  
1 has powerful theistic implications. So it's  
2 not all about science. It's-- the core is  
3 about science, but there is a penumbra, there's  
4 an umbrella out here that's philosophical and  
5 religious and that's where it comes in. 09: 50AM  
6 Q. You would agree, would you not, that the  
7 purpose of science or the guiding light for  
8 science should be neutrality as it deals with  
9 faith?  
10 A. Exactly, yes, neutrality. 09: 50AM  
11 Q. You would agree with science should not involve  
12 itself with accepting a particular theistic  
13 view, but rather to use the rigorous scientific

14 process to search for answers?  
15 A. Or atheistic view. 09: 50AM  
16 Q. Where in the standards do you find any  
17 reference to atheistic views to be the practice  
18 in the state?  
19 A. I don't find them written explicitly in the  
20 standards. 09: 50AM  
21 Q. Are you aware that there are many people,  
22 millions of people throughout the world that  
23 believe that God acts through natural process  
24 and that science does investigate the natural  
25 process and that it is not incompatible for 09: 51AM  
0066  
1 someone to be both a scientist and a religious  
2 person?  
3 A. Yeah, I'm aware there are a lot of people like  
4 that.  
5 Q. Not a problem with that? 09: 51AM  
6 A. Well, I have-- I think they don't understand  
7 evolutionary theory very well. And I think the  
8 position that God invented evolution to make  
9 all of this is a faith statement, it's not a  
10 scientific statement. 09: 51AM  
11 Q. Where do the science standards say anything  
12 about unguided or undirected?  
13 A. That's the problem, they don't.  
14 Q. So you're suggesting that because the standards  
15 don't say that, that is a problem? 09: 52AM  
16 A. That's why we're-- that's why we asked that it  
17 be added because that is the fundamental theory  
18 and it needs to be exposed and it needs to be  
19 disclosed.  
20 Q. Whose fundamental theory is it? 09: 52AM  
21 A. Well, I could read some quotes from  
22 evolutionary biologists who write textbooks  
23 that say it is a completely unguided process.  
24 Q. Referring to the science standards?  
25 A. No, the science standards do not say that. 09: 52AM  
0067  
1 Q. And that's what this is about is science  
2 standards?  
3 A. Exactly. It's what's left out of the science  
4 standards.  
5 Q. Should science be involved with the process of 09: 53AM  
6 attempting to ascertain how the natural world  
7 around us functions?  
8 A. Yes.  
9 Q. And is it your opinion that it is appropriate  
10 to teach students supernatural answers for that 09: 53AM  
11 process in the science curriculum?  
12 A. No.  
13 Q. So you would agree with me that supernatural or  
14 miraculous explanations should not be allowed?  
15 A. Not in science education. 09: 53AM  
16 Q. Would you suggest that any time that we don't  
17 have a natural explanation, we ought to stop  
18 looking for it and invoke a miracle?  
19 A. No. If we don't have a natural explanation we  
20 can keep looking for it, but there has got to 09: 54AM  
21 come a point, just as it came with the  
22 alchemists of the middle ages when someone said  
23 enough is enough, we're not going to make gold  
24 out of lead. If you have discovered via

25 experimentati on that your hypothesis is 09: 54AM  
0068  
1 supported you're meandering.  
2 Q. And is it your position that evolution is just  
3 simply not supported by the evidence?  
4 A. My position is that microevolutionary theory is  
5 very well supported by the evidence. 09: 54AM  
6 Q. Your position--  
7 A. Macroevolution theory is not well supported by  
8 the evidence. One can build the story, but the  
9 evidence, I think, is lacking for a firm  
10 conviction. 09: 54AM  
11 Q. You talked earlier about bias. Is it your  
12 opinion that the American Association of  
13 Science is biased toward Intelligent Design?  
14 A. Yeah.  
15 Q. Is it your opinion that the National 09: 55AM  
16 Association of Biology Teachers is biased  
17 against Intelligent Design?  
18 A. They're biased against non naturalistic  
19 explanations of anything, so yes.  
20 Q. Is it your opinion that the National Academy of 09: 55AM  
21 Science is biased against Intelligent Design?  
22 A. I don't know to what you're referring there.  
23 Can you help me out with that?  
24 Q. I'm just asking you, sir. We talked about--  
25 A. I'm not aware of that. I'm aware of statements 09: 55AM  
0069  
1 of those other two groups that specifically  
2 address that issue, but not from anyone else.  
3 Q. In your presentation you talked about the  
4 overwhelming amount of bias that Intelligent  
5 Design faces. Is that a bias that, in your 09: 55AM  
6 opinion, is as a result of the lack of  
7 scientific processes that Intelligent Design  
8 fails to present, the lack of research or is  
9 it, in your opinion, simply that those  
10 particular institutions discriminate against 09: 56AM  
11 you because of a particular bias that they may  
12 have?  
13 A. There's a tremendous amount of data supporting  
14 Intelligent Design. Every biochemical journal  
15 you would open would find evidence for 09: 56AM  
16 Intelligent Design. It's there on every page.  
17 It's just that the people that write those have  
18 blinders on and they don't want to discuss,  
19 they don't want to see it. That's my view, my  
20 opinion. That if one were to look at the data 09: 56AM  
21 objectively and ask where did that protein come  
22 from and address that question, you would be  
23 forced into-- if you're objecting to say, well,  
24 I don't know, it sure looks designed.  
25 Q. Well, to say I don't know, in your opinion, 09: 56AM  
0070  
1 then the alternative that should be taught is  
2 that it was designed?  
3 A. I think we can determine that something was  
4 designed with great alacri ty, most anybody  
5 could do that. 09: 57AM  
6 Q. Who is the designer?  
7 A. That, I don't know.  
8 Q. Would the designer imply a supernatural being?  
9 A. If you could define supernatural for me.

10 Q. Something other than human. 09: 57AM  
 11 A. Other than human?  
 12 Q. Something other than the biological processes.  
 13 A. Something-- I think that it's conceivable that  
 14 something like that could exist.  
 15 Q. When you talk about an intelligent designer, to 09: 57AM  
 16 you personally what does that mean?  
 17 A. To me personally I-- because I hold the  
 18 Christian faith I believe that we be guided by  
 19 the Bible. That's a faith position, that's not  
 20 a scientific position. 09: 57AM  
 21 Q. So the designer, according to you, would be a  
 22 Christian type designer?  
 23 A. Well-- and if I was a Muslim I would say the  
 24 designer is Allah. If I was any other faith I  
 25 might say-- you know, that's-- again, that's a 09: 58AM  
 0071  
 1 faith position, that's not science. That's my  
 2 opinion outside of the science classroom.  
 3 Q. So you would agree with me then that when we  
 4 cannot find an answer in science at this moment  
 5 that it would be appropriate to teach as 09: 58AM  
 6 science that since we don't know the answer  
 7 right now it is appropriate to assume that it  
 8 was by intelligent design someone?  
 9 A. No, I don't think that's necessarily the case.  
 10 I think the first thing we say is something you 09: 58AM  
 11 said earlier is we don't know. And we would go  
 12 a long ways in this discussion by simply having  
 13 the majority view say we don't know, instead of  
 14 saying we do know and this is what it is, it's  
 15 a naturalistic process. I'd prefer "we don't 09: 58AM  
 16 know" because that's honest.  
 17 Q. You don't-- you don't suggest that science says  
 18 that they have answers for everything, do you?  
 19 A. No, not everything. We have quite a list on  
 20 the Minority Report. 09: 59AM  
 21 Q. You understand that science is a quest for  
 22 knowledge?  
 23 A. Quest for knowledge, right.  
 24 Q. Where in the standards do you find a definition  
 25 or indication in any way whatsoever to atheism 09: 59AM  
 0072  
 1 or philosophical materialism?  
 2 A. I see it between the lines. I don't see it  
 3 written anywhere.  
 4 Q. You see it between the lines?  
 5 A. Yeah. In the presentation of unproven theories 10: 00AM  
 6 to fact.  
 7 Q. Unproven theories according to you?  
 8 A. According to me, exactly.  
 9 Q. Do the standards state anywhere that science or  
 10 evolution theory is based on atheism or in any 10: 00AM  
 11 way in conflict with belief in God?  
 12 A. No, the standards do not address that.  
 13 Q. Is it your opinion that to believe in evolution  
 14 one must adhere to naturalism?  
 15 A. If you would define evolution for me. 10: 01AM  
 16 Q. Evolution as it is in the mainstream of  
 17 scientific understanding.  
 18 A. That's what I need to have defined.  
 19 Q. You don't understand what I mean by evolution?  
 20 A. I know that that's the slipperiest term in town 10: 01AM

21 today and that term can mean change over time,  
 22 which I agree with completely. That term can  
 23 mean all that we have in the world today is an  
 24 accident and I disagree with that. So I need a  
 25 definition. 10: 01AM

0073

1 Q. Is evolution defined in Draft 2?  
 2 A. It's defined in toto, yes. It's described--  
 3 actually evolution is-- I don't think it's  
 4 described quite like that as a definition like  
 5 a dictionary definition, but it's certainly  
 6 benchmark three, standard three, the 8th  
 7 through 12th grade is all evolution. 10: 02AM

8 Q. And is it your opinion that that definition  
 9 stands for naturalism and some sort of  
 10 religion? 10: 02AM

11 A. The uncritical acceptance of a perspective that  
 12 says all of life is here by chance, which is, I  
 13 think, what the minority-- excuse me the  
 14 majority report portrays.

15 Q. Where does it say that? 10: 02AM

16 A. That's what I see it in toto. In words it  
 17 doesn't say it, that's what I see.

18 Q. So once again, you are assuming that that's  
 19 what it says? (Reporter interrupts). Just  
 20 please hang on. You are simply making an  
 21 assumption that that's what it means even  
 22 though that that is not what it says, correct? 10: 02AM

23 A. I am making the assumption based on working on  
 24 those standards for the last nine months, yes.

25 Q. The question is, that's not what the standards 10: 03AM

0074

1 say, correct?  
 2 A. We think they need to say it more clearly what  
 3 evolution is, that's why we have the Minority  
 4 Report.

5 Q. And is it your opinion that mainstream science 10: 03AM  
 6 today is, in fact, analogous to religion?

7 A. No, no, no, not at all. We're just talking a  
 8 tiny sliver of science today that concerns  
 9 itself with the origin of life. The origin of  
 10 the universe, that area, I think is 10: 03AM  
 11 fundamentally driven by a naturalistic  
 12 philosophy, but that is a very, very small  
 13 piece of science.

14 Q. Based on your interpretation, is it your  
 15 opinion that the majority are atheists? 10: 04AM

16 A. No.

17 Q. You would agree, would you not, that there is  
 18 absolutely no conflict between individuals  
 19 possessing a particular faith and their ability  
 20 to work in science? 10: 04AM

21 A. I agree.

22 Q. And you would agree, would you not, that it is  
 23 exceedingly important that science - for the  
 24 betterment of humanity, for the education of  
 25 our children, and for the separation of church 10: 04AM

0075

1 and state - should not include atheistic views?  
 2 A. I think it shouldn't include any philosophical  
 3 or religious views.

4 Q. I have nothing further for you. 10: 05AM

CHAIRMAN ABRAMS: Thank you.

6 MS. MARTIN: Thank you very much for  
 7 being here, Doctor Harris. I think you've  
 8 clarified for me and I hope for some of the  
 9 spectators what our controversy is really  
 10 about. I just want to tell you that I have 10: 05AM  
 11 three daughters who are all in science fields,  
 12 a doctor, a veterinarian, and high school  
 13 science teacher. And I was cleaning out my  
 14 closets and found their old textbooks so I  
 15 thought, well, I'd just look and, yes, I found 10: 05AM  
 16 four different types of definitions concerning  
 17 evolution. And I agree with a lot of what you  
 18 have said. I have no problem with the  
 19 definition of evolution where it applies to  
 20 microevolution. Thank you very much for your 10: 05AM  
 21 explanations.

22 EXAMINATION

23 BY CHAIRMAN ABRAMS:  
 24 Q. Doctor Harris, what is the purpose of science?  
 25 A. The purpose of science? I think science is to 10: 06AM

0076  
 1 understand the natural world.  
 2 Q. I heard you agree a few minutes ago that it was  
 3 a quest of knowledge?

4 A. It is that as well. That's kind of the way we  
 5 get there, but the goal, I think, is to 10: 06AM  
 6 understand how the world works.

7 Q. Is science a search for truth?  
 8 A. Yes, regarding the natural world.

9 Q. Is there a difference between evolution that we  
 10 can observe and evolution that we cannot see? 10: 06AM

11 A. Sure, yeah. Evolution you cannot see, you  
 12 don't know is actually-- again, there's that  
 13 slippery term, but we're talking about--  
 14 hypothesis about how different life forms came  
 15 to be if that's what you mean by evolution and 10: 06AM  
 16 we weren't there to see how it happened, we  
 17 don't know how it happened. We have to leave  
 18 it at that.

19 Q. That's commonly called microevolution, macro  
 20 evolution by some? 10: 07AM

21 A. Micro I think we do see. We can watch that in  
 22 the laboratory. That's very well  
 23 substantiated. The responses of bacteria to  
 24 media with antibiotics and developing  
 25 resistance, that's fine. They don't become a 10: 07AM

0077  
 1 new bacteria. It's a change in a particular  
 2 part of the cell membrane that allows them to  
 3 live in that environment. That is not  
 4 evolution, that is adaptation to the  
 5 environment. 10: 07AM

6 Q. Does mainstream science differentiate between  
 7 micro evolution and macro evolution?

8 A. Not clearly in my view. I think that needs to  
 9 be more clear. To me the smearing of those two  
 10 together is the problem that brought us here 10: 07AM  
 11 today.

12 Q. Why does mainstream science of today not  
 13 differentiate between them?

14 A. Well, I think that's a philosophical choice  
 15 that's been-- that's a very complicated 10: 07AM  
 16 question. Since the mid 19th century there has



17 been a move to make science only natural  
18 processes and define it that way and I think  
19 that's wrong. It's not-- science to me is not  
20 a list of allowed and disallowed explanations. 10: 08AM  
21 It's a search. It's a method. It's a process,  
22 a systematic process where you control  
23 variables and have a measured outcome and draw  
24 conclusions that don't go beyond the data.  
25 Q. I hear implicit in your answer - I'm not trying 10: 08AM  
0078  
1 to put words in your mouth, but I am trying to  
2 understand - that that is a bias. Is that a  
3 fair analysis of what you just said or is that  
4 incorrect?  
5 A. Well, that's a-- it was a very general 10: 08AM  
6 statement I just made. I think one would have  
7 to look at a specific situation. But in  
8 general when one-- when we're dealing with  
9 origins, which is a topic in the Minority  
10 Report, which is where the things come from, 10: 08AM  
11 experiments done today in real time today can  
12 form that question. It can bring us closer to  
13 understanding perhaps ways that we could have  
14 come to be. But even if you could-- by an  
15 undirected natural process produce life in a 10: 09AM  
16 test tube without an investigator manipulating  
17 anything, if that even happened, that would  
18 still-- I mean, that would be an impressive  
19 accomplishment. That would still not prove  
20 that's how it happened in the first place. It 10: 09AM  
21 would only show that it happened there. One  
22 could not conclude logically that, therefore,  
23 you have explained and proven where life came  
24 from. So even the most wildly successful  
25 experiment conducted today would not prove what 10: 09AM  
0079  
1 happened in history.  
2 Q. I heard you say earlier that one of the goals  
3 is to achieve scientific neutrality?  
4 A. I kind of mean constitutional neutrality. But  
5 the neutrality as I'm talking about, as I 10: 10AM  
6 understand the constitution, when the state  
7 endeavors or touches upon an area of religion  
8 it's required to be neutral and not to advocate  
9 or support or denigrate any view, simply  
10 neutral. 10: 10AM  
11 Q. So what is the best way to avoid-- to achieve  
12 that-- what is the best evidence that you're  
13 trying to achieve to achieve the neutrality?  
14 A. That you allow all relevant perspectives to be  
15 voiced. That all the data that hinges upon a 10: 10AM  
16 question on the table is considered and you  
17 haven't, by definition, eliminated some  
18 perspective actually meaningful things to say  
19 about the question at hand. So you just  
20 present all the data. You allow chips to fall 10: 10AM  
21 where they will.  
22 Q. One of the things that I have promoted is the  
23 idea of imperial science and I define that as  
24 what is observable, measurable, testable with  
25 people, unfalsifiable, have those criteria, 10: 11AM  
0080  
1 because I believe that that is the best way to

2 avoid bias, the best way to achieve neutrality,  
3 is that something that many scientists ascribe  
4 to or few scientists or how would you say that?

5 A. I think the vast majority of scientists ascribe 10: 11AM  
6 to that in the day-to-day work because the vast  
7 majority of scientists work in the-- what we  
8 call operational science today. They study the  
9 world as it works today from what I understand.

10 When people get sick, why do they get sick. 10: 11AM  
11 When crops won't grow, why they-- when the  
12 oceans warm, why are they warming, what can we  
13 do to cool them down. Most scientists work in  
14 and they operate in exactly those  
15 characteristics that you described. 10: 12AM

16 It's when we get into questions of  
17 origins, historical sciences that falsifiable,  
18 for example, is impossible. You cannot  
19 strictly falsify something that may have  
20 happened 30 years ago or a thousand. So 10: 12AM  
21 historical science is a different character. I  
22 think they're a valuable type of science, but  
23 we have to be more careful with the way we  
24 treat their conclusions.

25 Q. You stated earlier that in many biochemistry 10: 12AM

0081  
1 journals the idea that a code is implanted in  
2 DNA and what makes that-- what defines the idea  
3 that that is a code of design?

4 A. Well, I didn't say a code was implanted in DNA. 10: 13AM  
5 I said DNA is code.

6 Q. Okay.

7 A. It contains a sequence of chemicals that in  
8 common parlance spell out something. They  
9 spell out the shape of proteins and the  
10 proteins that they produce have functions and 10: 13AM  
11 produce living reproducing organisms, so  
12 there's function. And simply the

13 identification of a code-- I don't know of any  
14 code, there may be a code. I don't know of  
15 codes-- which is where one set of symbols 10: 13AM  
16 corresponds to another set of symbols and is  
17 used to communicate a message. I don't know

18 any example of a code coming from a  
19 nonintelligent source. So to me it's not  
20 irresponsible. It is not-- I mean, it's 10: 13AM  
21 perfectly logical to say the code in DNA may  
22 have come from some intelligence, but that's  
23 where I think I have to stop.

24 Q. Why do many mainstream scientists,  
25 evolutionists, if you will, refuse to accept 10: 14AM

0082  
1 the idea that that code is-- that DNA is a  
2 code?

3 A. Oh, no, I don't think anybody refuses, I just  
4 don't think they think about it very deeply. 10: 14AM  
5 Everybody knows it's a code. In my opinion,  
6 they haven't sat down, taken a deep breath and  
7 said where did that come from and really think  
8 about the fact that the bonds along the back  
9 bone of the nucleic acid are sugar phosphate  
10 bonds, every bond is identical. There's 10: 14AM  
11 nothing chemically that's different between the  
12 bonds between a nucleic acid and a nucleotide

13 containing a nucleus. So the fact that they  
 14 form this chain is kind of like letters on a  
 15 page. The letters don't have to be in that 10: 14AM  
 16 sequence. When they are in that sequence they  
 17 communicate information, but they don't have to  
 18 be that way. The same way in DNA, the letters  
 19 don't have to be in the sequence that they are.  
 20 By the chemical-- and the natural cause that we 10: 15AM  
 21 know of, therefore, just like text in a book  
 22 the code in DNA has the fingerprints of  
 23 intelligence, but the nature of that  
 24 intelligence, the purpose of that, the-- how it  
 25 happened, I don't know. But I can come to a 10: 15AM

0083

1 conclusion-- at least a tentative conclusion of  
 2 design, without knowing anything about where it  
 3 came from.

4 If a Coke bottle fell out of the sky into  
 5 an African desert and I was a native-- you 10: 15AM  
 6 know, the movie I'm talking about "The Gods  
 7 Must Be Crazy." Those people knew that that  
 8 Coke bottle was a design, but they had no idea  
 9 what it was.

10 There's an entire wing in one of the 10: 15AM  
 11 museums in DC that's dedicated to objects that  
 12 we don't know what they are, but we know  
 13 they're objects made by humans. I mean, you  
 14 don't have to know where it comes from, you  
 15 don't have to know who did it, you don't have 10: 15AM  
 16 to know where it was done, you don't have to  
 17 know when it was done to come to the conclusion  
 18 that something was designed.

19 Q. When DNA is injured somehow or another, what is 10: 16AM  
 20 the tendency for that DNA strand to do?

21 A. To cease to serve its purpose well. It  
 22 generally will totally depend on where the  
 23 mutation is and the intensiveness of mutation.  
 24 But in the same way if you garbled the letters  
 25 in a paragraph you would lose the sense of the 10: 16AM

0084

1 sentence of that paragraph.

2 Q. You talked about earlier that mutations that  
 3 are beneficial versus harmful.

4 A. Uh-huh.

5 Q. What are those mutations that are beneficial? 10: 16AM

6 A. There are in some-- there are very few, but one  
 7 that I would mention is there's something we  
 8 call a gain of function mutation where a gene  
 9 or a particular organism at one time lost a  
 10 function then had another mutation that brought 10: 17AM  
 11 it back. That's not really advancing anywhere,  
 12 it's sort of returning to ground zero again  
 13 from being in the basement. So that kind of  
 14 mutation can happen. But by in large, I'm not  
 15 a geneticist, but as I understand genetics and 10: 17AM  
 16 mutations-- I work with them, almost all  
 17 mutations are considered either neutral or  
 18 harmful to the existence-- for the existence of  
 19 the organism.

20 Q. Okay. I thank you very much for your time. 10: 17AM

21

22

23

EXAMINATION

BY MS. MORRIS:

24 Q. Doctor Harris, I want to also thank you for  
25 coming. I wish I had had you in my office to 10: 17AM  
0085  
1 answer all the e-mails that came our way from  
2 across the circuit. You did a great job.  
3 Thanks. I just have one question. If you  
4 recall-- and I apologize I don't have Draft 2  
5 in front of me, but if you recall grade eight, 10: 18AM  
6 it would be standard three, benchmark three,  
7 the definition of evolution. Was this an  
8 assessment item?  
9 A. We have not-- to my knowledge, we have not yet  
10 decided-- because this is still somewhat up in 10: 18AM  
11 the air this section on evolution, we have not  
12 decided what is going to be tested, what's  
13 going to be assessed and what's not. So  
14 nothing is marked at this point on the  
15 assessment. 10: 18AM  
16 Q. Is it your feeling that the committee believes  
17 that that should be an assessment item?  
18 A. I think that kids need to understand Darwinian  
19 evolution, they need to understand spades. And  
20 the problem we have here is people don't 10: 18AM  
21 understand it. And so I would hope somebody  
22 would put a great big red "X" by this and test  
23 it because it needs to be really highlighted.  
24 Q. Okay. Then grade seven, evolution as a theory.  
25 Do you recall if that is an assessment item? 10: 19AM  
0086  
1 A. That, I don't believe is. Actually I think  
2 that is part of teacher notes, as I recall,  
3 something that would not be assessed.  
4 Because-- you know, just kind of--  
5 Q. Okay. My point is that the way these are 10: 19AM  
6 written, wouldn't you agree, that the  
7 assessment-- state assessments are written  
8 around the standards and that it's very  
9 critical that we get every word correct and  
10 reflected in appropriate scientific inquiry? 10: 19AM  
11 A. Yeah. No, I agree with that.  
12 Q. Okay. And then to add informed to the mission  
13 statement, what were some of the reasons not  
14 wanting to add the word informed?  
15 UNIDENTIFIED SPEAKER: Two minutes 10: 19AM  
16 left.  
17 A. Yeah, that's a good question, why would you not  
18 want to add that word. I think in the  
19 discussions, as I recall it, Mr. Crab said--  
20 and, Jack, you correct me if I'm wrong. 10: 20AM  
21 MR. CRAB: I will.  
22 A. I trust you to do that. That on its surface  
23 there is nothing wrong at all with adding the  
24 word inform. But what Jack objected to was all  
25 the explanation and verbiage below it and that 10: 20AM  
0087  
1 was some kind of Trojan horse coming in with  
2 it. Is that a fair assessment, Jack?  
3 MR. CRAB: Are you giving me the  
4 opportunity to answer that?  
5 MR. IRIGONEGARAY: Wait a minute. I 10: 20AM  
6 think in all fairness he's asked a question of  
7 Mr. Crab and Mr. Crab should be permitted to  
8 answer it.

9 MS. MORRIS: We're probably down to  
10 one minute. 10: 20AM  
11 MR. IRIGONEGARAY: It's not fair.  
12 MR. CRAB: I'll hold a brief press  
13 conference at break.  
14 MR. IRIGONEGARAY: Fair enough.  
15 MR. CRAB: I'll be glad to do that. 10: 20AM  
16 MR. IRIGONEGARAY: Fair enough.  
17 Thank you, sir.  
18 MS. MORRIS: That's all I have.  
19 Thank you.  
20 CHAIRMAN ABRAMS: We've completed 10: 21AM  
21 this session a little bit early, so we're going  
22 to take a ten-minute break starting at 10: 20 we  
23 will respond and be back at 10: 30.  
24 (THEREUPON, a short recess was had).  
25 CHAIRMAN ABRAMS: We need to go ahead 10: 34AM

0088

1 and get started again, please. There are a  
2 couple of points I need to bring out. Please  
3 be aware of the following. This has been given  
4 to us by the security personnel. Security asks  
5 that all cameramen and photographers stay 10: 34AM  
6 behind the blue lines. We just have room in  
7 the aisles as a safety precaution, this is fire  
8 code, allowing people to move in and out.  
9 Anyone that is reentering is asked to take a  
10 seat and not stand in the back or the side of 10: 34AM  
11 the room. Again, we must have an open pathway  
12 throughout the room, this is for the fire code.  
13 Anybody not abiding by these will be asked to  
14 leave. And may I have your attention, please.  
15 Just hold it down. We're ready to go with the 10: 34AM  
16 next witness. Mr. Calvert.  
17 MR. CALVERT: Doctor Abrams and  
18 members of the committee, I'd like to introduce  
19 you to Doctor Charles Thaxton.  
20

21 CHARLES THAXTON, PhD,  
22 called as a witness on behalf of the Minority  
23 testified as follows:  
24

25 DIRECT EXAMINATION

0089

1 BY MR. CALVERT:  
2 Q. Doctor Thaxton, I want to thank you for taking  
3 the time to come and visit with us today on, I  
4 guess in particular, the origin of life. Would  
5 you please introduce yourself a bit better 10: 36AM  
6 about your background and your qualifications  
7 to speak today about chemical evolution.  
8 A. You want academic background?  
9 Q. And could you-- just a second. Please use the  
10 microphone. Is the microphone turned on? 10: 36AM  
11 A. Yes. I have a Ph.D. in chemistry from Iowa  
12 State University in Ames and I have studied  
13 beyond that. Post doctoral degree in history  
14 study at Brandeis University and also Harvard  
15 University where I studied history of science 10: 37AM  
16 in the molecular biology labs at Brandeis. And  
17 academic background, my undergraduate was in  
18 chemistry and, of course, all my graduate  
19 degrees were in chemistry as well.

20 Q. So how did you get interested in origin of 10: 37AM  
21 life?

22 A. I got interested in the origin of life during  
23 graduate school days. We had a visiting  
24 professor from-- I'm not sure what university  
25 he came by. The American Chemistry Society on 10: 37AM

0090

1 a regular basis sent guest speakers to  
2 university campuses and this was on one of  
3 those occasions we had a seminar for our  
4 department and the full house attended the  
5 subject of the origin of life. And I thought 10: 37AM  
6 it was quite interesting because the discussion  
7 was very animated. And that was my first  
8 introduction professionally to anything like  
9 chemistry dealing with these evolution  
10 subjects. 10: 38AM

11 So I was fascinated from the point of  
12 view how evolution had come to my department in  
13 chemistry, so I was included in and listened.  
14 And then, of course, over the years after that  
15 I listened to other professors and talked to 10: 38AM  
16 them and graduate students who were doing  
17 research on one level or another that related  
18 to the subject of origin of life and I asked  
19 questions.

20 But it really happened in a profound way 10: 38AM  
21 when I-- in 1967 when an article appeared in  
22 the chemical engineering news magazine, front  
23 cover was "Life Transcending Physical  
24 Chemistry" I think was the title. And I read  
25 this with great interest. It was all about the 10: 38AM

0091

1 message sequences in DNA and the unusual  
2 properties that they seem to have the capacity  
3 to communicate information, but they're not  
4 related-- but they cannot be accounted for by  
5 the rules of physics and chemistry. Hum, that 10: 39AM  
6 was fascinating. So I continued to be of  
7 interest and interested in that.

8 And then after I finished my Ph.D. in  
9 chemistry, I went to the post doctoral program  
10 in the history of science department. At 10: 39AM  
11 Harvard they gave great latitude to pursue  
12 interests in a lot of areas and one of my areas  
13 of interest was I was beginning to read in a  
14 very serious way the literature on the origin  
15 of life. And in those next two years I not 10: 39AM  
16 only read quite a few papers on the subject,  
17 but also talked with professors at Harvard and  
18 MIT, both who were doing research in these  
19 areas. So I began to get more and more  
20 interested. And then when I went to my post 10: 39AM  
21 doctoral program, well, we had people in our  
22 department who were actively involved in areas  
23 of the origin of life.

24 Q. Where was the post doc?

25 A. This was at Brandeis University. And then 10: 40AM

0092

1 Later I met a man by the name of Walter Bradley  
2 who was a professor at Texas A and M University  
3 and his interest was also in the area of origin  
4 of life. And we compared notes and discussed

5 and eventually we teamed up with another man, a 10: 40AM  
6 geochemist, Roger Olsen, and we wrote a book on  
7 our analysis of chemical evolution.  
8 Q. Doctor Bradley is an engineer. Is that  
9 correct?  
10 A. Yes, but on material science. 10: 40AM  
11 Q. How did that impact the origin?  
12 A. Well, his expertise was in thermal dynamics.  
13 And every chemical reaction includes the energy  
14 process by which the transformation takes  
15 place. So he was a very valuable addition to 10: 40AM  
16 our effort.  
17 Q. So the three of you, Doctor Bradley and Doctor  
18 Olsen, and yourself--  
19 A. Yes.  
20 Q. Doctor Olsen being a geochemist? 10: 41AM  
21 A. He provided the geological aspects.  
22 Q. And so Bradley had the thermal dynamic  
23 perspective and you the chemical perspective?  
24 A. Yes.  
25 Q. And what was the product of your work? 10: 41AM  
0093  
1 A. The book was called, "The Mystery of Life's  
2 Origin," published in 1994. And that was  
3 followed up by quite an extensive lecture  
4 program. In fact, even prior to that, for five  
5 years before we wrote the book I was giving 10: 41AM  
6 lectures on that same subject in universities  
7 throughout America. So when the book came out  
8 it was really a final written down expression  
9 of what we had been lecturing on for the  
10 previous four or five years. 10: 41AM  
11 Q. The book is titled, "The Mystery of Life's  
12 Origins," are you going to tell us more about  
13 that later on?  
14 A. Yes, what the book is.  
15 Q. How is this going to proceed-- and maybe you 10: 42AM  
16 might also comment, has it been updated since  
17 19-- I believe you said it was published in  
18 '84?  
19 A. Yes, it was reissued, but not reedited, but  
20 reissued in 1992. We had-- we wrote an update 10: 42AM  
21 chapter in 1998, not for English publication,  
22 but for the Hungarian edition and also the  
23 Czech edition of our book. So the English  
24 version of it has not been made available, but  
25 it has been updated. 10: 42AM  
0094  
1 And the book was at first, like we were,  
2 very anxious to see if anybody noticed it. And  
3 after seven or eight months it seemed no one  
4 had. And then there started to appear a few  
5 reviews in biological journals and chemical 10: 42AM  
6 journals and these were mostly negative. And  
7 that gave us the notoriety at that point. The  
8 negativity produced thousands of situs. And so  
9 otherwise it might have been a total failure.  
10 Q. Do you know Robert Schapiro? 10: 43AM  
11 A. Oh, yes, Bob and I have been friends for some  
12 years.  
13 Q. And he also is interested in chemical  
14 evolution?  
15 A. He is-- really he is an expert on DNA 10: 43AM

16 chemistry.  
17 Q. What does he think about your book?  
18 A. Well, he liked it. He wrote a blurb on the  
19 book. When I first-- we knew he didn't agree  
20 with our total point of view as a critical 10: 43AM  
21 analysis, but we also knew he understood the  
22 chemistry involved and felt like he would  
23 probably give a fair assessment, at least from  
24 what I knew of reading several articles he had  
25 written at that time. 10: 43AM

0095  
1 So we sent Bob a copy of the manuscript  
2 and then a few weeks later I talked with him on  
3 the phone and he basically said that he was  
4 writing a book also. In fact, his book came  
5 out a couple years later called, Origins of-- I 10: 44AM  
6 forget.  
7 Q. "Origins, A Sceptic's Guide to the Origin of  
8 Life."  
9 A. Right, that was his book. He said he was going  
10 to write a more popular level book because we 10: 44AM  
11 had written what he had wanted to say on a more  
12 technical level. So he wrote a popular book.  
13 Q. Have you reviewed the Minority Report?  
14 A. Yes, I have.  
15 Q. And I believe there is an indicator that covers 10: 44AM  
16 issue of origins. Let me see if I can't bring  
17 it up on the screen here. Indicator seven in  
18 the evolution benchmarked as standard three,  
19 benchmark three, grades eight to twelve. And  
20 you've reviewed this particular proposal? 10: 45AM  
21 A. Yes.  
22 Q. And why do you believe that science standards  
23 should cover this particular issue, the origin  
24 of life at all?  
25 A. Well, first of all, chemical evolution is the 10: 45AM

0096  
1 chemical preamble to biological evolution. So  
2 not only logically, but because it is  
3 important. But the-- as far as the curriculum  
4 goes I think it needs to be in there because  
5 textbooks already mention something about it, 10: 45AM  
6 they mention about the origin of life. So what  
7 these guidelines do is give some kind of  
8 evaluation of it and that's why I'm here to  
9 give testimony.  
10 Q. The purpose of the standards is to give set 10: 45AM  
11 standards for what students are to know--  
12 A. Yes.  
13 Q. -- about a particular subject. And this  
14 particular area we're talking about is  
15 biological evolution and you believe that in 10: 46AM  
16 order for them to, quote, understand that idea  
17 they also need to understand chemical  
18 evolution?  
19 A. Yes. Chemical evolution, according to the  
20 overall evolutionary theory, needs to have 10: 46AM  
21 something that can evolve and chemical  
22 evolution tells the story of where that came  
23 from.  
24 Q. Have you reviewed the textbook descriptions of  
25 chemical evolution? 10: 46AM

0097



1 A. Yes.  
2 Q. And could you characterize those as being  
3 complete, not complete?  
4 A. Highly incomplete. In fact, at some point I  
5 have a few minute presentation to give that 10: 46AM  
6 would cover this and maybe that question as  
7 well. So at some point I should do that.  
8 Q. Okay. Indicator seven seeks to cover the  
9 issues that you're going to discuss here--  
10 well, actually maybe this is-- is this the time 10: 47AM  
11 to get into your power point discussion?  
12 A. Yes, it covers that exactly.  
13 Q. Okay. And I think at this point we're going to  
14 transfer the computer to Doctor Thaxton's table  
15 so he can manipulate it. 10: 47AM  
16 A. Okay. I'm going to begin with a letter that  
17 Francis Crick wrote to his son in 1953. This  
18 was just a matter of weeks before his famous  
19 publication about DNA appeared in the journals.  
20 In his letter to his son he was trying to 10: 48AM  
21 describe it-- notice that in red DNA is a  
22 code-- and he went on to describe, but it works  
23 just like newsprint to convey a message. He  
24 clarified in a very famous paper a couple years  
25 later-- a few years later what he meant by 10: 48AM  
0098  
1 information as the precise determination of  
2 sequence either of a nucleic acid base or of  
3 the amino acids in a protein. So that's what  
4 he meant by information.  
5 But since this has become over the years 10: 48AM  
6 the essential feature and cart of the whole  
7 origin of life discussion, it's very important  
8 to keep these three words in mind and clearly  
9 as to what it is that, according to Crick,  
10 needs to be accounted for in the origin. 10: 49AM  
11 So the first-- I have three letters--  
12 three arrangements of letters. The first one  
13 is on order arrangement. And by definition  
14 order is periodic. So these letter  
15 arrangements of X, Y, Z and spaces repeat 10: 49AM  
16 across the page. An actual example of this  
17 would be a wallpaper pattern or a floor tile  
18 pattern and that's an example of what is meant  
19 by order.  
20 The second letter arrangement is a 10: 49AM  
21 complex arrangement. And by definition these  
22 are nonperiodic or aperiodic. Now, that set of  
23 letter sequences is all jumbled up letter  
24 sequences, no particular order or arrangement.  
25 And that is like the amino acids in a polymer 10: 49AM  
0099  
1 that are gradually linked together. So that's  
2 a complex arrangement.  
3 Now, there's a third arrangement that is  
4 also complex, therefore aperiodic. But this  
5 one, unlike number two, is said to be 10: 50AM  
6 specified. Now, the letters look random like  
7 the others above until you figure out that  
8 they're a code and-- if you know how to read  
9 it. And so this was the stunning feature that  
10 Francis Crick had talked about in his letter to 10: 50AM  
11 his son.

12 Now, from this we have a progress  
13 immediately to the chemical evolution scenario  
14 that is not only in the textbooks throughout  
15 the world and really in quite a few different 10: 50AM  
16 levels of education we find this scenario  
17 taught in the books. Originally the idea was  
18 that the chemicals in the atmosphere reduced  
19 gasses would react under the influence of  
20 ultraviolet light from the sun, electrical 10: 50AM  
21 discharges in the atmosphere, produce amino  
22 acids and they would crawl into the ocean or  
23 the water bodies of the earth. And then the  
24 amino acids would chemically react and  
25 eventually produce proteins and the 10: 51AM  
0100  
1 heterophysycic basis or the nucleic acid basis  
2 would react with appropriate sugar and  
3 phosphates to make nucleic acids. And  
4 eventually through this kind of reaction  
5 process in the sea or the ocean, the water 10: 51AM  
6 bodies, small lagoons, lakes, whatever,  
7 eventually life as we know it would have formed  
8 through a chemically-- I mean, a biologically  
9 able to sustain and go on and give the  
10 evolutionary process. That's what I meant by a 10: 51AM  
11 chemical preamble to biological evolution.  
12 And, of course, to illustrate the  
13 scenario-- Francis Crick did his work in '53.  
14 Same year another publication by Stanley Miller  
15 included the famous diagram with his name 10: 51AM  
16 usually associated with it, The Miller  
17 Experiment, in which these reduced gasses were  
18 put in glassware and chemicals were reacted  
19 under the influence of spark discharges and the  
20 chemicals produced collected in the water. 10: 52AM  
21 Upon analysis it was found that there were some  
22 amino acids that are known to be in living  
23 proteins. At the time this was quite dramatic  
24 and amazing. No one really expected to find it  
25 quite like this. It had been talked about 10: 52AM  
0101  
1 since the '20s, but this was an experimental  
2 demonstration it seemed of just what those who  
3 wrote about it 30, 40 years before had written  
4 about it and here it was getting experimental  
5 confirmation that were on the early stages of 10: 52AM  
6 this very process to produce life. So it was  
7 written up in all the books, as well as all the  
8 newspapers and magazines across the country.  
9 But what is not usually known and what is  
10 not usually given in textbook analysis, 10: 53AM  
11 although all the various data-- not all of it,  
12 but enough to give you the idea that there's a  
13 great deal of support for this hypothesis.  
14 What is usually missing in textbooks and what I  
15 believe this benchmark number seven was trying 10: 53AM  
16 to address is any kind of an appropriate  
17 response to this. So here are the kind of  
18 things that are usually not mentioned in  
19 textbooks. It's usually not mentioned that  
20 there is no evidence that there was ever a 10: 53AM  
21 reducing atmosphere on the plant earth. Nor is  
22 it ever mentioned that there is no geological

23 evidence that there was ever prebiotic soup on  
 24 plant earth.  
 25 The question of optimal activity, which 10: 53AM  
 0102  
 1 means that amino acids that are produced in  
 2 Miller's reaction flasks appeared both right  
 3 handed and left handed forms, but in-- I mean,  
 4 amino acids of proteins only the left hand  
 5 amino acids are actually formed. 10: 54AM  
 6 Also the idea of a question of a  
 7 shrinking time frame. In 1960s we thought  
 8 there was on the order of a thousand or a-- a  
 9 thousand million years or a billion years for  
 10 these chemical processes to produce life. Even 10: 54AM  
 11 at the time our book was written in 1984 that  
 12 figure had shrunk from a billion years to only  
 13 a 170 million years as a time frame. But more  
 14 and more has been learned about the planet and  
 15 now a few years ago it was declared that, well, 10: 54AM  
 16 there's probably no more than 10 million years  
 17 at the outside for which life could have  
 18 produced and that has been gradually shrinking  
 19 down. You go to origin of life conferences and  
 20 you hear people talking in numbers below a 10: 55AM  
 21 million and some even suggest thousands of  
 22 years. In other words, a very quick process,  
 23 too quick for geological time measures to deal  
 24 with. So, in effect, as soon as we have the  
 25 earth cooled enough to bear life, there's 10: 55AM  
 0103  
 1 geological evidence that life already exists.  
 2 So that's what I mean by the shrinking time  
 3 frame.  
 4 There's also the difficulty of the  
 5 problem of interfering cross reactions. And 10: 55AM  
 6 this simply means that in the-- in the reaction  
 7 flask, for example, that Miller performed, yes,  
 8 there are amino acids present, but in a real  
 9 earth, in a real water body environment, you  
 10 would also find amino acids reacting with 10: 55AM  
 11 sugars, reacting with other amines, reacting  
 12 with our amino acids even, different ones that  
 13 are living biological amino acids, as well as  
 14 other types of chemical reactions. The end  
 15 result would be what I call interfering cross 10: 56AM  
 16 reactions that would lead to nonproductive dead  
 17 ends. And as the end result of all that they  
 18 take the amino acids out of the soup of  
 19 chemicals effectively very early on.  
 20 And so even though number two up there I 10: 56AM  
 21 said there's no prebiotic soup, no evidence for  
 22 one, every theory still talks about a dilute  
 23 soup. But how dilute, how dilute? Perhaps and  
 24 probably no more concentrated than today's  
 25 oceans in amino acids. That is what I mean by 10: 56AM  
 0104  
 1 very dilute.  
 2 Other situations-- another issue or  
 3 another problem that needs to be addressed or  
 4 mentioned in these textbooks, I believe,  
 5 curriculum, is the fact of undirected energy 10: 56AM  
 6 flow. Yes, there's a lot of energy around,  
 7 but-- and it goes into the chemicals to make

8 chemical reactions, but they are not directed  
 9 in any way to give something meaningful.  
 10 To illustrate, if you had a pile of 10: 57AM  
 11 bricks here and put a stick of dynamite right  
 12 under it, yes, you would have a lot of energy  
 13 liberated, but it would not produce anything  
 14 effective like a house. And so the same would  
 15 happen in these on the early earth according to 10: 57AM  
 16 the way energy is used in an undirected way.  
 17 But the most difficult of all is there's no  
 18 abiotic source of information. Now, that was  
 19 the number one feature that Crick mentioned in  
 20 that letter to his son. And he defined it as 10: 57AM  
 21 what he meant needed to be explained and  
 22 there's no abiotic, there's no nonbiological  
 23 source, there's no way chemically, physically,  
 24 biologically, nonbiologically to produce that  
 25 information. 10: 58AM

0105  
 1 Now, over the years there's no shortage  
 2 of theories to try to do it. I won't go into  
 3 these, I'll just mention them here. But on the  
 4 next there's also the same kind of thing, no  
 5 shortage of theories dealing with different 10: 58AM  
 6 ways in which to suggest how the information  
 7 may have or might have been produced. One of  
 8 the more common ones is what is called here the  
 9 RNA world. RNA is a variant of DNA, it's  
 10 another nucleic acid, but it's become very 10: 58AM  
 11 important. But I want to mention-- just show  
 12 you what is involved here without getting into  
 13 the specifics.  
 14 In order to make RNA you have to first of  
 15 all have the nucleotides, the nucleotides have 10: 58AM  
 16 to come together. I only show this to  
 17 emphasize the fact that even at this simple  
 18 level there is 2,160 different nucleotides and  
 19 there's only one of them that appears in a  
 20 biological system. Well, of course, that 10: 59AM  
 21 number grows big time by the time you get to  
 22 the hundreds that are in RNA and even more when  
 23 you have DNA. So the point is that it's not a  
 24 trivial problem and the undirected energy flow  
 25 and those-- and those interfering cross 10: 59AM

0106  
 1 reactions would virtually guarantee that those  
 2 chemical soups would be virtually deficient in  
 3 any-- missing even any of these kind of  
 4 chemicals like this. And by the way this is  
 5 one of the principal arguments that you 10: 59AM  
 6 mentioned-- you mention Bob Schapiro earlier.  
 7 This is one of the things that he and I talked  
 8 about. It's just this very reaction. He's  
 9 probably written some of the definitive  
 10 material on how adolene, for example, and other 10: 59AM  
 11 substances like ribose here, the sugar, would  
 12 be virtually absent from the chemical soups.  
 13 So what do I advocate? One, a clear  
 14 presentation of chemical evolution, including  
 15 supporting evidence and the criticism. And, 11: 00AM  
 16 second, I advocate a view of science that keeps  
 17 an open mind and uses an open method that  
 18 follows evidence where it leads.

19 Now, there is a perspective that says  
20 science proceeds by only examining natural 11: 00AM  
21 causes. The natural cause only view. Well, in  
22 my experience and certainly in this case of  
23 origin of life that we're going to see, I think  
24 it's an especially applied rule or principle--  
25 it's not really a principle, it's just adhered 11: 00AM  
0107  
1 to in these origin areas because it's easy to  
2 demonstrate in the general case that it's  
3 false. For example, a case of Jones lying dead  
4 on the floor. We consider natural causes only.  
5 Oh, really. We cannot consider the possibility 11: 00AM  
6 that there was-- that there was murder or  
7 suicide. What about the case of the exploding  
8 space shuttle? You mean to tell me we cannot  
9 consider the idea of sabotage. And what about  
10 a burning building? There's no way to consider 11: 01AM  
11 that maybe arson was involved, we have to  
12 consider natural causes only. What about those  
13 signals from space we've been hearing about?  
14 There's no way to consider that maybe  
15 extraterrestrial intelligence had anything to 11: 01AM  
16 do with this. Of course, this was all done  
17 within science, but it wouldn't be possible to  
18 carry on this investigation if we practice  
19 rigorously this idea of natural cause only.  
20 Also what about this, natural cause only, 11: 01AM  
21 well, maybe those random typing monkeys  
22 produced it. But we know from experience  
23 there's a code that can spell this out. What  
24 about the situation of Eoliths? Eoliths were  
25 stones that were discovered and for many years 11: 01AM  
0108  
1 they were thought to be indicators of early  
2 human activity, but it so happens with-- what I  
3 call the method of following experience where  
4 it goes you were free to consider other  
5 possibilities besides human activity. And 11: 02AM  
6 eventually the assignment of cause was changed  
7 and now we recognize that these were just the  
8 result of stones tumbling in a river, or  
9 something like that, naturally produced.  
10 So I have this up here, I have-- somehow 11: 02AM  
11 it doesn't come out quite right. But the end  
12 result is that we're going to follow the  
13 evidence where it leads. That's the problem.  
14 So what's the ultimate response to all of this.  
15 Just say no to natural cause only and follow 11: 02AM  
16 evidence where it leads.  
17 So how do we in a real case, a real  
18 situation follow the evidence where it leads.  
19 We know, for example, if we find a fossil in  
20 the ground we know how to work backwards to the 11: 02AM  
21 cause, we know how to account for this by  
22 making proper inference and so we infer that  
23 there was some creature that produced the  
24 fossil. And we've also, since the great  
25 molecular biological revolution, have learned 11: 03AM  
0109  
1 to make a further inference and we know that  
2 somehow it's related or connected to the  
3 informational information in the DNA and RNA.

4 So the big controversy is what we put here.  
5 What I'm urging this committee to do and in 11: 03AM  
6 other places is to not close off the  
7 possibility. Don't just impose a natural cause  
8 only perspective that would force the answer to  
9 be natural process when not only did Francis  
10 Crick not know any natural process that could 11: 03AM  
11 produce it, no one else in the world today  
12 knows a natural process that could produce it.  
13 And you can tell, I believe, what Crick himself  
14 was thinking as other possibilities when he  
15 said biologists when considering DNA must 11: 03AM  
16 constantly keep in mind that what they see was  
17 not designed, but rather evolved.  
18 So the purpose of my testimony here is  
19 not to advocate or promote Intelligent Design,  
20 but simply to point out that the guidelines, if 11: 04AM  
21 they are-- if you're not careful in avoiding  
22 some decision that would adopt a process or a  
23 methodology that would prevent acquisition of  
24 humanology in the future that might counter the  
25 natural cause answer. So that's the thing that 11: 04AM  
0110  
1 I would say and the end.  
2 Q. Thank you, Doctor Thaxton. Indicator seven  
3 section, to cover the issues of your talk, you  
4 believe the indicator states an appropriate  
5 goal and so why is it necessary to complete a 11: 04AM  
6 student's understanding of biological  
7 evolution?  
8 A. Well, let's see here, where are you, on number  
9 seven?  
10 Q. Yeah. Maybe if I could have the computer back. 11: 04AM  
11 A. Yeah.  
12 Q. Okay. Here's the indicator seven I just asked  
13 you about and the question was, is that an  
14 appropriate goal for the standards that  
15 students will be able to explain the proposed 11: 05AM  
16 scientific explanations of the origin, as well  
17 as the scientific criticisms of those  
18 explanations, is that an appropriate goal and  
19 why is it that students should be introduced to  
20 that subject in the standards? Maybe you've 11: 06AM  
21 already covered that.  
22 A. Yeah, I think I did. I think it is an  
23 appropriate goal, yes. But my understanding  
24 was that there's nothing like this in the  
25 standards now. Is that correct? 11: 06AM  
0111  
1 Q. That's correct.  
2 A. Well, that's why I'm here to urge the Board  
3 to-- or the committee to add this because I  
4 think it is important to know about chemical  
5 evolution. But the big danger is this, that 11: 06AM  
6 this is a highly speculated theory and if you  
7 have a highly speculated theory that is  
8 unchecked by criticism there's a real danger  
9 there, especially with student minds, to draw  
10 the wrong conclusion and think that speculation 11: 06AM  
11 is really solid knowledge when it isn't. This  
12 is a highly speculated theory.  
13 Q. The word "understand" as the dictionary defines  
14 it means to comprehend and appreciate the

15 subtleness of and so forth, and the word 11: 07AM  
 16 understand prefaces the idea that students will  
 17 understand biological evolution. So are you  
 18 testifying that in order to fulfill the goal of  
 19 true understanding and comprehension students  
 20 need to receive this information? 11: 07AM  
 21 A. I think the problem-- yes, that the problem--  
 22 the question of where the cell came from is  
 23 relevant to the study of biology itself.  
 24 Q. What would-- in your opinion, what would it  
 25 take to development curriculum for this 11: 07AM  
 0112  
 1 particular standard?  
 2 A. Well, there would need to be an accurate  
 3 statement of what chemical evolution is and a  
 4 presentation of legitimate data in support of  
 5 it, as well as criticism of it. That's the-- 11: 07AM  
 6 that's what I think needs to be done. It  
 7 hasn't been done yet to do that because there's  
 8 some of the textbooks already that give a fair  
 9 job of reviewing, at least on high school level  
 10 and other levels, what is involved in the 11: 08AM  
 11 origin of life and what that theory is. But  
 12 if-- my purpose for being here would be  
 13 adequately covered if there was also enough of  
 14 a criticism to suggest to the students that,  
 15 well, maybe this is not subtle knowledge after 11: 08AM  
 16 all.  
 17 Q. So your curriculum would, in a sense, envision  
 18 perhaps some supplementation to the current  
 19 standard textbook?  
 20 A. Well, if there's no textbook available, yes. 11: 08AM  
 21 Q. Do you have any suggestions for improving the  
 22 indicator?  
 23 A. Well, I think maybe some of the terminology in  
 24 the language in different places might be typed  
 25 up, but overall I think it's okay. I haven't 11: 09AM  
 0113  
 1 analyzed every word carefully, but I think it's  
 2 fine.  
 3 Q. Doctor Harris talked earlier today about  
 4 scientists that had peer-reviewed the Minority  
 5 Report and specifically made comments on this 11: 09AM  
 6 particular proposed addition to it. Did you  
 7 look at any of those peer reviews?  
 8 A. Yes, I did.  
 9 Q. Did you have any comments on those?  
 10 A. Well, just a general one. I really think that 11: 09AM  
 11 what we're doing is looking at this Minority  
 12 Report, I was focusing in primarily on the  
 13 origin life part. But I would say they were so  
 14 focused using the lens of a natural versus  
 15 supernatural way of thinking that they 11: 09AM  
 16 perceived any criticism of evolution or  
 17 chemical evolution as tantamount to attacking  
 18 science and, of course, that is false. There  
 19 is no science without an adequate criticism and  
 20 so this is-- this is part of the science is 11: 10AM  
 21 criticism. And any science that weathers the  
 22 criticism and survives, the better theory for  
 23 it. So yes.  
 24 Q. I'd like you to switch to focus on this one  
 25 indicator-- or this one benchmark to indicator 11: 10AM

0114

1 one which describes evolution-- biological  
 2 evolution descent with modification is a  
 3 scientific explanation for the history of the  
 4 diversification of organisms from common  
 5 ancestors and then the Minority Report would 11: 10AM  
 6 add a couple of sentences under A that would  
 7 add to that. And the first sentence is,  
 8 "Biological evolution postulates an  
 9 unpredictable and unguided natural process that  
 10 has no discernible direction or goal." My 11: 10AM  
 11 first question is, do you believe that sentence  
 12 is scientifically accurate and valid?  
 13 A. I think it describes the Darwinian thought,  
 14 yes.  
 15 Q. Do you think that is information that students 11: 11AM  
 16 should understand in order to have or  
 17 comprehend biological evolution?  
 18 A. You mean that there's no guidance?  
 19 Q. Yes.  
 20 A. Yes. If they're going to understand the 11: 11AM  
 21 theory, they need to know that part of it too.  
 22 Q. Okay. The second sentence is, "It also assumes  
 23 that life arose from an unguided natural  
 24 process." Is that also a scientific valid  
 25 statement and perhaps something the student 11: 11AM

0115

1 should understand?  
 2 A. Yeah. In chemical evolution the only guiding  
 3 that's been done, if there is any, is chemical  
 4 law and chance, chance chemical reaction  
 5 through natural processes and natural law. All 11: 11AM  
 6 that was there involved Darwinian thought to do  
 7 it, so evolution entails that.  
 8 Q. Sort of an overview, what is the current status  
 9 of the scientific thinking about the origin of  
 10 life? I mean, are we closer to an answer or is 11: 12AM  
 11 it-- have we gone back a step; I mean, how  
 12 could you explain that position?  
 13 A. Chemical evolution is some-- it depends on who  
 14 you read obviously. But in many ways it's  
 15 become a stagnant field in the sense that the 11: 12AM  
 16 essential issues or problems, like the  
 17 information problem I talked about, there's  
 18 been hardly any advance on that. Do we have  
 19 theories? Yes, more all the time. And for  
 20 that it's-- there's enough new material or new 11: 12AM  
 21 things happening, being talked about to fill up  
 22 many conferences.  
 23 But there are certain areas in-- like,  
 24 for example, our book was written in 1984, you  
 25 wanted to know why we haven't revised it maybe 11: 13AM

0116

1 since, that's a part of the problem in that in  
 2 some of these areas there's not much need of a  
 3 revision because there hasn't been that much of  
 4 a change. There's other areas where new  
 5 theories have come in. Like when we wrote our 11: 13AM  
 6 book the RNA hypothesis wasn't discussed, but  
 7 it is now. But the point is the same level of  
 8 what goes on in that soup is the same as before  
 9 and general-- generally there's not been a  
 10 great advance beyond where things were even 11: 13AM



11 back then. New theories, but they don't solve  
12 the essential basic problems. If that helps.  
13 So review-- in other words, review  
14 articles still come out today that say we are a 11: 13AM  
15 long way from solving the problems. And  
16 perhaps one of the greatest illustrations of  
17 how little progress has been made comes from  
18 people like Stanley Miller who have been at it  
19 from the beginning and they say--  
20 UNIDENTIFIED SPEAKER: Two minutes. 11: 14AM  
21 A. How little progress has been made.  
22 Q. (BY MR. CALVERT) Do you think-- well, let me  
23 ask you this, what is, in your mind, evidence  
24 of design in natural phenomenon?  
25 A. Well, this is the-- if you want to look at it 11: 14AM  
0117  
1 there's been a lot of discussion and I would  
2 say even things like in physics areas,  
3 astronomy areas, as well as biochemistry areas  
4 a lot of this has been discussed and talked  
5 about whether it be a carbon atom itself, there 11: 14AM  
6 have been people who have talked about them  
7 even the carbon atom was designed. I think  
8 what they mean by that is do you need relevant  
9 plays among all the atoms in its role in life  
10 processes. But in addition it's part of what 11: 15AM  
11 became known later as the fine tuning problem  
12 of the universe. All the physical constants  
13 have to be just so in order to have life as we  
14 know it. So that is generally what I consider  
15 the design feature of the universe. 11: 15AM  
16 Now, you don't have to be a religious  
17 person to draw that conclusion. I mean, there  
18 are plenty of people who are not religious who  
19 are amazed as anybody else is by these design  
20 features. That they're apparently real, 11: 15AM  
21 they're not just made up. Not just religious  
22 people do it. And I think it's the same thing  
23 in biology, more and more people are  
24 recognizing that area as well.  
25 Q. Do you think the State Board should make it as 11: 15AM  
0118  
1 a policy that Intelligent Design should not be  
2 allowed to be discussed in a science classroom?  
3 A. Oh, I would say in a science classroom if it  
4 comes up-- the subject of intelligent design  
5 comes up, I would revel with the chance of 11: 15AM  
6 having a discussion. Yes, that's great  
7 inquiry, discussion.  
8 UNIDENTIFIED SPEAKER: Time.  
9 MR. CALVERT: Thank you very much.  
10 Doctor Thaxton has provided the committee with 11: 16AM  
11 written testimony which covers some of the  
12 remarks that the time would not allow.  
13 CHAIRMAN ABRAMS: Mr. Irigonegaray,  
14 you have 20 minutes.  
15 MR. IRIGONEGARAY: Thank you. 11: 16AM  
16 CROSS EXAMINATION  
17 BY MR. IRIGONEGARAY:  
18 Q. Sir, I have just a few questions for you.  
19 First of all, what is your opinion as to what  
20 the age of the earth is? 11: 17AM  
21 A. My opinion-- it really wouldn't matter to me if

22 it was one hundred billion years old.  
23 Q. That wasn't my question.  
24 A. I don't know.  
25 Q. My question is, sir, what is your opinion as to 11:17AM  
0119 what the age of the earth is?  
2 A. Well, I generally say, when people ask me that,  
3 it's probably between 10 or 15 billion years  
4 old.  
5 Q. Between 10 and 15 billion years old? 11:17AM  
6 A. The universe.  
7 Q. I asked you about the earth.  
8 A. Oh, four-and-a-half million years.  
9 Q. Four-and-a-half million years. Do you believe  
10 in common descent? 11:17AM  
11 A. You mean, common ancestry?  
12 Q. Common descent, yes.  
13 A. Well, I have difficulty with common ancestry  
14 and maybe that's what you mean by common  
15 descent. 11:18AM  
16 Q. Do you believe in common descent in humans,  
17 such as the fact that there were perhomnids  
18 before homo sapiens?  
19 A. Are you asking me if I accept evolutionary  
20 thought on this? 11:18AM  
21 Q. I'm asking you if you accept prehomnids as the  
22 ancestral line to homo sapiens?  
23 A. Personally I don't, no.  
24 Q. You what?  
25 A. I personally do not. 11:18AM  
0120 Q. You do not?  
2 A. Yes. I mean, I'm not an expert on this. I  
3 don't study those things in terms like I have  
4 done this.  
5 Q. I understand. Do the science standards 11:18AM  
6 anywhere mention the word "atheism"?  
7 A. The ones I read did not.  
8 Q. Do the science standards anywhere use the word  
9 "materialism"?  
10 A. I don't see it. 11:18AM  
11 Q. Do the science standards anywhere use the term  
12 "humanism"?  
13 A. No, not to my knowledge.  
14 Q. Do the science standards anywhere use the term  
15 "unguided" or "undirected" or "accidental"? 11:19AM  
16 A. I don't recall seeing that.  
17 Q. Do the science standards anywhere limit the  
18 ability of teachers to discuss criticisms of  
19 evolution with their students?  
20 A. Do they prevent the teachers from discussing it 11:19AM  
21 with them you mean if--  
22 Q. Let me repeat the question so you're clear,  
23 sir. Do the standards limit the teachers' and  
24 students' ability to discuss criticism of  
25 evolution? 11:19AM  
0121 A. I don't think so, no.  
2 Q. Should, in your opinion, science include  
3 references to the supernatural?  
4 A. Oh, I don't believe so.  
5 Q. Should science include references to miracles? 11:19AM  
6 A. No, not as science, no.

7 Q. Should science in any way advance a theistic  
8 view?  
9 A. Atheistic view? 11: 20AM  
10 Q. Theistic.  
11 A. Well, not theistic and not atheistic.  
12 Q. Should science be absolutely neutral as it  
13 relates to theism?  
14 A. If it was possible.  
15 Q. Would you please tell us where specifically in 11: 20AM  
16 the standards is the origins of life addressed?  
17 A. Is the origin of life addressed in the  
18 standard?  
19 Q. That's what I'm asking, yes, sir.  
20 A. Well, I don't know that they are. 11: 20AM  
21 Q. All right.  
22 A. I'm here to suggest that they be put in.  
23 Q. Do the standards prohibit a teacher from  
24 bringing up in class the origins of life?  
25 A. No. 11: 21AM  
0122  
1 Q. Is there anything in the standards that would  
2 prevent a teacher from discussing the  
3 difficulties associated with research into the  
4 origins of life?  
5 A. A teacher? 11: 21AM  
6 Q. Let me repeat the question if you did not  
7 understand it.  
8 A. Well, I'm thinking about--  
9 Q. Is there anything in the standards--  
10 A. Oh. 11: 21AM  
11 Q. -- that would prevent a teacher from discussing  
12 the difficulties associated with research into  
13 the origin of life with his or her students?  
14 A. I don't know that it specifically addresses  
15 that. 11: 21AM  
16 Q. It is possible, is it not, pursuant to the  
17 standards for a teacher to discuss current  
18 research into the origins of life with a clear  
19 understanding that the field is still wide  
20 open? 11: 22AM  
21 A. I guess it's possible.  
22 Q. You would agree with, would you not, that the  
23 science standards provide a foundation for the  
24 development of a curriculum and they do not  
25 limit the scope of knowledge? 11: 22AM  
0123  
1 A. Well, I think they do limit the scope of  
2 knowledge.  
3 Q. In what manner, sir?  
4 A. They adopt the natural cause only perspective  
5 and I think that limits them. 11: 22AM  
6 Q. And you're suggesting that supernatural causes  
7 should be inserted?  
8 A. That's an example of precisely the kind of  
9 thinking that I said the majority report put in  
10 that I thought was the problem. 11: 22AM  
11 Q. Well, if it's limited to the natural and you  
12 suggest that that is inappropriate to limit it  
13 to natural, wouldn't logically that would  
14 require us to teach the supernatural?  
15 A. If you're talking about metaphysics, yes, but 11: 23AM  
16 we're not talking about metaphysics.  
17 Q. We're talking about science?

18 A. Natural does not mean naturalism unless you  
 19 exclude the possibility that-- not exclude, if  
 20 you say only natural causes are permitted that, 11: 23AM  
 21 in effect, is saying-- it's what's tacit  
 22 naturalism. Even though you haven't used it,  
 23 you're saying natural cause only.  
 24 Q. Sir, please don't put words in my mouth. I  
 25 have not used the word naturalism. Naturalism 11: 23AM  
 0124  
 1 is something completely different.  
 2 A. That's true.  
 3 Q. Naturalism implies that the individual with  
 4 that belief excludes the possibility of a God  
 5 in any process. I am talking about the natural 11: 23AM  
 6 process which is involved in science. Do you  
 7 believe that in an appropriate scientific  
 8 curriculum for the children of the State of  
 9 Kansas supernatural theistic opinions should be  
 10 included, yes or no? 11: 24AM  
 11 A. No.  
 12 Q. Is there any part of the curriculum that do not  
 13 allow children or teachers to criticize any  
 14 aspect of science?  
 15 A. Excuse me, will you repeat that again? 11: 24AM  
 16 Q. I'll be happy to. Is there anything in the  
 17 science standards that would not permit  
 18 teachers from criticizing with their students  
 19 any aspect of science?  
 20 A. No, I don't think so. 11: 24AM  
 21 Q. Is there anything in the standards that would  
 22 deny a teacher and student, if they chose to so  
 23 do, to discuss Intelligent Design?  
 24 A. You mean a student can probably ask a question.  
 25 Q. Listen to my question carefully. Is there 11: 25AM  
 0125  
 1 anything in the standards that would prohibit a  
 2 teacher from discussing Intelligent Design with  
 3 her students?  
 4 A. I think there is.  
 5 Q. Where? 11: 25AM  
 6 A. When it talks about natural cause only.  
 7 Q. Where it talks about natural cause only?  
 8 A. There are statements that I read in it that I--  
 9 Q. Would you show me specifically where you  
 10 suggest that that exists? 11: 25AM  
 11 A. I don't have it here with me. But if you want  
 12 to provide me, I can look.  
 13 Q. You're the witness, sir, I'm asking you. You  
 14 say that it limits it that it cannot be  
 15 discussed. 11: 25AM  
 16 A. I recall-- I recall reading in the standards  
 17 that the implication of a suggestion that we're  
 18 dealing only with natural processes and so it  
 19 is--  
 20 Q. Don't the standards also allow a teacher to 11: 25AM  
 21 discuss issues raised by students in the  
 22 classroom without denying them the opportunity  
 23 to do so?  
 24 A. They can ask questions, sure.  
 25 Q. Okay. And if they can ask questions isn't 11: 26AM  
 0126  
 1 Intelligent Design perhaps one of those  
 2 questions they could ask about?

3 A. And be in strict accordance with the  
4 guidelines.  
5 Q. The guidelines do allow for students and 11: 26AM  
6 teachers to discuss any criticism they may wish  
7 about science, correct?  
8 A. Yes.  
9 Q. And that would include Intelligent Design,  
10 correct? 11: 26AM  
11 A. Well, yeah, this is the troubling thing because  
12 the standards don't talk about Intelligent  
13 Design.  
14 Q. No, they don't. But the sciences do permit a  
15 broad range of activities, including questions 11: 26AM  
16 from children to their teachers, and there's  
17 nothing in the standards that says Intelligent  
18 Design cannot be included in that discussion,  
19 correct?  
20 A. That is correct. 11: 27AM  
21 Q. I wanted to go back for a moment to the DNA and  
22 its code. Is it your testimony that DNA is  
23 evidence of an Intelligent Design?  
24 A. No, that is it not my testimony. I am using it  
25 only as an illustration to show the error of 11: 27AM  
0127  
1 limiting to natural process only. The  
2 inference is to something other than natural  
3 process and what that is--  
4 Q. Yes, sir. I apologize, sir.  
5 A. I said and what that is is where my question 11: 27AM  
6 was. I'm suggesting that if you're going to go  
7 beyond that then you're dealing with matters  
8 that the guidelines don't want you to talk  
9 about.  
10 Q. You would agree with the proposition that 11: 28AM  
11 because we may not have an answer today that  
12 explains in a natural manner an issue, that we  
13 should not stop looking for a natural answer,  
14 you would agree with that, would you not?  
15 A. Well, I think we should look for natural 11: 28AM  
16 answers-- natural cause answers.  
17 Q. And you would agree with me that historically  
18 we have seen in our world significant problems  
19 when a theistic view is imposed on observations  
20 of the natural world, you would agree with 11: 28AM  
21 that, would you not?  
22 A. When you're talking about theism and the  
23 classroom then I'm saying that it is not part  
24 of the science program.  
25 Q. That wasn't my question. You would agree with 11: 29AM  
0128  
1 me that the world is replete with many  
2 occasions in which theistic views imposed on  
3 the scientific process have created significant  
4 concerns for humanity, correct?  
5 A. Concerns? 11: 29AM  
6 Q. Problems.  
7 A. Well, what do you mean by problems?  
8 Q. Do you-- can you think of any issues at all,  
9 based upon your knowledge, where theistic views  
10 either denied science to progress or punished 11: 29AM  
11 scientists for attempting to develop a natural  
12 explanation to that which was surrounding them?  
13 A. Well, in the history of science there's all

14 kinds of examples of those, yes.  
15 Q. In the history of-- 11: 29AM  
16 A. History of science.  
17 Q. You would agree with me, for example, at one  
18 point we believed that the earth was the center  
19 of the universe and everything revolved around  
20 us? 11: 30AM  
21 A. At one time, yes.  
22 Q. And you also would agree with me that at one  
23 time individuals that spoke out against that  
24 proposition were considered heretics, correct?  
25 A. It was defined as a heretical view, yes. 11: 30AM  
0129  
1 Q. And you would agree with me further, would you  
2 not, that through the process of science, the  
3 search for understanding of the natural  
4 processes around us, we've learned that the  
5 earth was not the center of the universe,  
6 correct? 11: 30AM  
7 A. Yes.  
8 Q. Correct?  
9 A. That's correct, yes, we learned that.  
10 Q. And you would agree with me that to have 11: 30AM  
11 allowed a theistic control of those processes  
12 would have stifled scientific growth?  
13 A. In that case it was Aristotelian, not theistic  
14 necessarily.  
15 Q. You will-- you would further agree with me, 11: 30AM  
16 would you not, that it is important to allow  
17 science therefore to remain absolutely neutral  
18 as it goes forth in attempting to find answers?  
19 A. That would be great.  
20 Q. And you would further agree with me that it is 11: 31AM  
21 totally unfair, inaccurate, inappropriate, and  
22 intellectually dishonest to paint all  
23 scientists with a broad brush that says  
24 unless-- unless they abandoned the natural  
25 process and accept design they are not really 11: 31AM  
0130  
1 Christians or able to have a theistic faith?  
2 A. There was a lot in that question, can you  
3 unpack it individually for me?  
4 Q. I have no further questions of you, sir. Thank  
5 you for being here. 11: 31AM  
6 EXAMINATION  
7 BY MS. MORRIS:  
8 Q. Hello, Doctor Thaxton.  
9 A. Hello.  
10 Q. Nice to have you here. Welcome to Kansas. 11: 32AM  
11 A. Thank you.  
12 Q. I'm an elementary teacher and I'm humbled by  
13 the intelligence before me, so bear with me.  
14 I'm a little confused about the prebiotic soup.  
15 Now, did I understand correctly that either-- 11: 32AM  
16 well, help me understand, either we don't have  
17 any-- we have no evidence of the soup or at  
18 best it was an unenergized diluted water?  
19 A. Yes, that was a little perhaps confusing  
20 because I had two different points on there. 11: 32AM  
21 No, there's no geologic evidence there was ever  
22 a soup, but all the theories talk about it.  
23 Q. Okay. So I can go out of here and people will  
24 say to me you've been saying there's evidence

25 that refutes the-- Darwin's theory of evolution 11: 33AM  
0131

1 and so I've been hoping these hearings would  
2 help me have some good hard evidence that I can  
3 repeat. So I can say with certainty there is  
4 no evidence of the prebiotic soup?

5 A. In all my reading and talking with experts 11: 33AM  
6 about it, I've never heard anyone say they have  
7 evidence of prebiotic soup. As far as I know  
8 there's plenty of statements to show that  
9 there's evidence it did not exist.

10 Q. Isn't that a critical problem for the theory of 11: 33AM  
11 evolution, didn't we need that nutrient rich  
12 muddy pond to--

13 A. Well, this is precisely one of the major  
14 factors that led some people to think life was  
15 dumped here by comets. 11: 33AM

16 Q. Great. Thank you.

# EXAMINATION

17 BY MS. MARTIN:

18 Q. Thank you. And I think part of the  
19 naturalistic view is in the induction under the 11: 34AM  
20 nature of science and that's where it comes  
21 out. So almost not allowing any other view  
22 would almost be not allowing this soup idea  
23 because it's not really naturalistic as far as  
24 I'm concerned. We can't see a soup in nature 11: 34AM  
25

0132  
1 acting now, so how can we allow it as a part of  
2 this theory even-- I mean, I just see a lot of  
3 complications here if we don't allow other  
4 things besides strictly naturalistic things.  
5 You have to use imperialism when you deal with 11: 34AM  
6 science and I'm not going to ever say that, but  
7 I think in the historical sciences we have used  
8 a lot of assumptions so that we have to be  
9 careful. And if we're going to keep it all to  
10 natural explanation maybe we have to get rid of 11: 34AM  
11 these assumptions that were made in historical  
12 science.

# EXAMINATION

13 BY CHAIRMAN ABRAMS:

14 Q. Regarding the chemical soup. 11: 34AM

15 A. Yeah.

16 Q. Generally that is thought to be-- from what I  
17 understand, it's generally thought to be a  
18 generally in a reducing atmosphere and that  
19 would be comprised of carbon monoxide, dioxide, 11: 35AM  
20 nitrogen, ammonia, and so forth. Am I  
21 understanding that correctly, is that what most  
22 theories propose?

23 A. Well, a reducing atmosphere would be one of  
24 methane ammonia, but overall it would be-- they 11: 35AM  
25

0133  
1 would say it needs to be reducing. In effect,  
2 if it's oxidizing you won't get the chemical  
3 reactions that Miller got in his reaction  
4 flasks. So he's done it with nitrogen and  
5 carbon dioxide and not much comes out of it, 11: 35AM  
6 not much in the way of productive things come  
7 from it.

8 That's why in the early days chemical  
9 evolution was much more positively received

10 than it is now, in my opinion, because they 11: 35AM  
 11 were dealing with methane and ammonia  
 12 atmosphere. But the difficulty with even that  
 13 atmosphere has been that there's no-- there's  
 14 no justifiable way to account for methane in  
 15 that atmosphere. So they've given it up and 11: 36AM  
 16 what would-- what would now they think be out  
 17 of the atmosphere might have been in it.  
 18 Pretty much the same kind of thing that comes  
 19 from volcanos today, mainly carbon dioxide,  
 20 water, nitrogen, but not-- but not methane and 11: 36AM  
 21 ammonia.  
 22 Q. With that in mind, then the energy that might  
 23 be associated with that might be from UV light.  
 24 Is that correct?  
 25 A. Yes, they still hold that view. That's still 11: 36AM  
 0134 correct.  
 1 Q. But in the presence of UV light what happens to  
 2 the organisms that might be formed?  
 3 A. Well, according to the theory, by the time  
 4 organisms themselves would have formed, if 11: 36AM  
 5 they-- if they formed immediately they'd be  
 6 destroyed because of all that ultraviolet  
 7 light. There's kind of a conundrum there, an  
 8 enigma. There needs to be some way to generate  
 9 an ozone layer to protect the living organism 11: 37AM  
 10 from lethal rays of ultraviolet, but not before  
 11 it has time to form. So that's a problem also.  
 12 And you don't have an ozone layer unless you  
 13 have oxygen and where does the oxygen come  
 14 from. So that's been a difficulty. 11: 37AM  
 15 Q. That's my point about that is that obviously  
 16 oxygen has problems with the reducing  
 17 atmosphere and also the UV light not only is  
 18 the source of it, but also destroys it without  
 19 the ozone and that is an increase in oxygen in 11: 37AM  
 20 that layer up there. So you're correct in my  
 21 understanding also of what I read is that that  
 22 is a conundrum.  
 23 I'd like to talk also about the idea of  
 24 science, the best way to avoid bias. And I 11: 37AM  
 25  
 0135 have been a proponent of imperial science as  
 1 defined by observable, measurable, testable,  
 2 repeatable, and falsifiable. And is that  
 3 something you believe is in the realm of good  
 4 science? 11: 38AM  
 5 A. Oh, yes, I do. Difficulty in practice over the  
 6 years, however, in dealing with any-- any  
 7 subject like chemical evolution has a time  
 8 component to it where you're extrapolating from  
 9 what we see in the lab today to the past. And 11: 38AM  
 10 the problem is that you can have-- the best you  
 11 can ever achieve is a highly plausible theory.  
 12 Highly plausible theories may not be accurate,  
 13 but they can be an indicator of what probably  
 14 took place. And so that's the reason why, 11: 38AM  
 15 technically speaking, falsifiability doesn't  
 16 work. You cannot disprove something unless you  
 17 can test it. But you can-- this is what we  
 18 wrote had-- we had to persuade a lot of people  
 19 that there's legitimacy to the field of 11: 38AM  
 20



21 chemical evolution because it deals with events  
22 you hypothesize that took place three to four  
23 billion years ago. So how can you do that if  
24 you can't disprove it? You can possibly  
25 generate a plausible scenario of what did 11: 39AM

0136

1 happen. And then the experiment in the  
2 laboratory today may give credibility or add  
3 plausibility to that.

4 What I'm suggesting is that I think the  
5 students and the curriculum need to know about 11: 39AM  
6 it, the possibility, in fact, what has happened  
7 is that more and more of these experiments have  
8 been done, you narrow the speculation down  
9 because of your new knowledge. And so I would

10 say the chemical evolution theory is highly 11: 39AM  
11 implausible rather than plausible, but not  
12 falsified.

13 Q. But that's also the reason that is-- going back  
14 to the science curriculum standards, that you  
15 are suggesting that the critical analysis of 11: 39AM  
16 biological evolution, chemical evolution is a  
17 good thing to do?

18 A. Yes, exactly.

19 Q. Okay. Thank you very much.

20 A. You're welcome. 11: 40AM

21 CHAIRMAN ABRAMS: We're going to  
22 break for lunch. We will return at about  
23 12: 55. Please wait, do not leave, I have an  
24 announcement. Those participant screenings via  
25 metal detectors was a precautionary measure we 11: 40AM

0137

1 had considered in the planning of this hearing.  
2 At the time we had-- didn't know anything about  
3 any problems, but for the safety and security  
4 of the participants and the audience Capital  
5 Police will have metal detectors stationed 11: 40AM  
6 outside the auditorium throughout the remainder  
7 of the hearings. We expect them to be here by  
8 about 12: 30. So all people coming back after  
9 lunch will go through the metal detectors.  
10 Please expect some delays. Thank you. 11: 40AM

11 (THEREUPON, a luncheon recess was  
12 had).

13 CHAIRMAN ABRAMS: If I could have  
14 your attention, please. We're getting ready to  
15 get started with the afternoon session. 01: 01PM

16 Another announcement, I might mention that if  
17 you leave if you leave by any door you must be  
18 rescanned every time you re-enter. Sorry that  
19 has to happen, but that's the order of the  
20 Capital Police. Therefore, I would ask you to 01: 01PM

21 try to be efficient this afternoon regarding  
22 the bathrooms. If any possibility of  
23 staggering, that would be good. But also--  
24 also we're going to extend our intermission ten  
25 minutes. We were scheduled from 3: 30 to 3: 40, 01: 01PM

0138

1 we're going to extend that to 20 minutes, 3: 30  
2 to 3: 50 in an effort to accommodate that.  
3 Therefore, we'll also extend the other two  
4 sessions after that by ten minutes as needed.  
5 And I thank you for your perseverance. Mr. 01: 02PM

Calvert.

MR. CALVERT: Thank you.

JONATHAN WELLS, PhD,  
called as a witness on behalf of the Minority  
testified as follows:

DIRECT EXAMINATION

BY MR. CALVERT:

Q. Doctor Abrams, members of the committee, I'd like to introduce to you Doctor Jonathan Wells. Doctor Wells, has come from the State of Washington. Where do you live there. 01: 02PM

A. I live near Bucoda Sound, northwest corner of Washington State. 01: 02PM

Q. I really appreciate your coming all this way to talk about the issue. To get started, Doctor Wells, would you please explain a bit about your background and your occupation at the time of the Minority Report. And in particular I 01: 03PM

believe you're going to be addressing the evolution benchmark at standard three, benchmark three, at grades eight through twelve?

A. Yes, thank you for inviting me. I earned a bachelor's degree in physical science, which included mostly physics and geology in the late '60s from the University of California at Berkeley. Went on to get a Ph.D. in religious studies at Yale in the '70s and early '80s. And did my research there on the 19th century Darwinian controversies, the religious and theological. 01: 03PM

A few years after that because of my interest in the Darwinian controversy, I went back to school, proof that I'm actually certifiably insane if you want to know the truth. Maybe I shouldn't make jokes here. That's what people told me at the time. I went back and got a second Ph.D. in biology, molecular and cell biology, again at the University of California at Berkeley where I focused on embryology and evolution. 01: 04PM

Since then I have worked as a supervisor of a medical laboratory in California for a 01: 04PM

while. Then was asked to come up to Seattle as a senior fellow at the Discovery Institute there.

Q. Could you tell us a bit about the Discovery Institute and your relationship to it now? 01: 04PM

A. The Discovery Institute is a public policy institute, not for profit institute. It actually preexisted the current controversy. It has projects that focus on regional cooperation between Oregon and Washington and British Columbia, specifically transportation issues, fishery issues, technology issues. 01: 04PM

And in 1996 the center for science and culture was founded at Discovery Institute specifically to address the Darwinian controversy in public education. And I was 01: 05PM

17 invited to come up then as a senior fellow.  
 18 Which is where I am now, I moved up in '98 with  
 19 my family. I'm not an employee of the  
 20 Discovery Institute. I receive a research 01: 05PM  
 21 grant for which no goods or services are  
 22 required. But obviously my interest in the  
 23 institute-- (reporter interruption). I have a  
 24 fellowship-- a research fellowship in Discovery  
 25 Institute, which does not require goods or 01: 05PM  
 0141  
 1 services, so I'm not an employee. But the  
 2 research I do is obviously of interest to the  
 3 institute.  
 4 Q. Could you describe a bit of that research?  
 5 A. Specifically in-- probably notoriously in 2000 01: 05PM  
 6 I published a book "Icons of Evolution", in  
 7 which I showed many of the major images used in  
 8 biology textbooks as evidence for evolution and  
 9 the facts do not fit the evidence.  
 10 I first discovered-- the one I first 01: 06PM  
 11 discovered was the picture of embryos, which  
 12 I'll talk about in a few minutes, because I was  
 13 studying embryology. And I would compare  
 14 pictures with the embryos I was actually  
 15 looking at and realized there's a discordance 01: 06PM  
 16 there. And I went on from there to study  
 17 various other icons and found similar  
 18 discrepancies between the icon and the  
 19 evidence.  
 20 Q. In your program I guess you will tell us what 01: 06PM  
 21 an icon is?  
 22 A. Well, I call them icons because they're  
 23 pictures, first of all. They're pictures that  
 24 have taken on an aura that goes far beyond  
 25 their evidentiary value. They become symbols 01: 07PM  
 0142  
 1 almost of evolutionary theory. And in that  
 2 sense of almost iconic status. That's why I  
 3 call them icons.  
 4 Q. Now, your book was published 2000?  
 5 A. Yes. Revised slightly in 2002. 01: 07PM  
 6 Q. And I believe it has been reviewed by a number  
 7 of different people, scientists. Is that  
 8 correct?  
 9 A. Yes, it has. The number of published reviews  
 10 is probably somewhere around a dozen, of which 01: 07PM  
 11 roughly half are favorable and half are  
 12 extremely unfavorable.  
 13 Q. What about the unfavorable reviews?  
 14 A. Well, I responded to them in an article I  
 15 posted on the Discovery web site a few years 01: 07PM  
 16 ago called "Critics Rave Over Icons of  
 17 Evolution," because they were raving reviews in  
 18 the sense that they were extremely angry with  
 19 me. And I hope I showed them in that response  
 20 that on a scientific level nobody has actually 01: 08PM  
 21 rebutted the claims I made. Instead typically  
 22 what happens is my credentials are impugned, my  
 23 integrity is attacked, and various other  
 24 things. It's a campaign more of character  
 25 assassination than dealing with the evidence. 01: 08PM  
 0143  
 1 Q. I have also heard the argument that even though

2 icons themselves may be incorrect in various  
3 cases they still represent deep fundamental  
4 truths. Is that the criticism that's been  
5 made? 01: 08PM

6 A. Yes, it has. But I try to be very careful in  
7 my book to say exactly why the icons are wrong.  
8 For example, the peppered moth icon, which to  
9 be specific has the peppered moth resting on a  
10 tree trunk where we now know they don't 01: 09PM  
11 normally rest, is used as evidence for natural  
12 selection. Well, I have no quarrel with  
13 natural selection, so I'm not saying that the  
14 falsity of that icon refutes natural selection.  
15 But for each icon that I deal with what I 01: 09PM  
16 do say, and I think legitimately, is that if  
17 this is sought or presented as some of the best  
18 evidence we have for Darwinian evolution and so  
19 much of it is false, where does that leave the  
20 theory. Because sooner or later if a theory is 01: 09PM  
21 going to be scientific if you have to test it  
22 against the evidence. And if piece after piece  
23 of that evidence turns out to be exaggerated or  
24 distorted or even fake, then I think the theory  
25 itself at some point becomes suspect. 01: 09PM

0144  
1 Q. Your criticisms in "Icons of Evolution", and  
2 I've read the book, tend to weaken evolutionary  
3 theory, would you agree with that?  
4 A. The evidence is what weakens evolutionary  
5 theory. 01: 10PM  
6 Q. Is that--  
7 A. I have no desire to weaken any theory except by  
8 comparing the evidence. What I don't want to  
9 weaken is science, because science thrives on  
10 comparing the theory of evidence. 01: 10PM  
11 Q. Do you believe science education should oppose  
12 curriculum that has the effect-- whether  
13 intended or not, has the effect of weakening  
14 evolution or putting it in a bad light?  
15 A. Well, I'm certainly no supporter of weakening 01: 10PM  
16 the treatment of evolution in science  
17 curriculum. In fact, I think if anything a  
18 student should learn more about evolution than  
19 they're currently being taught. They need to  
20 be taught the theory more clearly, they need to 01: 10PM  
21 be taught the evidence for it, and the evidence  
22 against it. And in most cases often I see a  
23 rather superficial treatment of evolution that  
24 doesn't really get into the issues. And I find  
25 the issues extremely interesting. And my 01: 11PM

0145  
1 experience-- my limited experiences with  
2 students is that they find it interesting too.  
3 Q. You've read the Minority Report?  
4 A. I have.  
5 Q. And what is your overall assessment of the 01: 11PM  
6 proposals in that report?  
7 A. My overall assessment is that it improves the  
8 set of standards that were on the table before  
9 the Minority Report because it raises issues  
10 that I think are important to raise in the 01: 11PM  
11 science classroom.  
12 Q. Regarding the definition science, one of the

13 proposed changes in the Minority Report is to  
14 substitute the definition of science that was  
15 very similar to a definition adopted in Ohio. 01: 11PM  
16 And I believe you're familiar with that  
17 definition. I wanted you to comment on that  
18 and I will put that up on the screen here.  
19 There it is. The Minority Report-- oops. It  
20 may be a bit hard for you to read that. Okay. 01: 12PM  
21 The definition of science is a systematic  
22 method of continuing investigation that uses  
23 observations, hypotheses, testing, measurement,  
24 experimentation, logical argument, and theory  
25 building to lead to more adequate explanations 01: 12PM  
0146  
1 of natural phenomenon. Maybe you could comment  
2 on that definition?  
3 A. Well, I will and I'll comment also on the  
4 statement that it's replacing up there, namely  
5 science is the human activity of seeking 01: 13PM  
6 natural explanations for what we observe in the  
7 world around us.  
8 I realize that there's room for a lot of  
9 controversy on a topic like this, so my first  
10 tendency in a situation like this is to go look 01: 13PM  
11 for data. So I went looking at the science  
12 standards for every state in the United States.  
13 I literally spent two days glued to my  
14 computer, not very healthy, but I found the  
15 science standards or what I could find for all 01: 13PM  
16 50 states. And I was actually somewhat  
17 surprised to learn when I did that that in  
18 defining science as the human activity of  
19 seeking natural explanations, namely to mention  
20 the majority view, is absolutely unique in the 01: 13PM  
21 United States. There is no other state in the  
22 union that defines science that way.  
23 In fact, what I found, if I could hold  
24 this up for the Board, the yellow states have  
25 no explicit definition of science that I could 01: 14PM  
0147  
1 find on the internet. The green states all  
2 define science in terms of a process, a process  
3 of inquiry, formulating hypothesis, seeking  
4 evidence, testing the hypothesis against the  
5 evidence to find better explanations for 01: 14PM  
6 potential world phenomenon. In this sentence  
7 the Kansas definition that proceeded this  
8 controversy was idiosyncratic. No other state  
9 has that definition. No other state gives  
10 priority to the explanation we're supposed to 01: 14PM  
11 find. Every one else gives priority to the  
12 process.  
13 In this sense the minority view, in my  
14 opinion, is actually putting Kansas back in the  
15 mainstream of American science education. And 01: 14PM  
16 as a scientist myself-- and I have the data  
17 here which I'll hand that to you later, as a  
18 scientist myself I hear this. I would not like  
19 to see science become an enterprise where we're  
20 told at the outset what sorts of explanations 01: 15PM  
21 we're supposed to find. For me science is an  
22 exciting, open ended search for truth. And the  
23 way that's conducted is through hypothesis

24 testing. And I think the minority view  
25 replacement definition here is much more in 01: 15PM

0148

1 line with that than the definition of science  
2 as seeking natural explanations.

3 Q. Doctor Wells, I'd like to turn now to the  
4 evolution benchmark. There we go.

5 A. I want to get a quick drink. 01: 16PM

6 Q. Okay. This is the benchmark that you're going  
7 to talk about and that you have a power point  
8 presentation to cover?

9 A. Yes, if that's okay. The reason I'm using  
10 power point is because so much of this is 01: 16PM  
11 visual, which is why I wrote about icons.

12 So this is the part of the benchmark that  
13 I will specifically focus on in the power  
14 point. Namely the view that all living  
15 things-- the view that living things in all 01: 17PM  
16 major kingdoms are modified descendants of a  
17 common ancestor. Now, Darwin's theory-- now,

18 I'm going to be speaking here today about  
19 Darwinian evolution. Evolution as we've  
20 already heard is a very broad concept. And I'm 01: 17PM  
21 specifically addressing Darwin's theory namely  
22 that living things are modified descendants of  
23 creatures that lived in the very distant past.

24 Descendent modification is what Darwin called  
25 this theory. 01: 17PM

0149

1 The modification Darwin thought was due  
2 primarily to natural selection acting on random  
3 variations which the modern version of Darwin  
4 come from genetic mutation. So in a nutshell  
5 that's the theory I'm addressing here. 01: 17PM  
6 The only figure in Darwin's book, "The  
7 Origin of Species" is this one. And by it he  
8 meant to illustrate what he meant by his  
9 theory. So in the distant past we might have a  
10 small species down here. He drew two here that 01: 18PM  
11 converge further down. We have a species here  
12 that has a variety of forms in it. Two parts  
13 of this population might get separated and one  
14 form would go this way, the other form would go  
15 that way and eventually split into two species. 01: 18PM  
16 Further down the road the differences might be  
17 greater. Instead of two species we might have  
18 two genre or families or orders or classes or  
19 right up to the highest levels of the  
20 biological hierarchy. 01: 18PM

21 Now, no one doubts common ancestry at the  
22 level of the species. I have no problem  
23 believing that all of us in this room somewhere  
24 in the distant past shared a common ancestor.  
25 But is it true at higher levels? Are all the 01: 18PM

0150

1 different types of animals related by common  
2 ancestry, for example. Do we share a common  
3 ancestor with a worm or a fly? That's the  
4 question I'm going to address here. And we  
5 have to address questions like this in science 01: 19PM  
6 by looking at the evidence. So of all the  
7 levels that we could look at, I'm choosing  
8 this-- actually we already know that there's

9 substantial doubt about the one above it. But  
10 I'm going to look at the animal phylum, it's 01: 19PM  
11 the phylum institute that includes-- it would  
12 be us and mammals and the alligators and the  
13 fish. Another phylum would be the phylum that  
14 includes sea urchins and sea stars, another one  
15 would be the mollusks or the snails and the 01: 19PM  
16 squids and so on and so on. So these are the  
17 phyla, plural, the major different kinds of  
18 animals.  
19 Now, according to the benchmark, this is  
20 proposed to be added by the Minority Report. 01: 20PM  
21 Okay. This view that the major kingdoms I'm  
22 actually dealing with phyla, which is a smaller  
23 kingdom, are modified descendents of a common  
24 ancestor has been challenged in recent years by  
25 three things. Molecular evidence, fossil 01: 20PM  
0151  
1 evidence, and embryo evidence. And I'll deal  
2 briefly with all three of those.  
3 First, molecular evidence. I'm going to  
4 pick just to illustrate this seven phyla, seven  
5 major groups. We're in the chordate group, 01: 20PM  
6 here are the starfish, these are flatworms,  
7 roundworms, mollusks, arthropods which include  
8 the crabs and the insects and earthworms.  
9 Now, if we look at the molecules in these  
10 organisms and we group them according to the 01: 20PM  
11 similarity of their molecules we can rearrange  
12 them, thus. So these-- the molecules here are  
13 most similar-- they're more similar to each  
14 other than they are to these, for example. 01: 21PM  
15 These are more similar than they are to those.  
16 So we can regroup these according to the  
17 similarities in this particular molecule, which  
18 I won't try to describe in technical detail,  
19 but it's the one commonly used.  
20 Now, if we construct a tree, an 01: 21PM  
21 evolutionary tree following Darwin's pattern  
22 passed on this molecule, we get something like  
23 this. But the-- clear that the only data we  
24 have are up here. We have the molecules from  
25 these organisms and the rest of this is 01: 21PM  
0152  
1 inferred based upon the assumption that they  
2 share a common ancestor. What's interesting is  
3 when we look at these molecules various  
4 discrepancies immediately appear. For example,  
5 the tree I just showed you from 18sRNA doesn't 01: 21PM  
6 fit the classical tree that had been shown on  
7 the base of morphology or anatomy. Animals  
8 that are close together up here are far apart  
9 over here. Not only that, if I pick a  
10 different molecule 28sRNA, I get a different 01: 22PM  
11 tree again. Here's the 18s tree, here's the  
12 28s tree. Okay. Once again, animals that are  
13 closely related by one are not closely related  
14 by another.  
15 Imagine that you found out that your 01: 22PM  
16 grandfather was not the least bit related to  
17 you, but-- you know, related to people half a  
18 world away. This is pretty fundamental biology  
19 stuff, you know, it matters who you're related

20 to. Even worse if we take the 18sRNA and 01: 22PM  
 21 submit it two different laboratories, as it was  
 22 done in this case, again, we get two different  
 23 trees. So the molecular evidence is shot  
 24 through and through with discrepancies.

25 A recent article in Nature just last week 01: 22PM  
 0153

1 shows that this controversy is continuing.  
 2 These trees here, it shows these two trees in  
 3 nature. Here, we, the chordates are most  
 4 closely related to the arthropods or the  
 5 insects, but according to this other molecular 01: 23PM  
 6 study we're way off here and the insects are  
 7 more closely related to roundworms. These are  
 8 not trivial issues in evolutionary biology.

9 So the inconsistency in the evolution  
 10 tree based on molecular comparisons have to 01: 23PM  
 11 actually be explained away in the light of  
 12 evolution theory. They actually don't provide  
 13 evidence for the theory. I'm not saying the  
 14 theory is proven false, but this certainly  
 15 doesn't provide evidence for it. 01: 23PM

16 Now, according to reviewer Wiley, who  
 17 reviewed the Minority Report, these  
 18 discrepancies do not challenge the view that  
 19 all living organisms are related through common  
 20 ancestry. Reviewer Bartlett wrote something 01: 23PM  
 21 very similar. And while I can't necessarily  
 22 prove them wrong-- I mean, maybe we really all  
 23 are related to a common ancestry and just  
 24 haven't figured out how to make the molecules  
 25 tell us the true story. At the very least we 01: 24PM

0154  
 1 can only say this based on some other form of  
 2 evidence. We're not getting it from the  
 3 molecules.

4 So what other forms of evidence do we  
 5 have? Well, the other two forms generally 01: 24PM  
 6 proposed are the fossil evidence and the  
 7 embryology evidence. So that's what I'll talk  
 8 about next, the fossil record. According to  
 9 the Minority Report sudden bursts of increased  
 10 complexity, such as the Cambrian Explosion, 01: 24PM  
 11 challenge the Darwinian view that we're all  
 12 related through common ancestry.

13 Now, in Darwin's theory - this is a very  
 14 simplified cartoon of it - the phyla that I  
 15 showed you a few minutes ago are up here and if 01: 24PM  
 16 we had good fossil record, which, of course, we  
 17 don't, we would expect to find something like  
 18 this in the past where these branch off somehow  
 19 to the common ancestry which might be, for  
 20 example, some form of worm. Ideally this is 01: 25PM  
 21 what we would expect. When we go looking at  
 22 the fossil record what we found instead is  
 23 this. Most of the major animal phyla appear  
 24 abruptly, theologically speaking, in the  
 25 Cambrian Explosion, with no fossil evidence 01: 25PM

0155  
 1 that might actually be from a common ancestor.  
 2 Theory versus evidence.

3 Now, remember common ancestry might be  
 4 true at lower levels, but at this level, the



5 level of the animal phyla, the fossil evidence 01: 25PM  
6 certainly isn't helping us. Darwin himself  
7 recognized this. He said this actually  
8 presented a serious problem, a valid argument,  
9 I'm sorry. To suddenly appear in the Cambrian  
10 must remain inexplicable and may be truly urged 01: 25PM  
11 as a valid argument against the views of common  
12 ancestry. I would argue as a biologist that  
13 the problem has not been solved in the 150  
14 years, at least not in the fossil evidence.  
15 Now, reviewer Wiley criticized people who 01: 26PM  
16 think the Cambrian Explosion is a big deal. He  
17 says it is not. And they, myself I guess,  
18 would know this if they actually examined the  
19 recent literature. Well, I have examined the  
20 recent literature. For example, Wiley cites 01: 26PM  
21 two articles in 1996 that rely on molecular  
22 studies - there we are back to that - to date  
23 the original divergence of the animal phyla to  
24 about 12 hundred million years ago or about  
25 seven hundred million years before the Cambrian 01: 26PM  
0156  
1 Explosion. The problem is other molecular  
2 studies true to form come up with a very  
3 different answer and give us a date much closer  
4 to the fossil record. According to Berkeley  
5 paleontologist James Valentine and his 01: 26PM  
6 colleagues-- now, these are not Intelligent  
7 Design proponents these are not creationists,  
8 these are actually not even people who doubt  
9 Darwin's theory in a larger sense, but these  
10 paleontologists who are experts on the evidence 01: 27PM  
11 say the accuracy of molecular clock is still  
12 problematic, at least for the phyla since the  
13 estimates vary by hundreds of millions of years  
14 depending on the techniques use. So they do  
15 not muffle the Cambrian Explosion which 01: 27PM  
16 continues to stand out as a major feature in  
17 animal evolution contrary to reviewer Wiley.  
18 Reviewer Wiley then cites two other  
19 articles reporting fossil evidence for animals  
20 before the Cambrian Explosion. What's 01: 27PM  
21 interesting is one of the articles he lists is  
22 considered an extremely dubious interpretation  
23 of fragmentary data by other experts in the  
24 field. The second article is, at best,  
25 controversial. So here we have two articles, 01: 27PM  
0157  
1 dubious and controversial, up against literally  
2 hundreds of articles documenting the dramatic  
3 and extensive nature of the Cambrian Explosion  
4 and we're supposed to accept the Cambrian  
5 Explosion based on these two articles. Well, 01: 28PM  
6 I'm not persuaded. Clearly Darwin's theory of  
7 life does not fit the fossil evidence for the  
8 origin of the major groups of animals.  
9 Finally, number three, embryology. I  
10 love this part because I'm an embryologist 01: 28PM  
11 primarily. For Darwin the best evidence to his  
12 theory was embryology. He said the embryos are  
13 the most distinct species belonging to the same  
14 class, such as mammals are closely similar, but  
15 become, when fully developed, largely 01: 28PM

16 dissimilar. This is by far the strongest  
 17 single class of facts in favor of my theory.  
 18 Actually by class in that point Darwin meant  
 19 phyla. And to illustrate a colleague of his in  
 20 Germany, Ernest Haeckel, made this drawing in 01: 29PM  
 21 1868. And many of you, I'm sure, have seen it  
 22 or some version of it. Here's a salamander--  
 23 I'm sorry, a fish, a salamander, a turtle, a  
 24 chick, four mammals. And in Haeckel's drawing  
 25 they all look almost identical in their early 01: 29PM

0158  
 1 stages. And the lesson from this that Haeckel  
 2 drew and Darwin himself drew is that this shows  
 3 all of these share a common ancestor. And, in  
 4 fact, to Darwin the common ancestor probably  
 5 looked something like that. The problem is 01: 29PM  
 6 Haeckel faked his drawings. He was known to  
 7 have faked his drawings. At the time his  
 8 colleagues accused him of fraud. If you look  
 9 at the actual fish, amphibian, turtle, chick,  
 10 human embryos if you look at them at this stage 01: 29PM  
 11 and draw them from life they look more like  
 12 that. This is what I saw as a Berkeley  
 13 graduate student and realized there was  
 14 something wrong here.

15 Well, reviewer Miller, when he comments 01: 30PM  
 16 on this part of the standards, admits that the  
 17 earlier embryonic stages were incorrect. And  
 18 he says textbooks have long been corrected now  
 19 to reflect Richardson's observations. Well,  
 20 Miller did correct his book somewhat. I'll get 01: 30PM  
 21 back to that in just a minute. But here are  
 22 two textbooks from 2004. Biology textbooks  
 23 copyright dates 2004 and there are Haeckel's  
 24 embryos. Here's a biochemistry textbook from  
 25 2004, this is for graduate students. Well, 01: 30PM

0159  
 1 maybe not. Upper division undergraduates  
 2 perhaps. And there are Haeckel's embryos. So,  
 3 yes, they have been removed from some  
 4 textbooks, but certainly not from all.  
 5 Reviewer Theobald says that it's true 01: 30PM  
 6 that the embryos were fake, but that does not  
 7 invalidate the fact that development is more  
 8 similar between two animals the more recent is  
 9 the common ancestor between them. In other  
 10 words, the main point is still true according 01: 31PM  
 11 to Theobald. Wiley takes a similar view. The  
 12 more recent the common ancestor, the more  
 13 similar the development. And reviewer Miller  
 14 likewise argues that the principle is true even  
 15 if the drawings are wrong. And Miller then 01: 31PM  
 16 takes the Minority Report to test for telling  
 17 students that vertebrate embryos differ in ways  
 18 that they do not.

19 Well, here's the picture from Miller's  
 20 book. He uses photographs. He certainly 01: 31PM  
 21 cannot be accused of faking drawings here. In  
 22 the early stages of development chickens,  
 23 turtles, and rats look similar to providing  
 24 evidence that they shared a common ancestor.  
 25 So the principle for Miller is still true. But 01: 31PM

0160

1 let's take a closer look at the evidence.  
2 Choosing embryos only from certain classes and  
3 then distorting them to make them look similar  
4 is not Haeckel's main fault. Even more  
5 significantly he didn't even show the earlier 01: 32PM  
6 stages of vertebra embryos, he started in the  
7 middle. If you look at the earlier stages of  
8 vertebra embryos, here's the stage that Haeckel  
9 made look very similar. If you look at earlier  
10 stages the patterns are extremely diversional. 01: 32PM  
11 Mammals, for example, begin their cell division  
12 in a way total radically different from the  
13 other classes. So instead of-- and here's a  
14 comment from a Dartmouth embryologist to that  
15 effect this is not a secret, it's only by 01: 32PM  
16 semantic tricks and subjective selection of  
17 evidence by bending the facts of nature that  
18 one can argue that the earliest stages of  
19 vertebrate embryos are similar when they're  
20 adults. Instead what we really have with the  
21 evidence is what is now called, by  
22 developmental biologists, the developmental  
23 hourglass. Okay. The embryos start out very  
24 different, they converge in the middle for  
25 reasons we do not understand and then they 01: 32PM  
0161  
1 diverge again as they grow older. Well,  
2 remember Miller's pictures, these are photos  
3 now that can't be accused of being doctored.  
4 But look at where he got them. He picked  
5 three-- the three most similar of these five 01: 33PM  
6 embryos and left these out, picked the three  
7 most similar at this stage where they're the  
8 most similar and he called this the earlier  
9 stages and then he accuses the Minority Report  
10 of telling students that embryos are more-- are 01: 33PM  
11 less similar than they really are.  
12 Now, here's another textbook-- I honestly  
13 don't know if Miller's book is in use in  
14 Kansas, but I know this one is. This is  
15 "Biology, The Dynamics of Life." I'm sorry 01: 33PM  
16 that's next. This one here-- I don't have the  
17 book with me, but Campbell, Williamson, and  
18 Heyden has this set of pictures. Well, same  
19 thing again. These are taken from the two most  
20 similar at this stage and represented as 01: 33PM  
21 evidence that embryos are most similar in their  
22 early stages, which is absolutely false.  
23 I was going to hold another book up which  
24 does the same thing, but I think the point is  
25 made. So I'll summarize recent challenges to 01: 34PM  
0162  
1 universal common ancestry molecular data do not  
2 yield the consistent pattern of evolutionary  
3 relationship. Fossil records of the Cambrian  
4 Explosion certainly do not fit the branching  
5 tree patterns of Darwin's theory. And embryos 01: 34PM  
6 are not most similar in their earliest stages.  
7 So my conclusion is there are discrepancies  
8 between Darwin's theory of evolution and the  
9 evidence from molecules, fossils, and embryos.  
10 Science students should know about them. Thank 01: 34PM  
11 you.

12 Q. Doctor Wells, sort of a follow-up question,  
13 the-- I believe that it's indicator 1 F that  
14 you did your power point slide discovered. Do  
15 you agree all living things in all natures  
16 kingdom--  
17 A. Yes, F 1, 2, and 3.  
18 Q. Yeah. Now, would you comment on the scientific  
19 validity of-- in 1 F, 1, 2, and 3?  
20 A. The Minority Report's proposal? 01: 35PM  
21 Q. Yeah.  
22 A. Well, certainly the evidence supports them. I  
23 mean, there may be a pedagogical question  
24 should high school students be exposed to this.  
25 But given the-- usually the way Darwin 01: 35PM  
0163  
1 evolution is often presented as though there's  
2 overwhelming evidence for it and no dispute  
3 about it. Clearly that's not the case. So I  
4 do think students should be exposed at least in  
5 outline to these problems. 01: 35PM  
6 Q. Would it be fair to say that exposing students  
7 to this information would improve their  
8 understanding in biological evolution? And  
9 when I say understanding, understanding in  
10 terms of comprehension, being able to 01: 36PM  
11 comprehend the subtleties of the theory so it  
12 can be more reasonable?  
13 A. Well, remember I didn't use the term biological  
14 evolution. I used the term Darwinian  
15 evolution. If by biological evolution you mean 01: 36PM  
16 the facts that we see that living things are  
17 different now than they used to be, this  
18 evidence certainly increases the students  
19 knowledge of that pattern of difference. What  
20 does it do to Darwin's theory? Well, I think 01: 36PM  
21 it weakens Darwin's theory. The evidence  
22 weakens Darwin's theory. But for science  
23 that's good. If the theory doesn't explain the  
24 evidence then it should be weakened in the eyes  
25 of the students. They shouldn't be told 01: 36PM  
0164  
1 something explains evidence that isn't there.  
2 They should be aware of the evidence.  
3 Q. We were just talking about the definition of  
4 evolution and I'd like to take your attention  
5 up to indicator 1 A where the Minority Report 01: 37PM  
6 adds a couple of sentences to the definition of  
7 biological evolution and ask you to comment on  
8 the additional-- two additional sentences in  
9 indicator-- additional specificity on 1 A?  
10 A. Well, honestly I would not call it biological 01: 37PM  
11 evolution there because to me that term is too  
12 broad. I would have written that Darwinian  
13 evolution or Darwin's theory of evolution. And  
14 if it were written that way I would say it's  
15 absolutely true, at least in Darwin's mind. 01: 37PM  
16 Remember my first Ph.D. was on the 19th century  
17 controversies and I actually wrote a book about  
18 Darwin's view of teleology and guided  
19 evolution. It was very clear that the process  
20 of evolution was unguided. If by biological 01: 37PM  
21 evolution you mean Darwinian evolution, this is  
22 a fact, historical fact.

23 Q. So if you were to substitute the word  
24 "Darwinian evolution" in your opinion anyway,  
25 the statement would be a scientifically valid 01: 38PM  
0165 statement?  
1  
2 A. Historically true, yes. And that's not just  
3 Darwin himself, but his followers with various  
4 exceptions. Am I through?  
5 Q. I have some more questions of you. Okay. In 01: 38PM  
6 indicator 3 D there's a discussion of micro and  
7 macroevolution and a distinction is made in the  
8 Minority Report, which you would not find in  
9 the mainstream report. My first question is  
10 whether it is appropriate to make the 01: 39PM  
11 distinction between micro and macroevolution  
12 changes and then whether 1 D, in your view, is  
13 a scientifically valid teaching?  
14 A. Well, I was fascinated to read the review by  
15 Hurd. Hurd wrote in his peer review of the 01: 39PM  
16 Minority Report, quote, "I am confident that  
17 there are other qualified commentators who  
18 would have pointed out the absurdity of  
19 differentiating macro and microevolution, a  
20 term that has no meaning outside of 01: 40PM  
21 creationists limits." Well, I don't know Mr.  
22 Hurd, but this statement is wildly false. The  
23 term micro and macroevolution were first used  
24 by neo-Darwinist Theodosia Dobzhansky in his  
25 1937 book, "Genetics and the Origin of 01: 40PM  
0166 Species". And I'll just quote a few sentences  
1 here. There is no way toward an understanding  
2 of the mechanism of macroevolutionary changes  
3 which require time on the geological scale,  
4 other than through a full comprehension of the 01: 40PM  
5 micro evolutionary process observable within  
6 the span of a human lifetime and often  
7 controlled by a man's will. For this reason we  
8 are compelled at the present level of  
9 knowledge, reluctantly, to put a sign of 01: 40PM  
10 equality between the mechanisms of macro and  
11 micro evolution and proceeding on this  
12 assumption to push our investigations as far as  
13 this working hypothesis will permit.  
14 Now, the terms macro and microevolution 01: 41PM  
15 are found throughout the evolutionary  
16 literature right up to present day. And what's  
17 interesting is that this problem that  
18 Dobzhansky pointed to is that we actually can't  
19 get a handle on the macroevolutionary process 01: 41PM  
20 without extrapolating from microevolution.  
21 This problem is still with us and it's highly  
22 controversial among biologists. I on my way  
23 down --on the way down here was finally getting  
24 a chance to read a book that came out in 2003, 01: 41PM  
0167  
1 it's called, "Origination of Organism of Form".  
2 Now, these are imminent evolutionary  
3 biologists. As far as I know there's not an ID  
4 proponent in there, certainly not a  
5 creationist. As far as I know all of them have 01: 41PM  
6 a faith that sooner or later completely natural  
7 explanations can be found for all this

8 phenomenon. But to a person these writers say  
9 quite clearly that there's a problem  
10 extrapolating microevolution and macro 01: 42PM  
11 evolution, a scientific problem. It's just  
12 undeniable throughout the scientific  
13 literature. Maybe I could comment briefly on  
14 one term that appears in that paragraph,  
15 irreducibly complex. 01: 42PM

16 Q. Yes.

17 A. Another reviewer, reviewer Theobald, wrote in  
18 his review of the Minority Report, quote, "The  
19 term irreducibly complex is not found in the  
20 scientific biological literature and the 01: 42PM  
21 concept is not used by real research  
22 biologists. Rather it is a term from the  
23 pseudoscientific procreation of intelligent  
24 design proponents." While this isn't quite as  
25 wildly false as was stated about micro and 01: 42PM

0168  
1 macroevolution, it is false nevertheless. As  
2 far as I know the first person to use the term  
3 irreducibly complex in the biological  
4 literature was Michael Katz of Case Western  
5 University and he used it to describe-- maybe I 01: 43PM  
6 can just read it briefly, natural systems that  
7 cannot be reduced to smaller precursors. And  
8 Katz regarded them and their existence as a  
9 serious problem for Darwinian evolution.

10 Now, Lehigh University biochemist Michael 01: 43PM  
11 Behe got quite notorious when he proposed  
12 Intelligent Design as an explanation for  
13 irreducible complexity. But the phenomenon of  
14 irreducible complexity is independent of that  
15 explanation and preexists in the biological 01: 43PM  
16 literature. It is not a term coined by  
17 Intelligent Design at the press.

18 Q. Is it fair to say that the argument that this  
19 system is irreducibly complex is essentially a  
20 challenge to neo-Darwinism or to the accuracy 01: 43PM  
21 of natural selection?

22 A. Absolutely. Darwin himself acknowledged that  
23 although he does not use the term irreducibly  
24 complex he wrote in the origin of species, if  
25 it could be demonstrated-- if it could be-- I 01: 44PM

0169  
1 went from all to nothing. Are we still here?  
2 If it could be demonstrated that any complex  
3 organ existed which couldn't possibly have been  
4 formed by numerous successive slight  
5 modifications, my theory would absolutely break 01: 44PM  
6 down. And he's talking in there about the same  
7 thing that Katz was talking about.

8 Q. Have there been a lot of scientific criticisms  
9 that irreducible-- the idea of irreducible  
10 complexity has been completely refuted, could 01: 44PM  
11 you comment on that?

12 A. I can comment briefly, but I just haven't been  
13 able to keep up with the voluminous literature  
14 on that subject. But there's a long and  
15 ongoing debate between Mike Behe, Scott Menick, 01: 45PM  
16 various other people on the one side and Ken  
17 Miller and various other people on the other  
18 side as to whether the specific feature is

19 irreducibly complex or not. And I think that's  
20 a legitimate controversy. Maybe it is and 01: 45PM  
21 maybe it isn't.

22 Q. It hasn't been resolved?

23 A. No, it hasn't been resolved. It's continuing.  
24 But that controversy is actually distinct, as I  
25 said, from the explanation Darwin provides to 01: 45PM

0170  
1 try to account for irreducible complexity once  
2 established as a theory.

3 Q. Is that information that would be the fact that  
4 there is that controversy over that issue--  
5 pretty deep controversy, is that something that 01: 45PM  
6 would help and kind of aid the students  
7 understanding of what you would call Darwinian  
8 evolution?

9 A. It would certainly aid in their understanding  
10 in the sense that they would know there's a 01: 45PM  
11 controversy over whether Darwinian mechanisms  
12 can account for irreducibly complex systems if  
13 such exist. There certainly is controversy  
14 over that.

15 Q. Doctor Wells, I want-- I believe you're 01: 46PM  
16 familiar with the Ohio curriculum that--

17 A. I have read it.

18 Q. -- has been adopted by the State of Ohio. If  
19 you could just briefly explain what that  
20 curriculum is, why it was developed, and what 01: 46PM  
21 parts of that curriculum support the proposed  
22 changes in the Minority Report that are  
23 reflected in benchmark three?

24 A. Well, I have read the Ohio curriculum. I don't  
25 claim to be an expert on it, but it's 01: 46PM

0171  
1 certainly, I think, a model for how evolution  
2 should be taught if the schools have the time  
3 to do it. This particular curriculum, I think,  
4 takes an estimated duration of four to six  
5 hours of class time. Which given the purported 01: 47PM  
6 importance of evolution theory in modern  
7 biology I think should be well worth it in a  
8 biology curriculum.

9 But the Ohio curriculum goes into quite  
10 some detail presenting the arguments and 01: 47PM  
11 evidence for and against various aspects of  
12 Darwin's theory. And it provides an appendix  
13 with an annotated bibliography, sample  
14 questions and answers, study guides. I mean,  
15 it's really a valuable resource and I am 01: 47PM  
16 recommending to the State of Kansas doing  
17 something like that.

18 Q. I believe there will be other witnesses that  
19 will testify about that and we'll, at a later  
20 point in time, introduce copies of the Ohio 01: 47PM  
21 curriculum. Doctor Wells does not have those  
22 with him, but Doctor Wells does have with him  
23 some written testimony that he will hand to the  
24 committee and the reporter and Mr.  
25 Irigonegaray. 01: 48PM

0172  
1 MR. IRIGONEGARAY: May I have that  
2 written report now, if he's going to rely on it  
3 for any purpose whatsoever, please?

4 MR. CALVERT: Beg your pardon, sir?  
5 MR. IRIGONEGARAY: I would like to 01: 48PM  
6 have his written report if he's going to rely  
7 on it or has relied on it for any purpose.  
8 MR. CALVERT: Well, we will provide  
9 that.  
10 MR. IRIGONEGARAY: If he has it, I 01: 48PM  
11 would like to have it so I can question him.  
12 THE WITNESS: It's up to you, John.  
13 MR. CALVERT: If we have it, sure.  
14 Q. (BY MR. CALVERT) Doctor Wells, in conclusion--  
15 MR. IRIGONEGARAY: Thank you very 01: 48PM  
16 much.  
17 THE WITNESS: Uh-huh.  
18 Q. (BY MR. CALVERT) In conclusion could you  
19 explain why you believe the State of Kansas  
20 should implement the proposed revisions in the 01: 48PM  
21 standard three, benchmark three of the high  
22 school science standards?  
23 A. Yes, very briefly. Although I have indicated  
24 my disagreement possibly with a word or two in  
25 the actual phrasing of things, I think it's a 01: 49PM  
0173  
1 valuable addition to standards because it  
2 alerts teachers and students to problems with  
3 evolution theory. Darwinian evolution theory  
4 is very real and currently very controversial  
5 within the biological community. And I think 01: 49PM  
6 it actually makes the whole study of evolution  
7 far more exciting when students know about  
8 that, rather than just having to memorize  
9 things by rote. Which is one reason why in the  
10 beginning I emphasized the process of science 01: 49PM  
11 rather than the learning of specific  
12 explanations.  
13 Q. Thank you very much.  
14 MR. CALVERT: I believe Doctor Wells  
15 is open for questions after he gets a drink of 01: 49PM  
16 water.  
17 CHAIRMAN ABRAMS: Hold it just a  
18 minute. Mr. Irigonegaray, you have 24 minutes.  
19 CROSS EXAMINATION  
20 BY MR. IRIGONEGARAY: 01: 51PM  
21 Q. I have a few questions for you, sir. You are  
22 the same Jonathan Wells as the individual that  
23 is the senior fellow at the Center for Renewal  
24 Science and Culture, the acronym CRSC?  
25 A. That was a former acronym. That was the 01: 51PM  
0174  
1 original name of the center. It's now the  
2 Center for Science and Culture, CSC.  
3 Q. Which was a branch of the Discovery Institute?  
4 A. It's one the programs of Discovery, yes.  
5 Q. Which is a private funded conservative think 01: 51PM  
6 tank based out of Seattle?  
7 A. It's a privately funded think tank. It  
8 actually includes a lot of people who would not  
9 consider themselves conservative.  
10 Q. It is true, is it not, that it believes that 01: 51PM  
11 Science, in general, and the theory of  
12 evolution, in particular, are responsible for  
13 materialistic, atheistic philosophy, whose  
14 destructive cultural consequences in our



15 society must be reversed? 01: 52PM  
16 A. I'm not sure where you're getting that  
17 statement.  
18 Q. Do you agree with that statement?  
19 A. No.  
20 Q. So you disavow that statement? 01: 52PM  
21 A. I do not think science is responsible for  
22 cultural materialism. I think a misuse of  
23 Science is responsible for it.  
24 Q. Is it your opinion that science today,  
25 particularly mainstream science represents that 01: 52PM  
0175  
1 which I have read?  
2 A. A large number of scientists today would  
3 subscribe to the sort of view that is being  
4 criticized there. That's a sociological  
5 statement, not a statement about science per 01: 52PM  
6 se.  
7 Q. Is it true that the CRSC--  
8 CSC.  
9 Q. CSC. Give me that acronym now, please?  
10 A. Center for Science and Culture, CSC. 01: 52PM  
11 Q. It's been changed to CSC. When was that change  
12 made?  
13 A. A couple of years ago. I'm sort of on the  
14 edges of it as a research fellow, so I'm not  
15 directly involved in their day-to-day 01: 53PM  
16 activities.  
17 Q. You were certainly involved with it when it was  
18 the CRSC?  
19 A. I was a senior fellow then, yes.  
20 Q. And it is true that as part of the former CRSC 01: 53PM  
21 strategy, now the CSC, the wedge was a strategy  
22 for replacing science as it is currently  
23 practiced with Intelligent Design, which is a  
24 theistic science which would allow supernatural  
25 causes. That is true, is it not? 01: 53PM  
0176  
1 A. True of what?  
2 Q. Of what the former CRSC, now the CSC has a goal  
3 through the wedge?  
4 A. I don't know. I don't know what document  
5 you're referring to. 01: 53PM  
6 Q. Are you familiar with the wedge?  
7 A. I have heard of it.  
8 Q. You have just heard of it?  
9 A. I read some version of it years ago. I haven't  
10 seen it since. But my own view and the view of 01: 54PM  
11 people I work with is not that science is the  
12 culprit here. Materialistic philosophy in the  
13 guise of science is the culprit.  
14 Q. And who do you allege are materialist  
15 philosophers? 01: 54PM  
16 A. Well, I could name some names. Daniel Bennett,  
17 for example.  
18 Q. Are you suggesting that the majority of  
19 scientists in the United States and the world  
20 that adhere to the theory of evolution may be 01: 54PM  
21 defined as such?  
22 A. I wouldn't know how to evaluate that. I  
23 certainly couldn't evaluate it outside the  
24 United States. I do know that several of the  
25 professional societies that I belong to in 01: 54PM

0177

1 biology do have statements like that as  
2 policies.  
3 Q. Is it your belief that mainstream science is  
4 biased against your views?  
5 A. If by mainstream you mean the majority of 01: 54PM  
6 currently practicing scientists and by bias  
7 against my views, I assume you mean my  
8 criticisms of evolution theory as in icons of  
9 evolution, the answer would be, yes, most of  
10 them disagree with me. I am definitely in the 01: 55PM  
11 minority, which is why I'm here supporting the  
12 Minority Report.  
13 Q. That's pretty obvious you are in the minority.  
14 A. I enjoy being in the minority. I'm more  
15 comfortable. 01: 55PM  
16 Q. More than being right?  
17 A. More than you? I missed that, I'm sorry. I  
18 prefer to be right. If that means I'm in the  
19 minority, so be it.  
20 Q. Now, sir, it is true, is it not, that the 01: 56PM  
21 former CRSC, now the CSC, has as its long-term  
22 agenda to extend Intelligent Design to all  
23 aspects of the culture, as their name  
24 indicates, to hope to renew science and culture  
25 in some sort of a mix? 01: 56PM

0178

1 A. I'd say that's true, yes. But the method by  
2 which that's intended is to have Intelligent  
3 Design win on the scientific grounds.  
4 Q. It is true--  
5 A. It's obviously a long way from having done that 01: 56PM  
6 at this point.  
7 Q. It is true, is it not, that as a member of the  
8 Discovery Institute you first joined in 1996?  
9 A. I became a senior-- well, the center was 01: 57PM  
10 founded in 1996, yes. I forget the exact date  
11 when I became a senior fellow. I moved to  
12 Seattle in 1998.  
13 Q. Is it true that as early as the 1970s you were  
14 a member of the Reverend Sun Myung Moon's  
15 Unification Church? 01: 57PM  
16 A. Yes.  
17 Q. And is it a fact that while involved with that  
18 church you became convinced that evolution was  
19 false because it reflected-- it conflicted with  
20 your church belief that humankind was 01: 57PM  
21 specifically designed by God?  
22 A. I became convinced that the Darwinian theory is  
23 false because it conflicts with the evidence.  
24 Q. You keep using the term Darwinian evolution.  
25 You would agree, would you not, that since 01: 57PM

0179

1 Darwin the science of evolution has advanced  
2 greatly?  
3 A. Well, then I would include in that  
4 neo-Darwinian evolution, which is just  
5 Darwinism combined-- 01: 58PM  
6 Q. You keep using Darwinism and neo-Darwinism,  
7 isn't it, in fact, the science of evolution  
8 that we should be speaking about and not using  
9 terms that are intended to simply draw a  
10 reaction if we're interested in speaking about 01: 58PM

11 science?  
12 A. I prefer to be precise. The problem is the  
13 term evolution, as several speakers before me  
14 pointed out, is vague. I mean, it can mean 01: 58PM  
15 change over time. I've seen it defined in  
16 textbooks as change in gene frequencies. Well,  
17 that's not correct. My children have different  
18 gene frequencies from mine and they haven't  
19 evolved.  
20 Q. Please answer my question, Doctor Wells. 01: 58PM  
21 A. I'm trying to be precise.  
22 Q. It is true that since Darwin 150 years ago the  
23 science of evolution has advanced greatly? As  
24 an example, Darwin had no knowledge about  
25 genetics, did he? 01: 58PM  
0180  
1 A. No, he didn't. That's why I said neo-Darwinism  
2 is Darwin's theory combined with modern  
3 genetics. Neo-Darwinism. So it's true I could  
4 say neo-Darwinian evolution, that would  
5 actually be more accurate in this situation. 01: 59PM  
6 So I'll say neo-Darwinism evolution.  
7 Q. Is that the manner in which you would broadly  
8 paint all scientists involved in evolution as  
9 neo-Darwinist?  
10 A. Absolutely not. I just saw in the book where 01: 59PM  
11 people say neo-Darwinism fails and they would  
12 call themselves evolutionary biologists in some  
13 general sense. So that is why I am  
14 specifically criticizing neo-Darwinian  
15 evolution, Darwinian evolution for shorthand. 01: 59PM  
16 Q. After you received your degree in biology you  
17 did immediately go to work for the Discovery  
18 institute, did you not?  
19 A. No, I didn't. I worked for several years as  
20 supervisor of a medical laboratory in 01: 59PM  
21 California.  
22 Q. Doing what?  
23 A. Supervising a medical laboratory.  
24 Q. Doing what?  
25 A. Well, not only laboratory tests-- actually I've 01: 59PM  
0181  
1 been a medical laboratory technologist for  
2 about 25 years. But as supervisor I had to  
3 schedule people, I had to supervise quality  
4 control, I had to maintain a computer system.  
5 So in addition to my duties, I had these 02: 00PM  
6 administrative duties as well.  
7 Q. Doctor Wells, do you have a personal opinion as  
8 to how old the earth is?  
9 A. I think the earth is probably four-and-a-half  
10 billion or so years old. But I'll tell you 02: 00PM  
11 this, I used to-- I would have said, a few  
12 years ago, I'm convinced it's four-and-a-half  
13 billion years old. But the truth is I have not  
14 looked at the evidence. And I have become 02: 00PM  
15 increasingly suspicious of the evidence that is  
16 presented to me and that's why at this point I  
17 would say probably it's four-and-a-half billion  
18 years old, but I haven't looked at the  
19 evidence.  
20 Q. You do accept, do you not, common descent 02: 01PM  
21 within species?

22 A. Within a single species, of course. I don't  
 23 know anyone who doesn't.  
 24 Q. What about among species?  
 25 A. Among species? Well, I stated in my power 02: 01PM  
 0182  
 1 point that I find it extremely unlikely based  
 2 on the evidence that the animal phyla are  
 3 related through common ancestry. Other  
 4 biologists have said they're dubious of common  
 5 ancestry at levels higher than that. The 02: 01PM  
 6 levels in between, I don't know. As a  
 7 scientist I would have to say each case would  
 8 have to be settled based on the evidence.  
 9 Q. What about between humans, the humans-- homo  
 10 sapiens and other species, such as prehominiids? 02: 01PM  
 11 A. I think it's extremely unlikely based on the  
 12 evidence.  
 13 Q. You would agree that that opinion is a rather  
 14 insignificant minority that believes that?  
 15 A. Well, I don't feel insignificant, but I've 02: 01PM  
 16 already conceded I'm with the minority, yes.  
 17 If someone could show me a mechanism whereby an  
 18 ape-like creature could turn into something  
 19 like a human, I would accept it. But I've  
 20 looked and I haven't found it, not even 02: 02PM  
 21 remotely close.  
 22 Q. It is important, is it not, to keep science  
 23 neutral as far as faith is concerned?  
 24 A. Well, faith is a loaded word. But I'll say,  
 25 yes, for the sake of argument. I find lots of 02: 02PM  
 0183  
 1 faith in science, actually. Faith in common  
 2 ancestry, for example.  
 3 Q. And the fact that someone-- the fact that  
 4 someone is involved in the study of the natural  
 5 process in the scientific process, that does 02: 03PM  
 6 not, in your mind, equate to that individual  
 7 not being able to maintain a religious faith  
 8 which is compatible with science and evolution,  
 9 is it?  
 10 A. I see no problem at all. In fact, the world's 02: 03PM  
 11 greatest scientists were very religious people,  
 12 including the world's greatest biologist.  
 13 Except for Darwin.  
 14 Q. To your understanding is there anything in the  
 15 standards that prevent teachers from discussion 02: 03PM  
 16 of these sort of issues and evidence and  
 17 controversies you have raised?  
 18 A. Certainly nothing positively discourages them.  
 19 What I find discouraging in the existing  
 20 standards is the tone of Darwin only. We're 02: 04PM  
 21 going to present Darwinian evolution as though  
 22 it were the explanation.  
 23 Q. Where in the standards does it say that only  
 24 Darwin theory is to be taught?  
 25 A. It doesn't have to be because it presents only 02: 04PM  
 0184  
 1 Darwin's theory. And I'm not actually  
 2 suggesting that it present other theories, I'm  
 3 not. I'm suggesting that the standards should  
 4 include at least knowledge of the fact that  
 5 there are problems between this explanation and 02: 04PM  
 6 the evidence.

7 Q. It is true, is it not, that a gentleman named  
8 Paul Nelson, together with Mr. Johnson and  
9 others, were instrumental in the early days of  
10 Intelligent Design? 02: 06PM  
11 A. Phillip Johnson, Paul Nelson.  
12 Q. Yes.  
13 A. Yes, they're still involved in it.  
14 Q. I'd like to read a quote to you from Mr. Paul  
15 Nelson. "Intelligent Design proponents offer 02: 06PM  
16 nothing to the scientific community upon which  
17 a scientific program can be developed. They  
18 don't even have clearly defined definitions of  
19 critical terms that can be understood and  
20 applied by others. For example, they have 02: 06PM  
21 provided no objective basis upon which others  
22 can apply concepts, such as irreducible  
23 complexity or specific complexity."  
24 A. Specified.  
25 Q. "They focus on critiques of evolutionary 02: 06PM  
0185 theories that either attack strong views of  
1 evolution, misrepresent current science, or are  
2 simply based on flawed reasoning. They also  
3 point to areas of frontier science in which the  
4 scientific community is yet to reach a 02: 07PM  
5 consensus. None of this constitutes any  
6 challenge to the predicted and explanatory  
7 power of evolutionary theory. In short, with  
8 regard to Intelligent Design there is nothing  
9 there. There simply is no theory of ID or 02: 07PM  
10 anything approaching it. ID is not used in  
11 scientific research, even by its primary  
12 proponents. All ID is is a series of failed  
13 and rejected criticisms of evolutionary theory.  
14 Easily the biggest challenge facing the ID 02: 08PM  
15 community is to develop a full fledged theory  
16 of biological design. We don't have such a  
17 theory right now and that's a real problem.  
18 Without a theory it is very hard to know where  
19 to direct your research focus. Right now we've 02: 08PM  
20 got a bag of powerful intuitions and a handful  
21 of notions such as irreducible complexity and  
22 specified complexity, but as yet no general  
23 theory of biological design."  
24 I'd like to ask you a couple of questions 02: 08PM  
0186  
1 about that quote. It is true, is it not, that  
2 there is no such thing as an ID theory?  
3 A. I wouldn't say that. By the way I don't think  
4 all that's from Paul Nelson.  
5 Q. It is true, is it not, that there is no ID 02: 08PM  
6 theory?  
7 A. I just said, no, I don't believe that.  
8 Q. You believe that there is a definable theory of  
9 Intelligent Design?  
10 A. Yes, I do. It's certainly in progress. I 02: 09PM  
11 would not advocate putting it in the curriculum  
12 for reasons other people have given here. It's  
13 a young theory. It hasn't proved itself, it  
14 doesn't deserve a place in the curriculum as a  
15 requirement. It's an exciting theory and I 02: 09PM  
16 think a robust one. And not all of that is  
17 from Paul Nelson.

18 Q. And would you agree that Intelligent Design  
19 must, in the end, conclude that a designer was  
20 involved? 02: 09PM  
21 A. A mind, yes. A designing mind. If something  
22 is actually designed, then a designing mind had  
23 to do it.  
24 Q. But you're not suggesting it was the design of  
25 man? 02: 09PM  
0187  
1 A. Designed by man?  
2 Q. Yes.  
3 A. Well, certainly before humans appear on the  
4 scene, no it couldn't be.  
5 Q. So the answer, which ID attempts to provide, is 02: 09PM  
6 a supernatural one, is it not?  
7 A. I won't go there. And here's why, I've said  
8 already I do not think science benefits from  
9 defining ahead of time sorts of explanations  
10 that it can find. There are already 02: 10PM  
11 scientists-- respected scientists in this  
12 country who do experiments on things that most  
13 people consider supernatural, such as prayer.  
14 When Newton proposed the theory of gravitation  
15 it was dismissed as supernaturalism because it 02: 10PM  
16 was action at a distance.  
17 What constitutes supernaturalism in  
18 today's science may very well not be  
19 supernatural in tomorrow's science. That's why  
20 I emphasize the process of testing hypotheses 02: 10PM  
21 against the evidence.  
22 Q. I understand, sir, but there is a difference  
23 between looking at nature and asking questions  
24 versus looking at questions and because we  
25 cannot find an answer at the moment assuming 02: 10PM  
0188  
1 that it had to be an intelligent designer?  
2 A. That's not how Intelligent Design works.  
3 Intelligent Design is not an argument for  
4 ignorance. What it does is it sets certain  
5 criteria by which we normally, in the course of 02: 11PM  
6 our daily lives, determine whether certain  
7 things are designed or not and then it argues  
8 that that can be extended to creatures of the  
9 natural world. Obviously that's a  
10 controversial claim, but I think it is a 02: 11PM  
11 legitimate one.  
12 MR. IRI GONEGARAY: I have nothing  
13 further.  
14 EXAMINATION  
15 BY MS. MORRIS: 02: 11PM  
16 Q. Thank you for coming, Doctor Wells.  
17 A. Thank you for inviting me. I love controversy.  
18 Q. Irreducibly complex, where did that term  
19 originate or where in the research did that  
20 start showing up? 02: 11PM  
21 A. As far as I know-- and I actually gave you a  
22 handout about it.  
23 Q. I noticed that and I can study it later if you  
24 feel like I'm going to get my answers there?  
25 A. It's just documented there. 02: 12PM  
0189  
1 Q. Okay.  
2 A. The citation is there. As far as I know the

first use of it was Michael Katz of Case Western University.

Q. Around what year? 02: 12PM

A. 1986. I'm sorry. 1986, which was ten years before Michael Behe's study.

Q. Now, this prebiotic soup that we discussed earlier, there was a speck that landed in the soup. What's the scientific term for that? Is it a cell? What is it that we just discovered or they were saying was irreducibly complex, what's the term? Was it a cell? 02: 12PM

A. Are you talking about origin of life researcher what they would say? 02: 12PM

Q. I don't even know. I'm just saying what was the first piece of life?

A. The first piece of life?

Q. According to Darwin, what was it called?

A. Well, Darwin was not clear on this. He didn't pretend to have the answer. He talked about a warm little pond, but he didn't really deal with it. 02: 13PM

One modern evolutionary biologist, Carl Woos, at the University of Illinois years ago 02: 13PM

thought that he could show that all the domains of life-- the major domains were related, but came to the conclusion just in the last few years that they were not, that they emerged separately from this primordial soup, or whatever you want to call it. And that the soup itself consisted of a mixture of complicated molecules that interacted like-- sort of like living things, but not quite like living things. And I'm trying to represent Woos' position. It's not my position, so I'm not sure I have it right. He would say something like that. 02: 13PM

Q. Okay. What has been discovered to be reducibly complex? 02: 14PM

A. Well, something reducibly complex would be anything that would continue to function after you take certain parts away from it. Irreducibly complex means that those parts are necessary for the functioning. If you remove any one of them then the thing you're talking about stops functioning. That's irreducible complexity. 02: 14PM

Q. Okay. I'm going to pass the mike for now and see if I can get my questions possessed. Thank you. 02: 14PM

#### EXAMINATION

BY CHAIRMAN ABRAMS:

Q. Doctor Wells, you state that neo-Darwinian evolution and biological evolution are not the same, how are they different? 02: 14PM

A. Well, they're often confused, as they have been here. But I know people who would call themselves evolutionists who distinctly disavow neo-Darwinism. So there has to be a larger class of evolutionists and some general sense that living things have changed over time by some mechanism which we don't yet know as 02: 14PM

14 opposed to neo-Darwinian evolutionists who  
 15 think that the change happened by neo-Darwinian 02: 15PM  
 16 mechanisms. So there's a distinction in the  
 17 scientific community.

18 Q. Okay. I understand the thought about  
 19 neo-Darwinian evolutionists. But if someone  
 20 calls themselves a biological evolutionist, 02: 15PM  
 21 what does that imply or how is that different?

22 A. Well, I think you'd have to ask each  
 23 individual. It might mean, for example, they  
 24 will be-- an interest in common ancestry, so  
 25 everything shares a common ancestry, but the 02: 15PM

0192  
 1 mechanism of change are something other than  
 2 what Darwin or neo-Darwinians proposes. But  
 3 you'd have to ask each individual what he means  
 4 or what she means.

5 Q. So why would you say that as has been stated 02: 15PM  
 6 before and you have stated also that the word  
 7 evolution is a rather slippery word? Why is  
 8 that? Why don't we be distinct and be  
 9 specific?

10 A. I try to be. I really do try to be. 02: 16PM

11 Q. In the science field, I mean, it is not  
 12 generally considered to be distinct and  
 13 specific?

14 A. Well, often it's a throwaway word. I mean.  
 15 It's just a word you put out there, you know, 02: 16PM  
 16 it's just part of the jargon. If you're  
 17 dealing with a specific aspect of it in a  
 18 scientific writing, then usually you define  
 19 that aspect and zero in on what that is. Very  
 20 few biologists would say I am not an 02: 16PM  
 21 evolutionist. I mean, in a sense-- in a  
 22 general sense I'm an evolutionist, but I'm  
 23 definitely not a Darwinian or a neo-Darwinian  
 24 evolutionist.

25 Q. What would you say-- or can you state what the 02: 16PM

0193  
 1 hypothesis of the theory of neo-Darwinian  
 2 evolution is?

3 A. Yes, I'll do my best. First of all, Darwin's  
 4 theory-- and this is an extension of that,  
 5 Darwin's theory is that distinct with 02: 17PM  
 6 modification. All living things share a common  
 7 ancestry and they have become modified through  
 8 natural selection acting on random variations.  
 9 Now, the only addition in neo-Darwinism is that  
 10 the variations are explained by recourse 02: 17PM  
 11 through genetic mutations, genetic differences.  
 12 So it's natural selection acting on genetic  
 13 variations causes things to evolve from a  
 14 common ancestor. That would be it in a  
 15 nutshell. 02: 17PM

16 Q. As I understand it when Albert Einstein was  
 17 first trying to bring out his theory of  
 18 relativity he made a prediction that light  
 19 would actually bend and that was unknown at the  
 20 time and it was-- he made this prediction, 02: 17PM  
 21 stepped out there, and made it and in a few  
 22 years certainly found that it was, that light  
 23 can bend. Therefore, he stepped out and that  
 24 was an act of falsification, he was able to



25 state this hypothesis. 02: 18PM

0194

1 A. He took a risk.

2 Q. And he stated a prediction and it either proved  
3 it false or it substantiated it. And it's  
4 substantiated it at that point in time. It was  
5 not proven false. So with that in mind the 02: 18PM  
6 prediction that with the hypothesis of  
7 neo-Darwinian evolution that there is common  
8 ancestry, why doesn't the analysis, the  
9 evidence that-- about the 18sRNA tree versus  
10 the 28sRNA tree falsify that, why doesn't that 02: 18PM  
11 do that?

12 A. In my opinion because neo-Darwinian evolution  
13 has left the realm of science. It now  
14 functions as an assumption, an underlying  
15 given, a dogma. It cannot be falsified. 02: 19PM  
16 Nothing can falsify it because it's a given.  
17 It does make predictions. I would argue that  
18 virtually every prediction it has made above  
19 the species level has been falsified in the  
20 sense you just described and yet the theory is 02: 19PM  
21 still with us. And I would argue that that is  
22 evidence for nonscientific nature.

23 Now, why should it be taught in science  
24 class, because sociologically it is still part  
25 of science. I just think it should be taught 02: 19PM

0195

1 fully.

2 CHAIRMAN ABRAMS: Thank you very  
3 much. Any other questions?

4 EXAMINATION

5 BY MS. MARTIN: 02: 19PM

6 Q. Thank you for telling us a little bit more  
7 about Intelligent Design. We have a lot of  
8 people addressing us and saying, well, this is  
9 not science and why and when I say, well, I  
10 think it has a scientific basis they still 02: 20PM  
11 argue that it's not science. Can you address  
12 any of that why is Intelligent Design science  
13 and--

14 A. Well, it's interesting. If you read the  
15 evolutionary literature, at least before the 02: 20PM  
16 last few years when this started brewing more  
17 heated, Darwinian evolutionists have  
18 consistently argued against Design. Darwin  
19 himself did. Hundreds of pages in the origin  
20 of species included the argument against 02: 20PM  
21 design. The argument was that the evidence  
22 will show that what looks like it's designed  
23 can actually be explained by natural processes.

24 Now, if evidence can show that something  
25 is not designed, then in principle evidence can 02: 20PM

0196

1 show something is designed. You can't have it  
2 both ways. You can't say suddenly-- well, you  
3 can't argue for design because all of a sudden  
4 that involves something supernatural. Darwin  
5 was excluding the supernatural and claiming 02: 20PM  
6 that the evidence justified it.

7 I would say if you're going to resort to  
8 evidence on one side, you can resort to it on  
9 the other. And for me that's all Intelligent

10 Design does, says the evidence we see points to 02: 21PM  
11 design. Where we go beyond that is a  
12 theological question. I'm also a theologian so  
13 I know those questions, but that's not science.

14 Q. We appreciate you being here. It's been  
15 fascinating to hear some of your comments and 02: 21PM  
16 remarks.

EXAMINATION

17 BY MS. MORRIS:

18 Q. I just have a brief question.

19 A. Oh, I'm sorry. 02: 21PM

20 Q. That's okay. You had a reference to Darwin, I  
21 believe it's one of his books and it went on  
22 concluded by summary, would absolutely  
23 breakdown. Is the reference to that quote in  
24 the material you gave us? 02: 21PM  
25

0197

1 A. It is. It's in the supplement K on irreducible  
2 complexity and it's from The Origin of Species.

3 Q. Okay.

4 A. Chapter 6.

5 Q. Okay. What was it that he said was 02: 21PM  
6 irreducibly-- he didn't say irreducibly  
7 complex, but what was he talking about if that  
8 ever broke down or if that ever was termed to  
9 be irreducibly complex then his theory would  
10 break down, that's my paraphrasing, what was 02: 22PM  
11 that thing he was talking about?

12 A. If anything could be shown to be like this, you  
13 mean?

14 Q. Yes.

15 A. Anything at all. The eye, the hand, the human 02: 22PM  
16 person, a leaf. Any feature-- he was speaking  
17 specifically of the biological world, but any  
18 feature that could be shown not to have been  
19 formed by numerous life succession  
20 modifications then his theory would absolutely 02: 22PM  
21 breakdown. It could be anything.

22 What's interesting is all it takes is  
23 one, one example and Darwin's theory is  
24 finished according to Darwin himself. And  
25 Intelligent Design theory, you might know, does 02: 22PM

0198

1 not need to see everything as design. We  
2 follow the evidence where it goes. If it's  
3 design, fine. If it's not, that's what the  
4 evidence shows.

5 UNIDENTIFIED SPEAKER: And that's 02: 23PM  
6 time.

7 MS. MARTIN: Thank you.

8 CHAIRMAN ABRAMS: Thank you, Doctor  
9 Wells. Mr. Calvert.

10 MR. CALVERT: Doctor Abrams, looks 02: 23PM  
11 like we go ahead and start with Doctor Simat.  
12 We might be able to not have to stay beyond  
13 5:30. So if it's okay with you I'd like to go  
14 ahead and call Doctor Simat.

15 CHAIRMAN ABRAMS: If we could bring 02: 25PM  
16 order back, please. If you'd take a seat.  
17 Please, take a seat. Mr. Calvert.

18 MR. CALVERT: Yes.

19

20 BRUCE SIMAT, Phd,  
Page 82

called as a witness on behalf of the Minority  
and testified as follows:

DIRECT EXAMINATION

BY MR. CALVERT:

Q. Doctor Abrams, members of the committee, I'd like to introduce you to Doctor Bruce Simat. And, Doctor Simat, I want to welcome you and thank you for traveling all the way from the fair state of Minnesota-- Wisconsin, I guess it is. 02: 26PM

A. No, don't go there.

Q. Minnesota. Would you further introduce yourself and give us a bit of information about your background? 02: 26PM

A. First of all, I'm not a cheese head. My name is Bruce Michael Simat. I'm currently at Northwestern College in St. Paul, Minnesota. My background starts with the University of Minnesota, Duluth, where I gained my bachelor's degree in biology and chemistry. I then went to the Duluth Medical School and got my master's degree in human physiology with biochemistry. After I did a research project there then I moved on to the University of Minnesota, Minneapolis and did my Ph.D. work in the Department of Medicine and the Department of Physiology in human physiology and biochemistry-- and biochemistry as a minor, but almost a second major. My thesis research was 02: 27PM

delving into the nuclear site of action of thyroid hormone and how it turned on specifically messenger RNA and the genome itself. After the University of Minnesota, I went to work for the U.S. Government at the VA Medical Center in a postdoctoral position looking at toxicology and specifically looking at how to modify specific therapeutic drugs that could be used as cardiotonics to reduce arrhythmias as well as to reduce bronchial congestion for asthmatics. 02: 28PM

In that experience I learned how specific biomolecules really work in the human body in a therapeutic fashion and how the slightest modification changed either their therapeutic value or it enhanced and made the drug extremely lethal. We were able to take some of those drugs and make them therapeutic at doses 1 X and lethal at does 2 X. You want to be very careful with cardiotonics. 02: 28PM

After that two-year experience I moved to Abbott Laboratories in Chicago, Illinois, and worked for four years with them in their medical diagnostic division. There I invented new biomolecules for that division. 02: 29PM

Biomolecules that were used to produce blood tests in the hospital market. After that I went to--

Q. What were you testing for in your blood tests?

A. Oh, things that you might not like. Pregnancy 02: 29PM

6 tests and human thyroid hormone, prolactin  
7 hormone. And we had a very successful unit.  
8 In fact, I also headed up a group that was a  
9 new technology group looking to produce some of  
10 these tests in the home market so that they 02: 29PM  
11 could be a home pregnancy test, for instance.  
12 And we worked very carefully with new  
13 techniques in delivery where you could do mass  
14 amounts of protein attached to small plastic  
15 particles. So I learned a lot about material 02: 30PM  
16 science there as well.  
17 And that is why I was hired through head  
18 hunters to come to Minnesota to look at a job  
19 that was produced by Sanofi Diagnostic Pasteur,  
20 which is French company in Minneapolis. And 02: 30PM  
21 there we worked on diagnostic tests, but more  
22 importantly I think is the experience I had  
23 with the new technologies. I learned very  
24 carefully how to produce blood tests with a new  
25 technology. In fact, three new technologies. 02: 30PM  
0202  
1 I actually won a science award for technology  
2 in putting the biomolecules on them.  
3 Since that time-- and that-- I guess that  
4 was eleven years ago when I quit that job.  
5 Since that time I have worked for Northwestern 02: 31PM  
6 College in Minnesota. And for the last eleven  
7 years I've been teaching a variety of classes  
8 there.  
9 Q. Why did you take the job at Northwestern? What  
10 did they ask you to do? 02: 31PM  
11 A. Well, actually I had a choice of going into  
12 technology again, biotechnology. There's  
13 plenty of companies in the twin cities where  
14 you can do biotechnology, but I-- I don't know  
15 if I can explain it easily. I really had a yen 02: 31PM  
16 to try teaching because I had not really been a  
17 professor in a college before, although I had  
18 taught extensively through the businesses. So  
19 I was hired because of my extensive background  
20 in teaching in business and teaching bio and 02: 31PM  
21 biotechnology.  
22 They had a two-year associate degree in  
23 science and it had just been approved by the  
24 State of Minnesota to be upgraded to a  
25 four-year bachelor's degree. So they had no 02: 32PM  
0203  
1 one to teach the third and fourth year classes.  
2 In fact, there were no third and fourth year  
3 classes. So my job was to invent them. And,  
4 in fact, doing curriculum development for all  
5 upper division classes. That's quite a 02: 32PM  
6 challenge.  
7 Most people go to the university system  
8 or any kind of college system and take over a  
9 position, not invent two years of classes. So  
10 I had a unique experience under my belt here 02: 32PM  
11 for eleven years of developing classes for  
12 developmental biology, immunology, animal  
13 biology, physiology, biochemistry, principles  
14 of biology, concept of biology. I think  
15 there's more. 02: 33PM  
16 Q. Did you run into evolutionary theory in

17 developing the curriculum for these programs?  
18 A. Everywhere. In my first year of teaching  
19 there-- this being a Christian college I sort  
20 to wondered whether or not I would be at odds 02: 33PM  
21 teaching at a Christian college and teaching  
22 evolution theory. What I found was that the  
23 students did a very good job of provoking me.  
24 And I use that word provoke in to knowing the  
25 evolutionary science very well. And I did not 02: 33PM  
0204  
1 know it that well in my first year. And I  
2 realized-- a very sharp example to me here was  
3 that I realized that all of my undergraduate  
4 biology, all of my master degrees biology, and  
5 all my doctoral biology had only been very 02: 33PM  
6 superficial in how it presented evolution. I  
7 knew all the standard jargon, I knew all the  
8 standard theories, I knew all the standard  
9 propositions, but when I was teaching in the  
10 textbooks what I did not know is how it 02: 34PM  
11 actually operated. I had never been really  
12 taught how it actually operated.  
13 Q. Did you use evolutionary theory in your  
14 operational science when you were working for  
15 Abbott labs and a couple of these other places? 02: 34PM  
16 A. I would say probably not at all, not at all.  
17 In fact, I realized in over those 15 years of  
18 research and development that I didn't run into  
19 anyone who ever mentioned evolution. It was  
20 not a topic of conversation over lunch, over 02: 34PM  
21 anything. It has no meaning. In operational  
22 science out there, it really has no meaning.  
23 Q. The argument has been made that in Kansas the  
24 Minority Report would somehow be embraced by  
25 mistake that would drive bioscience out of the 02: 35PM  
0205  
1 state, probably along with many other economic  
2 resources, could you comment on that?  
3 A. That's interesting. I don't know how that  
4 could be possible. Not only have I never run  
5 into evolution in the variety of companies, I 02: 35PM  
6 seldom run into it at all. With any of my  
7 colleagues in the University of Minnesota,  
8 which I have several friends working there  
9 still, it seems to come up as a topic of  
10 conversation only if someone is actually 02: 35PM  
11 teaching evolutionary science. Other than  
12 that, it does not seem to come up in anyone's  
13 research per se.  
14 In fact, I've been told by colleagues  
15 that if it wasn't for the-- this is their 02: 35PM  
16 words, if it wasn't for the fact that it was  
17 required of them in their conclusions to make  
18 evolutionary claims, they would not put in it  
19 their papers at all. And what I found is  
20 that's probably fairly true with most 02: 36PM  
21 researchers who are in the many disciplines who  
22 are looking at very narrow investigative areas.  
23 As a biochemist I was-- I was so deep  
24 into very narrow areas of how biomolecules work  
25 and how to modify them and how to make them 02: 36PM  
0206  
1 profitable, in fact, that there is no reason to

2 vary outside of that.

3 In fact, I read an article on a web site  
4 recently that was complaining, if you will,  
5 about the biochemist coming here to testify. 02: 36PM

6 And the individual said that, oh, that's okay,  
7 he's a biochemist, they usually don't know much  
8 about evolution. And I twinged at that a bit  
9 and I realized that that was absolutely true.

10 Except that now after eleven years my students 02: 37PM  
11 have forced me to learn about evolution.

12 So they have provoked me. The students  
13 provoke me to know everything about evolution  
14 because they came up with so many questions.

15 The textbooks were very dogmatic in their 02: 37PM  
16 approach to evolution, especially macro  
17 evolution and origins. No one had any trouble  
18 in my class talking about microevolution and  
19 diversity. No questions come from that. Every

20 one is just amazed how well that works 02: 37PM  
21 together. But every one has questions about

22 how macroevolution can work. I found eleven  
23 years ago that I couldn't answer that. Now,  
24 eleven years later, I still can't answer that  
25 and I read everything. I have the opportunity 02: 37PM

0207  
1 in my position of not having research required  
2 of me so I dabble in research with students for  
3 their own specific research purposes because  
4 it's very important that they have specific  
5 research projects that they can show-- we have 02: 37PM  
6 colloquium that are available to them at the  
7 University of Minnesota, our own school and at  
8 various other schools that they can show they  
9 have actually done specific personal research  
10 projects. 02: 38PM

11 So, yes, we work with research, but I do  
12 not have to have grants, I do not have to have  
13 a publish or perish attitude. That is not put  
14 upon me by my institution. That has allowed me  
15 to dabble in the fine art of reading everything 02: 38PM  
16 that I can and that has helped me so much to  
17 understand exactly what evolution says and  
18 evolution cannot say by the data.

19 Q. Doctor Simat, we were talking about this and  
20 you explained to me how you began to develop 02: 38PM  
21 curriculum and I think you said you first went  
22 through the textbooks and you would study the  
23 materials in a section dealing with micro  
24 evolution and then you would move to other  
25 chapters further on in the book. Can you talk 02: 38PM

0208  
1 a bit about that?

2 A. Some of the provocation coming from the  
3 students came from the wording in the  
4 textbooks. In the chapters, for instance, in  
5 genetics, when I teach that course the wording, 02: 39PM  
6 the verbs, if you will, used in describing  
7 mutations is very precise and very accurate and  
8 very declarative. They, with data, are able to  
9 declare that the mutations are deleterious,  
10 that there are insertions, deletions, et cetera 02: 39PM  
11 and that they cause problems with the function  
12 of that gene.

13 And then when we get to the chapter on  
14 macroevolution the question is asked-- and this  
15 is pages later, chapters later. The question 02: 39PM  
16 is asked can macroevolution lead to new forms  
17 of life. And the answer in one word was  
18 certainly. And then all of a sudden the verbs  
19 change to what I call soft verbs. No longer is  
20 it we know, we have tested, data shows. It is 02: 40PM  
21 now should have, could have, must have been.  
22 And my students picked up on that and wondered  
23 why all of a sudden there aren't declarative  
24 verbs here and everything is very soft in it's  
25 wording. That was provoking me, I had to find 02: 40PM  
0209  
1 out why. So I've been reading extensively and  
2 the textbooks are written accurately. It is a  
3 lot of soft verbs. There has to be because  
4 there's a lot of stories of how it possibly  
5 could have happened, but there is no data to 02: 40PM  
6 back it up such that we can say we have tested  
7 or we have produced such phenomenon.  
8 Q. Is it fair to say that what caused you to begin  
9 to challenge evolutionary theory was your  
10 asking-- your being asked to develop a new 02: 41PM  
11 curriculum?  
12 A. Yes. If it had not been finding these chapters  
13 in these textbooks I probably wouldn't have  
14 been involved with evolution at all. In fact,  
15 some of my textbooks don't mention evolution 02: 41PM  
16 but maybe in passing. My physiology textbook  
17 is pretty much devoid of using the term  
18 evolution. My biochemistry textbooks are  
19 scant. In fact, I go to the index to find  
20 every word that's mentioned so I can read 02: 41PM  
21 exactly what is being said there. And the  
22 entries to the index in the biochemistry  
23 textbook is about three or four entries, five  
24 entries maybe in the entire textbook. When it  
25 comes to genetics then there's a whole column 02: 42PM  
0210  
1 of entries in the index, so it's referred to  
2 often and talked about and described often.  
3 So with developmental biology, for  
4 instance, there is fair amount-- a lot of  
5 evolution mentioned there. So I am challenged 02: 42PM  
6 in certain classes and in other classes it's  
7 hardly mentioned.  
8 Q. We asked you to look at the proposals in the  
9 Minority Report and in particular the evolution  
10 benchmark, that's benchmark three, grades 8 02: 42PM  
11 through 12. And I'd like to direct your  
12 attention to that benchmark, that hopefully  
13 will come up on the screen here in a minute.  
14 And let's begin with the beginning of that  
15 benchmark, indicator 1 A adds additional 02: 43PM  
16 descriptive information about evolution.  
17 By the way, I notice on the left side of  
18 the column it says biological evolution,  
19 descent with modification is a scientific  
20 explanation for the history of the 02: 43PM  
21 diversification of organisms. What is the role  
22 of history in biological evolution and how does  
23 that affect the explanation?

24 A. That's rather interesting. The word history  
25 used in biology is a best guess at best. It 02: 43PM  
0211  
1 tends to be used only if we are trying to  
2 determine how a function came about today.  
3 When we do, for instance, history of disease,  
4 if we do something in physiology with that  
5 regard, we will look back and use history to 02: 44PM  
6 help us understand it in today's world.  
7 What I'm finding with the evolution  
8 claim, however, is that the macroevolution  
9 history-- if we look back at that origin's  
10 history has little to bear on science today in 02: 44PM  
11 terms of its actually practical use and what  
12 we're actually doing with it. And I'm  
13 realizing that that's probably why it's not  
14 being actually talked about out there in the  
15 marketplace of ideas. In the companies, in the 02: 44PM  
16 universities it's not being used on a  
17 day-to-day basis in their research for most--  
18 the vast majority of disciplines. The history  
19 is just that, it's a story that we have to make  
20 up because we don't know. It's not that we 02: 44PM  
21 have a historical record to look at so easily,  
22 especially with origins. What we have is our  
23 best guess, which means it's out of us.  
24 Q. Would you comment on indicator additional  
25 specificity 1 A, particularly the first 02: 45PM  
0212  
1 sentence, "Biological evolution postulates an  
2 unpredictable and unguided natural process that  
3 has no discernible direction or goal." Is that  
4 a scientifically accurate description of  
5 biological evolution? 02: 45PM  
6 A. Yes, it is. That is exactly what it says in  
7 the textbook.  
8 Q. The second sentence also, "It also assumes that  
9 life arose from an unguided natural process."  
10 Is that-- 02: 45PM  
11 A. That's also in the textbooks, yes. Exactly  
12 that. That is not anything different than what  
13 I've been reading and teaching for the last  
14 decade.  
15 Q. Is that information important to a student's 02: 45PM  
16 understanding of biological evolution?  
17 A. Well, absolutely. I think the definition of  
18 evolution cannot be minced or reduced. If  
19 that's what, in fact, the papers are publishing  
20 about, then that's what the textbooks have to 02: 46PM  
21 reflect. And, in fact, they do. So if you're  
22 not teaching that exactly as it's-- as it's  
23 being proclaimed, well, then you're not  
24 teaching evolution. So, yes, I think you need  
25 to-- every one needs to understand exactly what 02: 46PM  
0213  
1 evolution basis is.  
2 And I think-- and I think perhaps in my  
3 own experience I've had to meet that challenge  
4 also in that again coming out of a Christian  
5 college I have sort of, you know, wondered what 02: 46PM  
6 kind of trouble do I run into if I want to  
7 minimize-- if I feel I should be minimizing  
8 something, evolutionary theory, for instance,



9 and will there be pressures put on me. And I  
10 was very concerned about that. What was very 02: 46PM  
11 refreshing for me is that my college has  
12 virtually had no restraints on me in teaching  
13 biology. That's very refreshing. So I've been  
14 very open to talk about exactly what's in the  
15 textbook and-- but because of the students and 02: 47PM  
16 the way they're provoking me I have to know my  
17 evolutionary science very well. And I've come  
18 up short on origins and I've come up short on  
19 methodological naturalism to get into macro  
20 evolution. 02: 47PM  
21 Q. What is methodological naturalism?  
22 A. Well, sort of-- it's-- besides hard to say,  
23 it's actually quite straight forward in that  
24 nature has a method, so-- which is a little bit  
25 in conflict with-- if you will, with the 02: 47PM  
0214  
1 wording of unguided process. So nature has a  
2 method, but it's an unguided process. So the  
3 word method and unguided have a tension there.  
4 So if you have an unguided process then that's  
5 your method. So it's saying that the nature, 02: 48PM  
6 which has no discerning direction to it, will  
7 make a change in a gene sequence and change, in  
8 fact, one nucleotide. So, therefore, it's  
9 unguided. So that is the method that it is  
10 unguided. So that one change in that 02: 48PM  
11 nucleotide will make that DNA produce a protein  
12 that is different. So that's the method of  
13 nature according to that. Whether or not that  
14 can work or not is the question.  
15 Q. Does methodological naturalism essentially 02: 48PM  
16 limit explanation to an unguided process?  
17 A. I think it has to. Methodological naturalism  
18 then, by virtue of its name, states that nature  
19 is doing this. So that, in fact, it not only  
20 is unguided, it has to be unguided because we 02: 49PM  
21 cannot find-- we cannot find an intelligent  
22 molecule, we cannot find an intelligent force  
23 that would connect these nucleotides up to  
24 teach other. There's nothing in any of the  
25 literature and there's nothing we've ever found 02: 49PM  
0215  
1 that says a particular nucleotide would want to  
2 bind to any other particular nucleotide for the  
3 purpose of making a proper sequence that would  
4 be the proper sequence to make the proper  
5 protein. We don't have any forces that would 02: 49PM  
6 know how to do that.  
7 Q. Let me ask you this, going back to the first  
8 sentence in 1 A it says, "Biological evolution  
9 postulates an unpredictable and unguided  
10 natural process." Now, that is stated in the 02: 49PM  
11 nature of a theory or a postulate and that  
12 being the case doing science, we should be able  
13 to challenge that postulate-- that change  
14 results from an unguided process. Is that  
15 correct? I mean, science should-- we should be 02: 50PM  
16 able to challenge that?  
17 A. Yeah, all things should be available for  
18 challenging. That has been part of my anger  
19 with science is that nothing is sacred is the

20 norm for all other disciplines except evolution 02: 50PM  
21 and all of a sudden it becomes the sacred cow.

22 I have had an occasional outburst in  
23 class by me when I'm lecturing when I have to  
24 tell students that by golly when I did my  
25 master's research thesis research and when I 02: 50PM

0216  
1 did my post doctoral research and when I did 15  
2 years in companies with their research,  
3 everything-- everything is held up to scrutiny  
4 and skeptical analysis. Nothing is left  
5 untouched, nothing is taken for granted, 02: 51PM  
6 nothing is taken on faith, everything must be  
7 proven. And you can make theories about what's  
8 unproven, but then you call them theories. And  
9 if they get proven and enough people can

10 corroborate that, then you might be talking 02: 51PM  
11 something other than a theory or better than a  
12 theory. But when you have open ended questions  
13 and you have nice stories about how that might  
14 happen, then you still don't call that theory,  
15 even though they're in a theory. Nobody else 02: 51PM  
16 gets away with that. Peer review editors don't  
17 let you get away with that. In your conclusion  
18 you say and I speculate, you don't say this is  
19 the truth because I made this story up, but not  
20 in evolution. 02: 51PM

21 Q. Let me ask you this, does methodological  
22 naturalism permit one to challenge that  
23 postulate that the process is unguided?

24 A. Well, that's why I get angry in class because  
25 it doesn't allow that. I want to challenge it, 02: 51PM

0217  
1 but my textbook says I cannot. So I have to go  
2 outside the textbook, so I find other papers  
3 that have-- that are, in fact, challenging  
4 that. I have found many papers that challenge  
5 the going norm that it is not challengeable. I 02: 52PM  
6 found many papers. In fact, I have put  
7 together several talks in the twin cities just  
8 about that, pointing out what other people are  
9 saying about the data and how, in fact, it  
10 doesn't support gradualism or that it doesn't 02: 52PM  
11 support abiogenic to biogenic in the soup. Or that  
12 the fossil record with it's Cambrian Explosion  
13 is not supporting a gradualistic Darwinian or  
14 neo-Darwinian concept.

15 One has to come up with a very fast 02: 52PM  
16 mutation rate that is still good and we don't  
17 have any information that you could have a fast  
18 mutation rate and still be reasonable and not  
19 kill things. In fact, we don't have data to  
20 show that slow mutation rates give you 02: 53PM  
21 something positive that you could actually  
22 develop with. And I have a lot on that as  
23 well.

24 Q. Doctor Simat, I'd like to direct your attention  
25 to indicator-- we're running out of time, so 02: 53PM

0218  
1 I'm going to go directly to indicator 6 C. And  
2 it relates to a statement that biological  
3 evolution is used as broad unifying theory or  
4 framework for biology and that natural

5 selection of genetic drift, genomes, and the 02: 53PM  
6 mechanisms of genetic change provide a context  
7 in which to ask research questions and help  
8 explain observed change in the populations.  
9 And then Doctor Harris and his colleagues have  
10 added, quote, "However, reverse engineering and 02: 54PM  
11 undirected thinking are used to understand the  
12 function of biosystems and information." My  
13 question is, is that-- is that a valid and  
14 accurate statement is-- are biochemists and  
15 people in operational science using that kind 02: 54PM  
16 of thinking and is that really inconsistent  
17 with the methodological naturalist?  
18 UNIDENTIFIED SPEAKER: Two minutes.  
19 A. Well, we have a-- we had a piece of paper.  
20 We'll wing it. All right. Just recently-- 02: 54PM  
21 just recently I was reading a very nice piece  
22 on evolution of the immune system and-- among  
23 other systems and the blood system. And they  
24 do some very nice science here in terms of  
25 making a very science-type of story. I want to 02: 55PM  
0219  
1 call it scientific, but it is reverse  
2 engineering. We look at-- to fill the gap of  
3 how something very complex could have come from  
4 nothing then we look at what we have and we  
5 look at what it would take to start with and 02: 55PM  
6 then you just work backwards. So if something  
7 is more complex now you make it a little less  
8 complex, a little less, a little less, a little  
9 less until you come back to rudimentary  
10 molecules and talk about how all those got 02: 55PM  
11 together and ended up with this very complex  
12 process. It's a very interesting story, but it  
13 is in fact a historical story, not one of data.  
14 It is something that we would say would have  
15 had to have happened in time over-- and then, 02: 55PM  
16 of course, whatever period of time for that to  
17 have occurred.  
18 That is fraught with problems because  
19 this-- first of all, there's no data for that.  
20 Second of all, the story does not relate to the 02: 55PM  
21 entire process of the organism. As a  
22 biochemist I realize that that are so many  
23 patterns and so many lines of biochemistry and  
24 they all interrelate.  
25 UNIDENTIFIED SPEAKER: That's time. 02: 56PM  
0220  
1 A. And they all interrelate and, in fact, depend  
2 on each other. So to talk about how just one  
3 gets through the system and it doesn't affect  
4 the rest of them is very naive.  
5 Q. (BY MR. CALVERT) One final question. Do you 02: 56PM  
6 believe that changes in three are appropriate--  
7 benchmark three are appropriate?  
8 A. Benchmark?  
9 Q. The benchmark we've been talking about.  
10 Standard three, benchmark three. And this 02: 56PM  
11 deals with the changes in the Minority Report  
12 offered with respect to the section on  
13 biological evolution. Do you have any general  
14 comment on those changes, are they appropriate,  
15 inappropriate? 02: 56PM

16 A. Well, I think they're very appropriate in this  
 17 regard. My students coming out of a Christian  
 18 college are now armed with all of evolution.  
 19 Exactly what it teaches and exactly what it's  
 20 downfalls are or its shortcomings. They know 02: 57PM  
 21 what it can show and they know what it can't  
 22 show. I would say that they're probably better  
 23 armed than their counterparts who are going to  
 24 the University of Minnesota who are not shown  
 25 what, in fact, it can show or cannot show. So 02: 57PM  
 0221  
 1 who has more knowledge and who has more  
 2 accurate knowledge, those who know what a  
 3 theory can do and what it can't or those who  
 4 are just told the party line.  
 5 Q. Thank you so much for your testimony. 02: 57PM  
 6 MR. CALVERT: Mr. Irigonegaray, you  
 7 can commence your questions.  
 8 CHAIRMAN ABRAMS: Mr. Irigonegaray,  
 9 you have 16 minutes.  
 10 MR. IRIGONEGARAY: Thank you. 02: 57PM  
 11 CROSS EXAMINATION  
 12 BY MR. IRIGONEGARAY:  
 13 Q. Sir, the first question I'd like to ask you is,  
 14 do you accept the evolutionary theory of common  
 15 descent of humans from prehominiids? 02: 58PM  
 16 A. From the data that I've been following it's  
 17 probably not true.  
 18 Q. I'd like to now specifically address the issues  
 19 in the standards that you have discussed. Is  
 20 there anywhere that you have even been able to 02: 58PM  
 21 find in the standards an indication to teachers  
 22 and their students that they are not allowed to  
 23 discuss evolution in every aspect, including  
 24 whatever shortcomings may be involved in  
 25 evolution today? 02: 58PM  
 0222  
 1 A. I believe that the standard is setting up this  
 2 state to fail at biology.  
 3 Q. That wasn't my question.  
 4 A. I know it wasn't.  
 5 Q. Then please answer the question. Is there 02: 59PM  
 6 anything in the standards that would preclude a  
 7 teacher and his or her students from discussing  
 8 fully evolution, including whatever short  
 9 comings that students may question?  
 10 A. I don't believe that the standard, as it's 02: 59PM  
 11 written, does not preclude that.  
 12 Q. Is there in the standards, anywhere at all that  
 13 you have been able to ascertain, the use of the  
 14 word "unguided"?  
 15 A. It is in the definition of evolution and it's 03: 00PM  
 16 in the definition of--  
 17 Q. Where in the definition of evolution in the  
 18 standards do you find that?  
 19 A. The standard as it-- excuse me, let me start  
 20 this way, the standard does not have to mention 03: 00PM  
 21 that.  
 22 Q. So please answer my question. My question was  
 23 specifically to you, where in the standards is  
 24 the word "unguided" found?  
 25 A. It is found implicit in the definition of 03: 00PM  
 0223

1 evolution.  
2 Q. I'm not talking about implicitly. Where is the  
3 word "unguided" found?  
4 A. It is not in the standard and it doesn't have  
5 to be. 03: 00PM  
6 Q. If it doesn't have to be and if it's not in the  
7 standard, isn't it a fact that the only reason  
8 it is suggested in the comments for the  
9 minority is to have a strong man argument?  
10 A. Not at all. 03: 01PM  
11 Q. Not at all. You have made the claim from the  
12 floor that methodological naturalism entails  
13 that nature is unguided. What would you say to  
14 the millions of people, including many  
15 scientists, who believe that God works through 03: 01PM  
16 the natural process?  
17 A. Many of those people believe that it is guided  
18 through the natural process. Some of them  
19 believe that it is unguided through the natural  
20 process. 03: 01PM  
21 Q. Sir, you made the broad statement that  
22 methodological naturalism entails that nature  
23 is unguided, that's what you said.  
24 A. That's its definition. I didn't say that as if  
25 I was making it up. 03: 02PM  
0224  
1 Q. But that definition does not mean, does it,  
2 that there are not many, many thousands of  
3 scientists who believe that that is precisely  
4 how God works?  
5 A. I don't know that. 03: 02PM  
6 MR. IRI GONEGARAY: I have nothing  
7 further.  
8 EXAMINATION  
9 BY MS. MORRIS:  
10 Q. I'm sorry, pronounce your name. Is it Doctor 03: 02PM  
11 Simat?  
12 A. That's close enough.  
13 Q. How do you say it?  
14 A. Simat.  
15 Q. Welcome to Kansas. It's a beautiful state. 03: 02PM  
16 Maybe you'll get an opportunity to see some  
17 more of it. When you are testing your  
18 students, how do you handle this issue?  
19 A. Well, they have to know all of the evolutionary 03: 03PM  
20 theory and all of its tenets. Then I also ask  
21 them on all the additional information that I  
22 had brought forth into class that I cannot find  
23 in my textbook. So they have to know it all.  
24 Q. Okay. So in the State of Kansas in elementary 03: 03PM  
25 and secondary education we assess and the  
0225  
1 assessments are built around the standards, so  
2 what would be your advice to us as the Board  
3 who has the constitutional authority to provide  
4 general oversight, what should we do to make  
5 sure that students are taught evolution and its 03: 03PM  
6 criticisms and they are assessed on both items  
7 knowing that what's in the standards is what  
8 gets taught and is what gets tested?  
9 A. Here's how it works at Northwestern College, I  
10 do not work in the education department, I work 03: 04PM  
11 in the biology department. However, our

12 education department has a science methods  
13 class for K through 12. I come in for two  
14 lectures and I teach. After they-- excuse me,  
15 after they have taught them the evolutionary 03: 04PM  
16 tenets I come in and give the rest of the data  
17 of what, in fact, is out there, but not in the  
18 textbook of what is-- what is supportable and  
19 what is not supportable. So we do that with--  
20 actually it's four lectures, so we add that to 03: 04PM  
21 their curriculum. And I come in from the  
22 biology department because I have the  
23 information and the person who does the science  
24 methods cannot keep up with it. Although she's  
25 very knowledgeable. So we add that in there as 03: 04PM  
0226  
1 compliment to that after they learn all the  
2 tenets of evolution and then they are tested on  
3 knowing exactly what evolution can and cannot  
4 do in terms of true data and true conclusions.  
5 Q. So true data, true conclusions, if we want 03: 05PM  
6 quality education in Kansas we should also  
7 teach evolution and its criticisms, wouldn't  
8 you agree? Is that what you do at your school?  
9 A. Well, for macroevolution and origins, if you're  
10 going to teach just from the textbook and those 03: 05PM  
11 tenets of what it should be able to do, then  
12 you're not actually teaching the story-- the  
13 entire story of evolution, you're teaching a  
14 segment of it.  
15 Q. Okay. Thank you. 03: 05PM  
16 EXAMINATION  
17 BY CHAIRMAN ABRAMS:  
18 Q. Doctor Simat, how would you describe the  
19 ability of the Majority Draft, as well as the  
20 Minority Report to teach the students to 03: 05PM  
21 distinguish the data and testable theories of  
22 science from religion and philosophical claims  
23 that are made in the name of science?  
24 A. That was a long question.  
25 Q. How would you describe the ability of each one 03: 06PM  
0227  
1 of those, the Majority Report and the Minority  
2 Report, with reference to teaching the student  
3 to distinguish the data and testable theories  
4 of science from religious and philosophical  
5 claims that are made in the name of science? 03: 06PM  
6 A. Well, the modified program, modified document  
7 is going to go much further than the original  
8 with regard to expecting students to know  
9 exactly what science is. What I really detest  
10 is dunning down on science. And so I think 03: 06PM  
11 what the standard is saying is that you can, in  
12 fact, talk about all the data they're going to  
13 learn about and that's what those standards are  
14 going to show them that you can learn about  
15 exactly how far science can go in producing 03: 06PM  
16 data and making conclusions and where you must  
17 actually say now I'm emerging on a theory or a  
18 story that I think is probably true. But at  
19 least it becomes honest science when, in fact,  
20 you can differentiate the difference between 03: 07PM  
21 data dependent conclusions and data independent  
22 conclusions. And I think that's what the

23 standards have to show. That you can show the  
24 difference between those two things. This is  
25 data dependent conclusions and these are data 03: 07PM

0228

1 above the data or data independent conclusions.

2 Q. Okay.

3 A. So I think the standards can do that if you  
4 allow them to.

5 Q. Okay. Thank you very much. 03: 07PM

6 CHAIRMAN ABRAMS: Oh, Kathy.

7 EXAMINATION

8 BY MS. MARTIN:

9 Q. Oh, do we have some time. Our former  
10 presenter, Doctor Wells, and now I hear maybe 03: 07PM

11 you saying that in our textbooks we're not  
12 always getting a thorough coverage of

13 evolution. We may be getting a methodological  
14 naturalistic presentation. Okay. So maybe

15 this is one reason why we do need these 03: 07PM

16 proposals, these minority proposals in our  
17 standards to assure that our teachers are

18 realizing the textbook does not always cover  
19 the material to the best to show the short

20 comings. Is that what-- 03: 08PM

21 A. I think what Doctor Wells showed earlier on his  
22 map is an indicator that-- with his comments is

23 an indicator that there's a sweep across this  
24 country that would like to teach methods of how

25 to investigate and that's really the heart of 03: 08PM

0229

1 science. What I really like to do is get out  
2 of the classroom then and apply all those

3 classroom principles to actually how do we do  
4 methodology, how do we do science research and

5 follow that with fidelity and that's the issue. 03: 08PM

6 So-- and I think the standards have to reflect  
7 that we need to teach how we do science very

8 well and then, therefore, we'd be able to see  
9 that we can make conclusions or we can start

10 making something that becomes theoretical. And 03: 09PM

11 it's okay to have those theories.

12 UNIDENTIFIED SPEAKER: Two minutes.

13 A. I don't think we should take any of that, but  
14 we better claim what we can claim and tell what

15 is, in fact, beyond the data. 03: 09PM

16 Q. And then also from your introduction I  
17 understand that you had a perfectly good career

18 in biotechnology and you really were not aware  
19 of evolution as the way it was taught in the

20 textbooks, supposedly, and so that this lack of 03: 09PM

21 or de-emphasizing evolution is not going to  
22 ruin a student's chance of getting in the

23 biotechnology industry?

24 A. No, it doesn't stop-- although literally we are  
25 real close to 100 percent placement of our 03: 09PM

0230

1 students into medicine technology, graduate  
2 schools, almost everybody is going into what

3 they want to do. Evolution is not even asked  
4 about unless, of course, you were going into

5 evolutionary science at a university, they want 03: 09PM

6 to know do you-- where you stand with that. If  
7 you're going to become-- looking to work in

8 their department perhaps.

9 EXAMINATION

10 BY CHAIRMAN ABRAMS:

11 Q. Doctor Simat, I have been a proponent and  
12 stated earlier and will state again, like your  
13 comment on-- of imperical science being defined  
14 by observable, measurable, testable,  
15 repeatable, falsifiable and would you comment  
16 on that? 03: 10PM

17 A. Well, imperialism is the heart of science and  
18 once you start leaving imperialism it's okay,  
19 but you need to say it. You need to know the  
20 difference what is imperical and supportable 03: 10PM  
21 and what has, in fact, become more historic.  
22 I'm amazed at how well the reverse engineer  
23 stories look. They look very good and they're  
24 very compelling of how they're engineered, but  
25 they are, in fact, engineered. And we don't 03: 10PM

0231  
1 have data especially when it comes to  
2 historical science. That's total engineering.  
3 We have fun with the-- I actually brought  
4 photocopies of my textbook on general biology  
5 where they show the primordial soup. And I was 03: 10PM  
6 very entertained, amused. And it's very  
7 interesting, but there are so many--

8 UNIDENTIFIED SPEAKER: And that's  
9 time.

10 A. Thank you. There are so many tenets that have 03: 11PM  
11 to be perfect for that to happen. And so it's  
12 written that way that all of these things would  
13 have to have fallen in place. It's wonderful.  
14 It makes very nice reading. But, of course,  
15 it's historical science and it doesn't have any 03: 11PM  
16 data.

17 CHAIRMAN ABRAMS: Thank you, doctor  
18 Simat. We're going to take a 20-minute break.  
19 It is now 3:10, we're going to resume promptly  
20 at 3:30. 03: 11PM

21 (THEREUPON, a short recess was had).

22 CHAIRMAN ABRAMS: Sorry for the  
23 delay. We're going to get started again right  
24 now. Mr. Calvert.

25 MR. CALVERT: Yes. Doctor Abrams, 03: 32PM

0232  
1 members of the committee, as our next witness  
2 we would like to call Giuseppe Sermonti.  
3 Giuseppe, would you please come forward.

4 MR. IRIGONEGARAY: Just tell him to  
5 wait a second, we're having technical  
6 difficulties here. 03: 33PM

7 CHAIRMAN ABRAMS: Mr. Calvert, if  
8 you'd hold on just a second we're having some  
9 technical --

10 MR. IRIGONEGARAY: We're ready. 03: 33PM

11 CHAIRMAN ABRAMS: We're ready now.

12 MR. CALVERT: Okay.

13 (THEREUPON, the presentation of  
14 Giuseppe Sermonti was so heavily accented in  
15 Italian that this reporter could not understand  
16 what he was saying and so his presentation is  
17 not transcribed herewith).

18 MR. CALVERT: Our next and last



witness for the day is Doctor Ralph Seelke.  
Ralph.

04: 02PM

RALPH SEELKE,  
called as a witness on behalf of the Minority  
and testified as follows:

DIRECT EXAMINATION

BY MR. CALVERT:

Q. Doctor Abrams, members of the committee, I'd  
like to introduce you to Doctor Ralph Seelke.  
Doctor Seelke, would you please introduce  
yourself and provide a brief background of your  
qualifications to testify today about the  
Minority Report?

04: 03PM

A. Thank you. Again, my name is Ralph Seelke, I'm  
a graduate of Clemson University with my  
bachelor degree. My Ph.D. is in microbiology  
from the University of Minnesota. Actually my  
work was at the Mayo Clinic, however. I then  
did post doctoral training, I went from  
bacteria to chickens at the Mayo Clinic.

04: 04PM

04: 04PM

For the last 16 years I've been an  
associate professor or professor in the  
Department of Biology at the University of  
Wisconsin, Superior, so I think the cheese head  
that was referred to. Although I live in  
Minnesota, so-- but I have to be very guarded  
on my sport for the Packers and Vikings. It  
can be a serious issue.

04: 04PM

My primary duties, I'm primarily an  
instructor. My primary duties involve teaching

04: 04PM

courses of cellular, molecular, microbiology,  
genetics, immunology, and cell biology are  
primarily what I teach.

I've been following the conversation in  
the U.S. about the teaching of evolution for a  
number of years and that resulted in actually  
an active research interest in evolution. That  
has-- since I was trained as an experimental  
biologist when my interest was piqued by things  
like Darwin's Black Box, I immediately turned  
to experimentation. And my interest has been  
in determining by experimental methods the  
capabilities or limitations of the evolution  
process. And because of that interest I do try  
to stay informed about the research literature  
and experiments in literature. So I'm  
primarily here to speak about the use of micro  
evolution to produce inferences on macro  
evolution.

04: 05PM

04: 05PM

04: 05PM

Q. So how does that work, I mean tell us a little  
bit more about your experimental work?

04: 06PM

A. Oh, I'd love to take more time. Basically what  
experimental evolution does is we use  
experimentation to ask very specific questions  
about evolution. And this comes from the fact

04: 06PM

that primarily in bacteria there are numerous  
examples of evolution. And you can actually  
show my little power point, if we can do that.

4 But I actually had a table of some of the  
5 things-- that's not it. There's probably a 04: 06PM  
6 dozen or so very well documented cases of  
7 evolution in bacteria. And typically those  
8 cases involve a gain of function where you're  
9 able to make a new-- able to use a food source  
10 that a micro in the past was not able to use. 04: 07PM  
11 And so you can do real experiments with  
12 evolution. In a day you can produce a trillion  
13 organisms. So you can ask questions-- now, a  
14 trillion organisms is a lot of organisms. When  
15 you talk about human populations, we're talking 04: 07PM  
16 orders of magnitude more than the number of  
17 people who have ever lived on this planet, you  
18 know, since the beginning, wherever you want to  
19 determine that.  
20 So you can-- you can ask bacteria to do 04: 07PM  
21 very, very specific things and find out can  
22 they do it or can they not do it. So  
23 experimental evolution-- and you can also-- you  
24 can model time. One of my heroes is Richard  
25 Linskey at Michigan State. And Richard Linskey 04: 07PM  
0236  
1 has been evolving bacteria for 35,000  
2 generations. He does this-- it's actually his  
3 technicians do this, but he takes two teaspoons  
4 of bacteria and he grows them in a medium  
5 that's low on glucose. And then after they've 04: 08PM  
6 grown he takes a hundredth of that population  
7 and puts it in a new tube. He gets 6.64  
8 generations every day. He's been doing this  
9 for 15 years. You do the math, with a little  
10 work you can model trillions of organisms and 04: 08PM  
11 literally tens of thousands of generations.  
12 35,000 generations puts you in the range of  
13 what human evolution-- what is supposed to have  
14 happened in human evolution. So experimental  
15 evolution allows you to ask real questions 04: 08PM  
16 about what evolution can do and-- I have it on  
17 a CD.  
18 Q. Do you have it on a CD?  
19 A. It's over in the-- it was-- basically what I  
20 had is a chart of successful and unsuccessful 04: 09PM  
21 evolution experiments that happened. And by  
22 doing this there's a number that are  
23 successful, there are a number that are  
24 unsuccessful.  
25 Now, I'm rather proud that of that chart 04: 09PM  
0237  
1 of unsuccessful evolution. It is not easy to  
2 find. People don't tend to flaunt their  
3 failures. But I have been able to produce a  
4 chart of eight or ten cases of evolution where  
5 people looked very hard for evolution to take 04: 09PM  
6 place and it didn't happen. And so this is the  
7 sort of thing that can be readily done in this.  
8 So, yes, we can-- so that-- the chart was  
9 just-- just showed some examples of successful  
10 evolution and examples of unsuccessful 04: 10PM  
11 evolution.  
12 Q. Can you describe to me a-- in more detail a  
13 campaign of unsuccessful evolution?  
14 A. Well, one of the things I'm doing now is one of

15 the-- one of my other heroes is Michael Behe. 04: 10PM  
 16 And Behe said that if you have multiple  
 17 independent events that have to take place you  
 18 will simply not be able to observe evolution.  
 19 And so at this-- last year at this time I  
 20 was a visiting scholar at Stanford University 04: 10PM  
 21 and I basically built some molecules. I made  
 22 some changes in a gene and I put in one  
 23 mutation, two mutations, three mutations, and  
 24 four mutations all in different types of that  
 25 gene. All mutations inactivate the gene. And 04: 11PM  
 0238  
 1 so if this-- and then-- and now I'm in the  
 2 process-- I only have ten-- I only have ten  
 3 billion cells that I'm looking at which is  
 4 whoosy in this field. I wouldn't publish this  
 5 until I had probably 10 to 100 trillion, but-- 04: 11PM  
 6 so then I can take-- I can take these mutants  
 7 that I know exactly what they need to do to  
 8 evolve and I can ask them to evolve and put  
 9 them in a medium where if they do evolve I  
 10 would know overnight. Because the selective 04: 11PM  
 11 advantage of being able to make, in this case,  
 12 the amino acid triptiline is so enormous that I  
 13 would find that out overnight if that happens.  
 14 And so I can ask, what happens when you  
 15 need two mutations and only get an advantage 04: 12PM  
 16 when you have both. At this point the answer  
 17 is nothing. And that is actually supported by  
 18 the literature. What's different about this is  
 19 I am specifically asking these questions. Most  
 20 cases people-- these are things that people 04: 12PM  
 21 discover are kind of on the side. You know,  
 22 you don't do experiments to test the limits of  
 23 evolution and particularly my work is designed  
 24 to actually test that.  
 25 Q. How many would you say are working in the area 04: 12PM  
 0239  
 1 that you're working in right now?  
 2 A. There are a few people. It's-- it's sort of  
 3 boring research because you-- until things  
 4 evolve. We get really excited when things do  
 5 happen, but it's not-- yeah, they're not-- I'm 04: 12PM  
 6 probably a little fish in a little pond at this  
 7 point.  
 8 Q. Well, my understanding-- I think you mentioned  
 9 there was a scientist that's been running an  
 10 experiment now for 30 years? 04: 13PM  
 11 A. Well, he's been 35,000 generations. To my  
 12 knowledge he began this in the late '80s so  
 13 about 15 years. So, yeah, that's Richard  
 14 Linskey at Michigan State.  
 15 Q. And has he been able to demonstrate the 04: 13PM  
 16 development of new functions where you have to  
 17 have two steps?  
 18 A. One of the problems was he didn't ask a very  
 19 interesting question. He-- his micros are  
 20 evolving in a very low glucose. They're better 04: 13PM  
 21 at it. Most of what they got better at that  
 22 happened in 2,000 generations. So he's been  
 23 watching very, very slow advances since that.  
 24 2,000 generations is your first year. So he's  
 25 been looking at very, very slow advances since 04: 13PM

0240

1 then.  
2 Q. We have your power point.  
3 A. Oh, good. Oh, wrong one, wrong one. I'm  
4 sorry. That's-- you know, that's a lot longer.  
5 It was testimony. 04: 14PM  
6 Q. Let's see.  
7 A. It's okay. There's one good picture, other  
8 than that it's-- you can just close it out.  
9 Q. Just close this?  
10 A. Close it out, yeah. 04: 14PM  
11 Q. Okay.  
12 A. So the point is--  
13 Q. Oh, here we go.  
14 A. It's power point testimony of Ralph Seelke.  
15 Yeah, there it is. 04: 14PM  
16 Q. This one right here?  
17 A. Yeah, there it is. This is not really-- it's  
18 not really all that it's cracked up to be.  
19 Same one. Just close it out. There's one--  
20 that would be it, that's it. So then-- keep  
21 going. 04: 14PM  
22 So these are some examples of where  
23 evolution has worked. You have-- for instance,  
24 if you have-- you can put ten million bacteria  
25 that are able to use the sugar alcohol xylitol, 04: 15PM

0241

1 some of them will be able to produce an ability  
2 to grow on xylitol. The last example is one  
3 that has been batted around in the discussions  
4 on Intelligent Design. There is an evolved  
5 beta galactic slides that actually is both as  
6 an example of evolution and an example of when  
7 you ask it to do two things failure happens. 04: 15PM  
8 Barry Hall made a name for himself with  
9 evolved beta galactic ideas. Put that next  
10 slide up. Lactose use. This is system where 04: 15PM  
11 if you cut out the original enzyme for lactose  
12 use there is an enzyme hiding in e-coli that  
13 laws it to use lactose. However, you will  
14 never find this ever unless you cheat. And the  
15 way you cheat is by allowing lactose to come 04: 16PM  
16 in. And if you cheat, if you artificially  
17 stimulate that cell to allow it to have lactose  
18 come in, you will get mutations. But if you're  
19 asking it to do two things at once, you will  
20 never see that. And so it's an example of both 04: 16PM  
21 evolution and inaction-- and inaction of  
22 evolution.  
23 Q. What is-- can you put in perspective the  
24 conclusion that evolution can take one step--  
25 in one step will produce new functions, but 04: 16PM

0242

1 your work is suggesting that it cannot take two  
2 steps, what is the significance of that?  
3 A. Well, the significance of that is simply all  
4 over the place there are all sorts of things  
5 that don't get any advantage to the organism 04: 17PM  
6 until both things happen. Simple matter of  
7 using a sugar, to use a sugar you have to do  
8 two things. You have to bring it in and you  
9 have to use it. If you can bring in a sugar  
10 and you can't use it, you are not helped. If 04: 17PM

11 you can use the sugar, but you can't bring it  
 12 in, you're still starving. And Michael Behe  
 13 has made the flagellin, a scientific example of  
 14 this. Actually the flagella is worse than what  
 15 Behe says. Because if you're able to move and 04: 17PM  
 16 you don't know where you're going, you don't  
 17 have an advantage either. In the entire other  
 18 symptom that allows a bacteria to tell where  
 19 it's going that-- it's got sensors hooked up to  
 20 the motor that allow it to figure out where 04: 17PM  
 21 it's going and so it's worse than what Behe has  
 22 made out to be with the bacteria for the  
 23 flagellin. But there are large-- you know, all  
 24 over the place there are systems where nothing  
 25 happens unless you have multiple events taking 04: 18PM  
 0243  
 1 place. And to my knowledge that is the state  
 2 of experimental evolution. So when you are  
 3 saying you're producing new things by macro  
 4 evolution, it's a leap and an enormous leap.  
 5 You have not shown that. And as a matter of 04: 18PM  
 6 fact, the evidence is to the contrary.  
 7 Q. At that point what I'd like to do is how does  
 8 what you're talking about relate to the  
 9 proposed changes in the Minority Report? And  
 10 I'm putting up on the screen right now a 04: 18PM  
 11 reference to the proposed change and indicator  
 12 that have students understanding the difference  
 13 between micro and macroevolution. And I guess  
 14 I would ask you whether this suggestion,  
 15 additional specificity under paragraph D, is 04: 19PM  
 16 appropriate and is it appropriate to make a  
 17 distinction between micro and macro?  
 18 A. Sure. I would obviously agree that-- I think  
 19 microevolution is interesting. I think it's--  
 20 people should understand it. How you can do 04: 19PM  
 21 cool stuff evolving bacteria. But they should  
 22 understand the large difference between being  
 23 able to do that and being able to produce new  
 24 body forms for the other-- even the other  
 25 rather modest steps that would be needed in the 04: 19PM  
 0244  
 1 macroevolution scenario.  
 2 Q. Well, then the work you're talking about, the  
 3 biological experiment, involved bacteria?  
 4 A. Right.  
 5 Q. And is that actually you're working in a micro 04: 19PM  
 6 evolutionary paradigm?  
 7 A. Right.  
 8 Q. So you're actually not testing the macro  
 9 evolution?  
 10 A. It's hard to test. But in theory I am asking 04: 20PM  
 11 if macroevolution works by microevolutionary  
 12 steps. If macroevolution is simply the  
 13 extension, then knowing vigorously what micro  
 14 evolution can do will tell us what macro  
 15 evolution can do. And right now two steps seem 04: 20PM  
 16 to be required.  
 17 Q. Since Michael Behe's publication of his work,  
 18 "Darwin's Black Box" which discusses the theory  
 19 in great complexity and there's been a lot of  
 20 scientific debate over his concept, are you 04: 20PM  
 21 familiar with that?

22 A. Yes, I am.  
23 Q. And what would you say the current status is,  
24 has his idea been unrefuted, is it still being  
25 debated, what is the status? 04: 20PM  
0245  
1 A. Well, I think it's-- unfortunately not as many  
2 people have gone to a lab as I would have liked  
3 them to have gone to the lab for this sort of  
4 work. I think-- and that was one of my  
5 frustrations. 04: 21PM  
6 Behe and Ken Miller would get on public  
7 radio and Behe would say it can't evolve and  
8 Ken Miller would say it can to and Behe would  
9 say it cannot and Miller would say can to. And  
10 I'd think both of you guys go to a lab and 04: 21PM  
11 start doing some work. And so that sort of  
12 inspired me to do this.  
13 Now, Linskey has essentially failed to  
14 produce a lot of bacteria and he went to  
15 digital organisms. And he has shown that in 04: 21PM  
16 digital organisms, as long as each step is  
17 selected, you can get some very interesting  
18 things. But, yeah, he's gone to digital  
19 organisms, which are basically computer models  
20 of micro organisms and has shown that as long 04: 21PM  
21 as each step is advantageous you can do things,  
22 so-- which I think we--  
23 Q. Is it fair then to say that while micro  
24 evolution has been observed in the laboratory  
25 macroevolution has not and it's simply 04: 22PM  
0246  
1 inferred?  
2 A. Yes, I would say that's an accurate statement.  
3 Q. And the inference is drawn from what?  
4 A. Well, the inference is-- I think you start with  
5 the assumption that nature is all there is and 04: 22PM  
6 this is all we have to work with and,  
7 therefore, it-- we're here and there's nothing  
8 else that could have gotten us here, so,  
9 therefore, it must have worked even though it  
10 doesn't look like it could work. 04: 22PM  
11 Q. But you said you were starting with an  
12 assumption?  
13 A. Yeah, you start with that assumption. And, you  
14 know, if you start with the assumption, which 04: 23PM  
15 is what methodological naturalism does, you  
16 start with the assumption that nature is all  
17 there is, you will produce an explanation that  
18 comes out of nature. And if it's a bad  
19 explanation, go back to your assumption. You  
20 won't work beyond that assumption. 04: 23PM  
21 Q. This particular indicator, the second sentence,  
22 says, "These kinds of macroevolution  
23 explanations generally are not based on  
24 observations and often reflect historical  
25 narratives and based on inferences from 04: 23PM  
0247  
1 indirect or circumstantial evidence." Is that  
2 a scientifically valid statement?  
3 A. I think that's often true the observations are  
4 more narrative. Narrative as in speculation.  
5 Q. And I think you have answered this question, 04: 24PM  
6 can macroevolution explanation such as the

7 formation of new body plans be directly  
8 observed either in or out of the lab?

9 A. Those are harder experiments to do. Now, in  
10 terms of body plans in the field of 04: 24PM  
11 developmental biology there is real effort to  
12 produce things. There are some very  
13 interesting mutations that have occurred. I  
14 don't-- I would not say entirely new body  
15 plans, but some very interesting changes have 04: 24PM  
16 been made. One of my favorite is there are  
17 fruit flies with legs growing out of their  
18 heads and they're really cool, but that's not a  
19 real-- you know, doesn't help. There are  
20 also-- 04: 24PM

21 Q. So you would say that in a sense is macro  
22 evolution, but it is an evolutionary change  
23 that would kill an organism?

24 A. But these actually lived, but--

25 Q. Oh. 04: 25PM

0248

1 A. But they are not very good-- they're not very  
2 good flies. So that-- now, that's not a new  
3 body plan, that's a-- probably the closest has  
4 been some genetists have been able to add a set  
5 of wings to fruit flies. Unfortunately, that 04: 25PM  
6 second set doesn't work. So that's as close--  
7 that's changes to the basic body plan, I would  
8 not call that-- a new body plan would be going  
9 from a worm to an insect.

10 Q. The second set of wings, does that add to the 04: 25PM  
11 function of the fly or reduce its function?

12 A. No. Having a set of wings that doesn't work is  
13 not particularly a good thing to do to a fly.

14 Q. Going to-- I have on the screen here indicator  
15 1 A. Is that a scientifically valid addition 04: 25PM  
16 to the description of biological evolution,  
17 biological evolution postulates an unpredicted  
18 and unguided natural process that has no  
19 discernible direction or goal?

20 A. Yes, I think that's a very accurate statement 04: 26PM  
21 of evolution as it's typically-- and it has to  
22 be because we're talking natural sources,  
23 natural processes, and can't have a guide.

24 Q. And then the second sentence, it also assumes  
25 that life arose from an unguided natural 04: 26PM

0249

1 process?

2 A. Right.

3 Q. Okay. I'd like to move to the indicator 4--  
4 6-- indicator 6, subparagraph C of the 04: 26PM  
5 additional specificity where we're talking  
6 about natural selection, genetics draft genomes  
7 and mechanisms of genetic change provide a  
8 context in which to ask research questions and  
9 help explain observed changes in populations.  
10 However, reverse engineering and indirected 04: 27PM  
11 thinking are used to understand the function of  
12 bio systems and information. Is that an  
13 appropriate addition and could you comment on  
14 that?

15 A. Yes, I think that's-- actually as someone 04: 27PM  
16 who's-- who loves experimental science and who  
17 thinks that teaching is-- you can get kids

18 excited about things. I think this is actually  
 19 a very useful -- I don't like this word, but  
 20 I'll use it, pedagogical tool, in the sense 04: 27PM  
 21 that if you tell students they can understand  
 22 the things by simply asking, well, if you were  
 23 a bacteria, what would you do. And it turns  
 24 out the answers that they come up with are  
 25 reasonable and rational and right. That the 04: 27PM

0250  
 1 micro actually-- well, one person says we're  
 2 not intelligent, but they do the intelligent  
 3 thing.  
 4 If I want to understand the system-- as a  
 5 matter of fact when I teach my students how 04: 27PM  
 6 bacteria use lactose I tell them exactly that.  
 7 What would you do if you were a bacteria?  
 8 Well, if you've got lots of other sugars around  
 9 and lactose is hard to use, I'd use that first.  
 10 Well, that's exactly what the bacteria does. 04: 28PM  
 11 If you have a bunch of genes that are needed to  
 12 make lactose when are you going to turn those  
 13 on? Well, let's turn them on when the glucose  
 14 runs out. Good idea. That's exactly what the  
 15 bacteria does. And so rational -- teaching, you 04: 28PM  
 16 know, from a rational standpoint that-- and,  
 17 again, you don't have to claim that they're  
 18 rational or design, you simply-- you can quote  
 19 Dockins if you want to, that things simply  
 20 appear designed. But as a teaching methodology 04: 28PM  
 21 this provides a very good handle for  
 22 understanding systems.

23 Q. There is another indicator-- let me-- before  
 24 you pass that, you understand what  
 25 methodological naturalism is? 04: 29PM

0251  
 1 A. Yes.  
 2 Q. Would you say that in this one indicator where  
 3 you're asking the student to look at the  
 4 bacteria-- that if you were the bacteria how  
 5 would you do that, that's sort of a logical or 04: 29PM  
 6 design directed, is it fair to say that in that  
 7 kind of methodology you're actually using  
 8 methodological design rather than  
 9 methodological naturalism?  
 10 A. That's probably a good description. And you 04: 29PM  
 11 can certainly simply say that this works. It  
 12 works as a way of understanding. If you're--  
 13 if you're looking at the structure of a set of  
 14 genes, well, if gene A-- genes A, B, and C are  
 15 all involved in the same process, where-- if 04: 29PM  
 16 you find out where gene A is, where do you  
 17 think gene B. Well, if you were the bacteria  
 18 where would you put gene B? Well, how about  
 19 right next to gene A and it turns out that  
 20 you're generally right. 04: 30PM

21 So that-- and that approach, that's what  
 22 scientists do. Whether they acknowledge it or  
 23 not, they look at this and they say how would I  
 24 do this if I were the micro. And the creative  
 25 ones figure it out, do the experiments to test 04: 30PM

0252  
 1 that and they sort through the possible answers  
 2 and that's generally how science advances.



3 Q. I have on the screen an indicator that would  
4 have students understand that the sequence of  
5 the nucleotide process within genes is not 04: 30PM  
6 dictated by any amount of chemical or physical  
7 law. Is that a scientifically accurate and  
8 valid statement?

9 A. Yes, that's an accurate statement. And it's--  
10 it has to be accurate. As a matter of fact for 04: 30PM  
11 years one of the reasons the discovery of DNA  
12 and the genetic material was a late discovery  
13 historically was because we thought DNA was  
14 boring. We thought it had a very repeated  
15 structure, that it was holding proteins 04: 31PM  
16 together because proteins were interesting and,  
17 therefore, they had to be the genetic material.  
18 And because we thought that, because we thought  
19 it was repeated and boring, therefore, it could  
20 have no information. If it weren't-- if there 04: 31PM  
21 was a law that says R has to be next to T and T  
22 had to be next to C and C had to be next to G  
23 then you would have no information. So in  
24 order to be an informational molecule you can't  
25 have the order dictated by law. 04: 31PM

0253  
1 UNIDENTIFIED SPEAKER: That's two  
2 minutes.

3 Q. (BY MR. CALVERT) And that brings up another  
4 question is that indicator one of standard 04: 31PM  
5 seven, benchmark three, this is a description  
6 of scientific knowledge. And the Majority  
7 Report would have scientific knowledge describe  
8 and explain the physical world in terms of  
9 matter, energy, and the forces. Whereas the  
10 Minority proposes that we simply say scientific 04: 32PM  
11 knowledge describes and explains the natural  
12 world. Which in your view is the better  
13 statement?

14 A. Well, I think there's the glaring admission--  
15 omission, excuse me, in the definition of as it 04: 32PM  
16 is is information and the other is that I think  
17 it would--

18 Q. You mean biological information?

19 A. Biological information, exactly.

20 Q. And could you be a little bit more specific 04: 32PM  
21 about what you mean by that?

22 A. It's the code. It's the DNA. It's the  
23 sequences.

24 Q. The messages?

25 A. The message. The message is what matter, 04: 33PM

0254  
1 energy, even forces can explain.

2 Q. And so since you cannot reduce science-- if you  
3 did reduce science to just a physical world,  
4 then you would omit the investigation of  
5 biological information? 04: 33PM

6 A. Yes, I think that's-- that's one of the things.  
7 Or your understanding would be quite  
8 constrained. But it has to be approached as  
9 information.

10 Q. Finally, we have about ten seconds, sequence of 04: 33PM  
11 nucleotide bases within-- oh, we already talked  
12 about that. I think that's about it. Doctor  
13 Seelke, do you have any general comment on the

14 proposed changes that are contained in the  
 15 Minority Report? 04: 33PM  
 16 A. I think you'll have-- you'll have a group of  
 17 students who will be much more aware. They'll  
 18 be-- they'll have a better understanding of  
 19 evolution. They will not be-- they will not  
 20 accept it unthinking. Those who accept it will 04: 34PM  
 21 have accepted it in the light of the  
 22 criticisms, so they will be stronger because of  
 23 that. Those who doubt it will know why they  
 24 doubt it, rather than simply having been told  
 25 to doubt it. And I think you'll-- now, this is 04: 34PM  
 0255  
 1 a subject where being sure may not be the best  
 2 thing in the world. You may want people who  
 3 don't know the answer because that may be the  
 4 better place. You know, not-- if you don't  
 5 know something and you know you don't know 04: 34PM  
 6 something, you're better off than if you don't  
 7 know it and you think you know it. So I think  
 8 you'll have a better educated population.  
 9 Q. Thank you so much for your testimony.  
 10 CHAIRMAN ABRAMS: Mr. Irigonegaray, 04: 34PM  
 11 15 minutes.  
 12 THE WITNESS: Yes, I do believe 4.5  
 13 billion years.  
 14 MR. IRIGONEGARAY: I'm glad to hear  
 15 that. We have no questions for you. 04: 35PM  
 16 CHAIRMAN ABRAMS: No questions?  
 17 MR. IRIGONEGARAY: No.  
 18 MS. MARTIN: This is-- this was  
 19 fascinating again and you lost me quite a ways  
 20 back, but I tried to stay with you. And, you 04: 35PM  
 21 know, the idea that you could do this with  
 22 bacteria is just fascinating to me. And I  
 23 applaud your efforts. Even though you say  
 24 there are not very many of you, you're a  
 25 minority working in this field, but we think 04: 35PM  
 0256  
 1 you're a true scientist and we really  
 2 appreciate all the things you're trying to do  
 3 to keep science-- you know, doing the right  
 4 thing and letting children learn what true  
 5 scientists do and I appreciate it. 04: 35PM  
 6 THE WITNESS: Thank you.  
 7 EXAMINATION  
 8 BY MS. MORRIS:  
 9 Q. Well, I welcome you also, Doctor Seelke. Your  
 10 closing comment gave me some confidence that I 04: 35PM  
 11 might try to attempt to converse with you.  
 12 When you said that as long as, something like,  
 13 if, you know, you don't know then you're in a  
 14 good place, so I don't know a whole lot about  
 15 this subject. I find it fascinating and I 04: 36PM  
 16 really appreciate you taking the time to come  
 17 and speak with us and help us to understand.  
 18 Now-- so let me see if I have this right.  
 19 Basically you use microevolution trying to  
 20 create macroevolution or is it backwards? 04: 36PM  
 21 A. Well, no, I think that's accurate. I think if  
 22 I were to-- if I could consistently show that  
 23 multiple-- that there's-- that you can  
 24 consistently with bacteria if you need two or

25 three or four events and you can get them to 04: 36PM  
0257  
1 happen, I would be-- I wouldn't be rich, but I  
2 might be famous, because that would-- that  
3 would throw ID out the window. And I think--  
4 and if that experiment were to work it would  
5 throw ID out the window. 04: 37PM  
6 And just to point out the importance of  
7 this, Barry Hall in 1991 thought he showed that  
8 bacteria could do two mutations, that they-- he  
9 had a system very similar to mine where nothing  
10 happened in theory until two things happened. 04: 37PM  
11 Okay. And he thought he had a-- he thought he  
12 was able to observe that. That was in 1991.  
13 All right. He got a paper and prestige from  
14 the National Academy of Science. That's a very  
15 prestigious journal. And so the point was, you 04: 37PM  
16 know, you could-- you know, I don't think it  
17 made the front page news, but it made-- you  
18 know, it made a prestigious journal.  
19 In 1998 some one named Clarence thought  
20 he found the mechanism where bacteria-- if a 04: 38PM  
21 mutation was advantageous that it would happen  
22 more often. So instead of being random, it was  
23 something that would happen more often. He  
24 also made big news in the scientific circuit.  
25 So the point is that this is not-- people may 04: 38PM  
0258  
1 not want to invest their careers in it, but  
2 they find it interesting.  
3 And one of my-- I think one of the things  
4 that is helpful and this is why being skeptical  
5 of evolution, and this is where an attraction 04: 38PM  
6 to design comes in, is the evolutionists don't  
7 ask these questions because if you know that--  
8 you know, I ask what evolution can really do,  
9 you don't ask bacteria to evolve because you  
10 know the answer right away. And so it's only 04: 38PM  
11 when you step out of that paradigm and you say,  
12 well, maybe it doesn't have all the answers  
13 that you even ask the question. And so that's  
14 why I think-- I think this skepticism of  
15 evolution is good for science. It needs-- 04: 39PM  
16 evolution needs an opposing theory because it  
17 will just sit on its haunches and spin "just  
18 so" stories that everybody is happy with. And  
19 so that's why if you have someone from the  
20 outside saying it ain't necessarily so and, you 04: 39PM  
21 know, let's do some experiments where other  
22 people are happy just with "just so" stories,  
23 you are helping science.  
24 Q. When you have a fruit fly that grows a second  
25 pair of wings that don't work, why is that not 04: 39PM  
0259  
1 a mutation or a change, why would one argue  
2 that's evolution?  
3 A. Yeah, it's a mutation. Certainly it's a  
4 mutation and you could call it evolution. You  
5 know, it's a change with time. That was 04: 40PM  
6 actually-- that one-- if I remember correctly  
7 and I-- that actually two, three steps and that  
8 was a highly engineered-- that was a highly  
9 engineered change. I think the developmental

10 biologists wanted to see if they could do it. 04: 40PM  
11 Q. I'll rest my curiosity. Thank you.

EXAMINATION

12 BY CHAIRMAN ABRAMS:

13 Q. Doctor Seelke, earlier today we heard that  
14 evolution is a rather slippery word, therefore, 04: 40PM  
15 when you're describing evolution and bacteria  
16 what is happening, what-- would you be more  
17 specific about that word?

18 A. Well, I would-- what I'm doing is  
19 microevolution. But, again, if you make the 04: 40PM  
20 assumption that macroevolution occurred by what  
21 we can see in microevolution, what I'm trying  
22 to do is vigorously push what we know micro  
23 evolution can do. And, again, if we can-- if  
24 we can push that, that is how a plausible 04: 40PM  
25

0260

1 theory of macroevolution would come about.  
2 And what I see is unfortunately most  
3 people are just satisfied with the stories that  
4 they don't want to push microevolution to find  
5 out what it could do. You know, they're 04: 41PM  
6 satisfied with saying, you know, we take this  
7 it happened several million years by the same  
8 thing and out comes a macroevolution or a  
9 change. And so I am-- I would say I'm doing  
10 microevolution with an attempt to understand 04: 41PM  
11 what it can do, which has implications towards  
12 macroevolution.

13 UNIDENTIFIED SPEAKER: Two minutes.  
14 Q. (BY CHAIRMAN ABRAMS) Are you saying that the 04: 41PM  
15 evolution in the bacteria that you are doing  
16 and the other experiments that you have been  
17 describing are actually adding genetic  
18 material?

19 A. What I would do-- now, the ones that I am  
20 doing, you would be-- you would be-- yes, you 04: 41PM  
21 would-- that is a-- there is a small edition--  
22 right, there's an addition of capabilities that  
23 occurs. Now, if I-- for instance, if I take my  
24 gene and I have one mistake in it and by random  
25 processes that one mistake can be fixed. And I 04: 42PM

0261

1 think you would say that, yes, that cell is  
2 better and it has gained a little bit of  
3 information. It is-- it hasn't-- this is a  
4 small gain that produces a very large change.  
5 The gene that I'm looking at has 268 amino 04: 42PM  
6 acids, 267 of them are right. Okay. There's  
7 one mistake. There's one base change causing  
8 one amino acid change and the thing is broke.  
9 And so, yeah, I'm making one change. Has that  
10 cell gained information? It would appear, yes, 04: 42PM  
11 that it has gained information. Not a lot of  
12 information.

13 Q. I would-- where I'm going with that is that can  
14 bacteria become resistant to antibiotic? I 04: 43PM  
15 have been under the impression by reading and  
16 involvement with it, that it is not necessarily  
17 an added amount of genetic material, but is  
18 actually a dysfunction that allows those  
19 bacteria to become resistant and therefore  
20 multiply and then-- but it is not an actual 04: 43PM

added genetic material?

- A. It's not a net adding, but it's-- it would be--  
how can I compare it? It's like you have a  
word and it's misspelled and you fix the word.  
Have you added information by fixing the word,

04: 43PM

you still have seven or eight letters.

UNIDENTIFIED SPEAKER: That's time.

- A. So it's-- it's-- I think this may be semantics.  
Q. Time is up. There is others, but I thank you  
for your time.  
A. Thank you.

04: 43PM

CHAIRMAN ABRAMS: We will convene at  
8: 30 tomorrow morning. Thank you for coming.

C E R T I F I C A T E

STATE OF KANSAS

COUNTY OF SHAWNEE

ss:

I, Jana L. Willard, a Certified  
Shorthand Reporter in and for the State of  
Kansas, duly commissioned as such by the  
Supreme Court of the State of Kansas, do hereby  
certify that I was present at and reported in  
shorthand the foregoing proceedings had at the  
aforementioned time and place; further that the  
foregoing 262 pages is a true and correct  
transcript of my notes requested transcribed.

IN WITNESS WHEREOF, I have hereunto  
affixed my Official Seal this \_\_\_\_\_ day of  
\_\_\_\_\_, 2005.

\_\_\_\_\_  
Jana L. Willard  
CERTIFIED SHORTHAND REPORTER