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NATIONAL SCIENCE BOARD

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COMMISSION ON 21ST CENTURY EDUCATION IN
SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

- - -

FRIDAY, AUGUST 4, 2006

TIME: 8:30 A.M. to 12:18 P.M.

1 MEMBERS PRESENT:

2 DR. LEON M. LEDERMAN

3 Commission Co-Chairman

4 Resident Scholar, Illinois Mathematics

5 and Science Academy

6 DR. SHIRLEY MALCOLM

7 Commission Co-Chairman

8 Head, Directorate for Education and Human

9 Resources Programs, American Association

10 for the Advancement of Science (AASS)

11 DR. JO ANNE VASQUEZ

12 Commission Vice-Chairman

13 Member, National Science Board

14 Mesa Public Schools, Retired

15 THE HONORABLE NANCY KASSEBAUM-BAKER

16 Former United States Senator (R-KS)

17 MR. RONALD D. BULLOCK

18 Chairman and CEO

19 Bison Gear and Engineering

20 St. Charles, IL

21 -- continued --

22

1 MEMBERS PRESENT:

2 DR. KAREN SYMMS-GALLAGHER

3 Dean

4 Rossier School of Education

5 University of Southern California

6 DR. JAMES M. GENTILE

7 President

8 Research Corporation

9 Tucson, AZ

10 MS. MARIA A. LOPEZ-FREEMAN

11 Executive Director

12 California Science Project

13 DR. MARITZA B. MACDONALD

14 Director of Professional Development

15 American Museum of Natural History

16 New York City

17 MR. TIMOTHY D. McCOLLUM

18 Science Teacher

19 Charleston, Illinois Middle School

20

21 -- continued --

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1 MEMBERS PRESENT:

2 DR. CINDY Y. MOSS

3 Director of K-12 Science

4 Charlotte/Mecklenburg, North Carolina

5 Public Schools

6 MR. LARRY G. PRICHARD

7 Superintendent

8 Carter County (Kentucky) Schools

9 THE HONORABLE LOUIS STOKES

10 Former United States Congressman (D-OH)

11 DR. ELIZABETH STRICKLAND

12 Commission Executive Secretary

13 OTHER PARTICIPANTS:

14 DR. STEVEN C. BEERING

15 Chairman

16 National Science Board

17 DR. MICHAEL P. CROSBY

18 Executive Officer

19 National Science Board

20

21 -- continued --

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1 OTHER PARTICIPANTS:

2 DR. JOSE-MARIE GRIFFITHS

3 University of North Carolina

4 at Chapel Hill

5 New Board Nominee

6 DR. JOHN STRAUSS

7 Board Member

8 DR. BETSY HOFFMAN

9 University of Colorado

10 Board Member and Chair

11 Education and Human Resources

12 Committee

13 DR. DAN ARVIZU

14 Director, National Renewable Energy Lab

15 Chair, Audit and Oversight Committee

16 Board Member

17 DR. ELIZABETH STRICKLAND

18 Executive Secretary to Commission

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1 P-R-O-C-E-E-D-I-N-G-S

2 (8:30 A.M.)

3 SESSION III

4 CALL THE MEETING TO ORDER

5 DR. CROSBY: I would like to call this first
6 meeting of the National Science Board's Commission on
7 the 21st Century Education in Science, Technology,
8 Engineering, and Mathematics Part II to order.

9 Please turn off all of your cell phones and
10 any other electronic noisemaking devices. Just to
11 comment at the beginning, the Commission is a federal
12 advisory committee established by the Board, and it
13 operates in accordance with the requirements of the
14 Federal Advisory Committee Act.

15 The Commission's role is advisory, and no
16 decisions will be made in this forum that deal with
17 disposition of official agency business. Meeting
18 attendees, including the NSF staff that may be
19 present, are requested to sign in on a list that's out
20 at the front door.

21 Copies of the agenda, the names and
22 affiliations of the meeting participants, and other

1 background material are also available there. With
2 that, I will turn the proceedings over to the
3 Commission Co-Chair, Dr. Leon Lederman.

4 CO-CHAIR LEDERMAN: Thank you. It is a
5 great pleasure to introduce Norman Augustine who very
6 kindly found room in his schedule for us. He was of
7 course chairman and chief executive officer of
8 Lockheed Martin, and during a distinguished career he
9 also served as chair of the National Academy of
10 Engineering, under secretary of the Army, a faculty
11 member in the Department of Mechanical and Aerospace
12 Engineering at Princeton. Princeton comes up a lot
13 these days in our discussions.

14 Most recently, Norm has chaired the
15 Committee on Prospering in the Global Economy of the
16 21st Century. The report widely read and commented
17 upon, "Rising Above the Gathering Storm," is clearly a
18 very important issue for this Commission. We look
19 forward very much to having Norm tell us about that
20 commission and, presumably, giving us an arrow towards
21 how this Commission will proceed.

22 Norm, thanks very much for being here.

1 UPDATE ON RISING ABOVE THE GATHERING STORM

2 MR. AUGUSTINE: Well, thank you. I think
3 I'll stand, if I may.

4 (PowerPoint" presentation in progress.)

5 MR. AUGUSTINE: If you will pardon me, not
6 to make this formal, but I can see everybody if I
7 stand here, so it works a little bit better. I was
8 thrilled when Leon asked me to speak to you for
9 several reasons.

10 One is when Leon tells me to do something, I
11 do it. Secondly, you have an opportunity to take the
12 considerable effort that my colleagues put into what
13 they did one step further. I think you had a chance
14 to make some things happen that we just laid out
15 outlines for.

16 I am enormously pleased, one, to see you
17 doing this; two, to be able to be here; and, number
18 three, to see the amount of talent and commitment on
19 your Commission.

20 As I understand it, my role this morning is
21 to take 20 to 25 minutes to tell you about what we did
22 and some thoughts that might be helpful to you as you

1 undertake your work, and then of course I welcome
2 discussion as you see fit.

3 In preparation for your meeting, your staff
4 was kind enough to send me some reports from the past
5 of topics you're dealing with. The first one I
6 flipped open and I started reading, I said, "Oh, it's
7 our report. Somebody has put it out under another
8 cover." Well, the truth is it was "A Nation At Risk,"
9 published in 1981.

10 There are not a lot of new ideas in our
11 report. There are not a lot of new problems
12 identified. That report in 1981, that was a very
13 perceptive report. It was pointing out what was the
14 leading edge of a growing tidal wave. Today, the wave
15 is one that is hard not to see, and it's likely to
16 become more visible in the future.

17 I should also tell you in the way of preface
18 that our report was not a study of education. We
19 didn't start out studying education. We didn't start
20 out studying education. That was not our purpose.
21 Our purpose was to study competitiveness of America,
22 and, more specifically, the quality of life that

1 Americans can expect to enjoy in the future.

2 Our thrust was very straightforward. First
3 of all, the individual and collective prosperity of
4 Americans in the future as in the past is likely to
5 depend to a very great extent upon Americans having
6 the availability of quality jobs.

7 Secondly, we are aware of a large number of
8 studies, eight to be exact, by economists that have
9 shown that the growth in America's GDP in the last
10 50 years, 50 percent to 85 percent is attributable to
11 science and technology.

12 One, jobs are fundamental to our prosperity
13 and quality of life; and, two, many of those jobs are
14 likely to depend on science and technology and our
15 prowess in those fields.

16 The background in terms of the logistics of
17 our effort is traced to a meeting at the National
18 Academy of Sciences, and it involved Senator
19 Lamar Alexander who subsequently together with
20 Senator Bingaman and later joined by
21 Congressman Sherri Bullard and Mark Gordan sent a
22 letter to the three academies, or the two academies

1 and the Institute of Medicine asking them jointly to
2 put together a group to take a look at America's
3 future competitiveness, prosperity, and to make
4 recommendations.

5 We were given 90 days to conduct our study,
6 which is kind of good news and bad news. The good
7 news is it probably wouldn't have been any better if
8 we'd had three years, and it would have taken more
9 time.

10 The other thing that we learned, though, is
11 at the end of the 90 days we had just begun our work.
12 That's a suggestion I would make to you. When you
13 turn in your report, unless you want it to end up on
14 one more shelf down the hall here like so many others,
15 it's important to follow up and tell people about what
16 your report says.

17 We collected 20 individuals, about a third
18 of whom were CEOs or retired CEOs of major
19 corporations: ExxonMobil, Dupont, Intel, and so on,
20 presidents of a number of universities. We had a
21 number of former presidential appointees, three Nobel
22 Laureates in the group and so on.

1 It was a very diverse group, and that was by
2 intent. We asked 21 people to serve and 20 agreed.
3 It meant giving up most of their last of summer, which
4 speaks to how important at least that group felt the
5 topic was.

6 We had, as the academies always do,
7 reviewers. In fact, we had 37 anonymous reviewers
8 oversee our work. I don't know if you're going to get
9 that privilege or not. It certainly sharpens your
10 report. It was a great asset, but it was also a huge
11 amount of effort.

12 We began by inviting in 60 subject matter
13 experts, people who had spent their careers on issues
14 of the type that we were going to address. They spent
15 a full weekend here with us here in Washington. Each
16 was asked to give us a list of the three things they
17 would do if they had our responsibility for this
18 report.

19 The thrust of the report clearly moved in
20 the directions of science and technology and
21 education. We made four major recommendations and
22 20 very specific implementing actions. The four major

1 recommendations in order of priority, and as I said we
2 didn't start out studying education let alone K-12,
3 our number one priority was K-12 education. I'll come
4 back to be a little more specific.

5 The second was to double the basic research
6 budget funding by the government in seven years in the
7 physical sciences, math, and engineering.

8 The third was to address the issue of the
9 number and quality of researchers and engineers at the
10 higher level of the pyramid, if you will, in terms of
11 creating basic knowledge.

12 The fourth was to address just problems with
13 the basic innovation system. I won't talk about those
14 this morning, but I'll just rather briefly mention and
15 give you a couple of ideas of the sorts of problems
16 that are out there.

17 One is you may not be aware that American
18 companies today spend more on litigation than we spend
19 on research and development. You probably are aware
20 that American companies are among the few in the world
21 that fund health care for their employees' families
22 and their employees, which is a wonderful thing to do,

1 but it adds to cost in the marketplace.

2 Today, General Motors spends more money on
3 healthcare than on steel. Starbucks spends more money
4 on healthcare than coffee. You can go down the line.
5 There are any number of these things that need to be
6 addressed.

7 Our immigration and visa laws help drive out
8 qualified scientists. It's not that they are neutral
9 or constructive. They actually drive out of the
10 country competent scientists and students who would
11 like to be scientists in our country.

12 I should comment, too, that others in the
13 world have certainly noted the kinds of things that we
14 recommended. In fact, just two weeks ago,
15 President Hu in China had all the members of the Polit
16 Bureau present for a meeting of their National Academy
17 of Science and Engineering. That means nine people.
18 Of the nine, eight are engineers and one is a
19 geologists.

20 In the U.S., for example, in the House of
21 Representatives, there are more people who list
22 themselves as entertainers and actors than do as

1 engineers.

2 Therefore, there is a clear understanding in
3 a lot of parts of the world of the importance of
4 education in science and engineering.

5 To kind of lay out the background for where
6 our report headed, we came across the term "the death
7 of distance." One of the developments of the last
8 half century where, indeed, distance has died in the
9 sense that for the first time many, if not most,
10 transactions among people could be conducted by people
11 who are not in the physical proximity of one another,
12 particularly in terms of business transactions,
13 competitiveness issues.

14 Let me give you just a few examples. There
15 is an office building in downtown Washington, right
16 near the White House, that if you go in their lobby
17 there is a very pleasant lady who appears on a
18 flat-screen display in the lobby who will help you get
19 your appointments set up and to the right room and
20 through the security gate and so on. It turns out she
21 is not in Washington; she is in Pakistan.

22 (General laughter.)

1 MR. AUGUSTINE: You're all familiar with
2 picking up the phone and talking to somebody in
3 Bangalore at the call centers there. They now have
4 courses in Bangalore to teach you to speak with a
5 Midwestern Kansas accent so that you will appear more
6 friendly to the people who are calling.

7 If you have a CAT scan in many
8 U.S. hospitals, it will be read by a doctor in
9 Australia or in Bangalore. Your income tax, there is
10 a good chance if you had it done by one of the
11 Big Four, that a good part of it was prepared actually
12 in Costa Rica.

13 I have a friend who had robotic surgery a
14 while back. The surgeon was not even in the same
15 place. You could have a world-class surgeon somewhere
16 across the ocean operate on you in this country. I
17 hope they have backups in the room. I hope they have
18 at least an instruction book of what to do in an
19 emergency.

20 (General laughter.)

21 MR. AUGUSTINE: The point that I would like
22 to make is many Americans have thought that the

1 problem of the death of distance is associated with
2 the lower end, if you will, of the employment
3 spectrum, assembly work and routine work. Not so. It
4 is permeating the entire spectrum. There are very few
5 jobs that are likely to be safe.

6 The former head of the Federal Reserve some
7 time ago had made the comment that janitors and crane
8 operators are probably immune to foreign competition,
9 and that was about the extent of it.

10 Will we all wind out working at McDonald's?
11 The answer is no. The reason is we won't be able to
12 get those jobs. McDonald's today has an experiment
13 underway that when you drive into their drive-in
14 window and place your order for your burger and your
15 fries, your voice is transmitted 23,000 miles up to a
16 satellite at sectoral orbit and back down to the
17 central call center where they have people who are
18 really good at taking orders. They get it right.

19 Then, they put it in digitally, send it back
20 up, and back to the person who prepares your hamburger
21 and fries. They have cut their error rate in half and
22 increased the throughput by 20 percent. The call

1 center today happens to be in Colorado Springs, but
2 that's purely an accident. It could be anywhere in
3 the world.

4 Tom Friedman has said that "Globalization
5 has accidentally made Beijing, Bangalore, and Bethesda
6 next door neighbors."

7 Well, what does all this mean? What is the
8 link to education? To this audience, it's obvious.
9 When you sit in a boardroom and try to decide where to
10 build a new plant or research facility or what have
11 you that will employ a lot of people and create jobs,
12 which underpins the quality of life, there are a
13 number of factors that go into that decision.

14 I added it up, and I can't believe it. I've
15 sat in over 500 board meetings of Fortune 100
16 Companies in my life. The conversation usually starts
17 out, "Well, what's the cost of labor?" Let's talk
18 about that.

19 Particularly among engineers and scientists,
20 you can hire nine engineers in China for the cost of
21 one in America. You can hire five chemists in India
22 for the cost of one in America. If you're talking

1 about laborers, you can hire about 10 in Mexico for
2 the cost of one in America. Or, you can hire 20 in
3 Vietnam for the cost of one in America.

4 The bottom line is we're going to lose when
5 it comes to cost of labor, so whatever else we do
6 we've got to be really good at to offset that. That
7 that thing that we have to be really good at, our
8 group concluded there was only one thing that could
9 make us competitive, and that's to out innovate the
10 rest of the world or to be at least among the
11 world-class countries when it comes to innovation.

12 I should say one thing in terms of this
13 issue of your job is just a mouse click away to
14 somebody else. The question comes up: isn't it a good
15 thing that the rest of the world is prospering? Our
16 commission comes out very clearly on that, that it's a
17 terrific thing.

18 It's good for everybody. It's good for
19 other people. It probably makes the world more
20 stable. It creates more potential customers for our
21 products and then, alternatively, it creates more
22 products for American consumers; so, it is good.

1 However, the point is that America is very likely to
2 be left behind if we don't do some things very
3 differently.

4 There is also the question arises: but
5 things are going pretty well, aren't? I mean, the
6 economy looks pretty good. We created two million new
7 jobs last year.

8 Most studies around the world suggest that
9 something like eight out of ten of the finest
10 universities are in America. Household wealth last
11 year crossed the \$50 trillion mark. Also, we have the
12 great advantage of our free enterprise system as we
13 practice it, a system that is very forceful in
14 eliminating the noncompetitive in favor of the
15 competitive.

16 All of those things are certainly to our
17 advantage. The problem is that all the trends that we
18 could see, virtually all are in the wrong direction.
19 Worst yet, this whole issue of competitiveness,
20 quality of life and education -- there is not going to
21 be a 9/11 or a Sputnik or a Pearl Harbor. It is more
22 like the frog slowly boiling. There is need for a

1 wake-up call.

2 Americans have tended to take for granted
3 leadership in science and technology in education. We
4 have been so good at it for so long that Americans
5 just kind of accepted that.

6 Dan Golden who ran NASA told me a little
7 story when I was mentioning this to him about a
8 meeting he was at, actually a press conference or a
9 public meeting, where one of the people in the
10 audience was criticizing NASA for spending so much
11 money on weather satellites.

12 This person has said to Dan, "Why do we need
13 meteorological satellites when we have the Weather
14 Channel?"

15 (General laughter.)

16 MR. AUGUSTINE: That's a bit of a problem
17 that we face.

18 If we lose on the cost of labor, innovation
19 is the key. How do you innovate? One is you have an
20 environment that promotes innovation. We can talk
21 about that, if you want. However, you also have to
22 have innovators. Innovators to us mean people who are

1 well-informed and well-educated, particularly in
2 science and technology, and that have the funding
3 available to them to pursue their interests.

4 Now, that funding, if it means a funding of
5 basic research, for many reasons that probably will
6 have to come from the Federal Government increasingly.
7 We can talk about that, if you want.

8 However, funding for startup companies to
9 take an idea and put it into being, that funding has
10 always been a great advantage of America. As a matter
11 of fact, California used to have more venture capital
12 available than the second country in the list of
13 countries.

14 The problem has become one that capital
15 follows opportunity at the speed of light. If you
16 talk to investors, they don't care where the
17 opportunity is in the world. It could be in the U.S.;
18 it could be somewhere else; the money will follow it,
19 and very quickly. Last year, for the first time
20 Americans invested more in foreign stock funds than it
21 did in our own stock funds.

22 That brings us back again to the notion of

1 the quality of the people who can create and innovate
2 jobs for the rest of us. The intent was not to create
3 more scientists and engineers because that creates
4 jobs for scientists and engineers.

5 Scientists, engineers, and mathematicians --
6 4 percent of the workforce in the U.S. are comprised
7 of those folks. If you double it, you've got
8 8 percent. So what?

9 The idea is that those who are innovative
10 and qualified in science and engineering should be
11 able to make enormous contributions to creating jobs
12 for others.

13 There are many things that one can think of
14 that should be done. I'm sure you will arrive at many
15 of them in your own deliberations. Our Committee
16 focused on just a couple.

17 I should first offer a caveat. We were
18 chartered by the Federal Government. We did not have
19 in our quiver recommendations having to do with state
20 and local issues. Education, K-12 particularly, is a
21 state and local issue, which makes it a bit of a
22 handicap when you have this limitation. That is one

1 of the problems. We've got 15,000 local school
2 districts in this country, so getting some consensus
3 is a challenge.

4 We focused on what the Federal Government
5 might be able to do. As we looked at the K-12
6 education system from all of our collective eyes, one
7 thing stood out to us -- particularly, as I said, we
8 were focused on science and technology by this
9 point -- and that is, that there is a huge value to
10 having teachers who their primary field of interest
11 resides in science and technology.

12 Today, there is an overwhelming chance --
13 particularly in middle schools, public schools -- that
14 a student studying math will have a teacher who
15 doesn't have a degree or a certificate in math,
16 58 percent in fact.

17 There is a much greater probability that if
18 you are studying the physical sciences in that middle
19 school, that you will have a teacher that doesn't have
20 a degree in the physical sciences nor a certificate.

21 The significance of that to us was that,
22 first of all, the teacher is sort of teaching one page

1 ahead in the textbook when a question is asked that
2 goes beyond the textbook the teacher probably isn't
3 qualified to answer the question. Even more
4 importantly, the teacher doesn't have that excitement
5 about math and science that can make it interesting,
6 that could enthuse children that this is neat stuff.

7 I have a lot of people say to me, "You know,
8 math and science, isn't that boring?" I happen to be
9 an engineer. In my life, I had the chance to play a
10 very, very small part in putting 12 of my friends on
11 the moon and bringing them back. I mean, how good
12 does it get? I mean, what could a person ask for in a
13 career, if that's all you did? There are many other
14 people with stories just like that, that could change
15 lives.

16 We felt that the ability of that teacher to
17 convey the excitement of science and math and its
18 relevance and its applicability is important. If the
19 teacher doesn't have a background in it, if it is a
20 physical education who has been told, "Next semester
21 you've got to teach math," you can't blame them.

22 Some of our schools are obviously very good.

1 On average, they are not very good. The basis for
2 that, of course, is all the international tests
3 they've given, and you're familiar with them, the U.S.
4 comes out in 24th place or 15th place. That's not the
5 place you want to be if you want to be number one in
6 innovation in this future world we're entering.

7 It was our belief that recommendations
8 needed to be brought out that would make possible and
9 encourage people -- whether their primary field is
10 science, engineering, math, or what have you -- to go
11 teach in the public schools in those fields. We made
12 specific recommendations in that regard. I think you
13 probably got out report. If you don't, we will get it
14 for you.

15 Secondly, among other recommendations, we
16 proposed that a commission be established to put
17 together a curriculum of training and teaching in
18 grades K-12 in math and science, and that that
19 curriculum be available on the Internet including
20 standards, measurable standards, that would be
21 available to anybody who wanted to use it.

22 The Federal Government obviously can't

1 overtly force upon local communities, nor should it
2 probably, specific teaching procedures or practices.
3 However, it could certainly make available what is
4 considered to be the best, and local communities could
5 adapt that as they happen to see fit. Those were just
6 a couple of recommendations we made.

7 Let me close, before we turn to the
8 discussion, just by saying what has happened since we
9 turned in our report. As I mentioned, the report was
10 prepared last summer and early fall.

11 We went to the president with it,
12 unfortunately, about two or three weeks before the
13 president's budget and the State of the Union was to
14 be put to bed.

15 We walked in the door and said, "We've got a
16 major problem that people just haven't given enough
17 attention to, and you need to put another \$9 billion
18 in this year's budget and \$19 billion in the
19 succeeding budgets, too."

20 You know, when you do that at the last
21 minute -- I don't go to the White House anymore. It
22 doesn't endear you to them. The fact is, though, that

1 while they didn't put everything in the budget we
2 hoped, they put the majority of what we hoped in it,
3 at least for a first year start with promise of more,
4 hopefully, to come.

5 The president included a number of our
6 points in his State of the Union address. He spent
7 the three days after the State of the Union address
8 going around the country promoting this initiative
9 that the president has named the American
10 Competitiveness Initiative. He still is out. Two
11 weeks ago, he was out for three days talking about it
12 around the country.

13 Within the House and the Senate, the House
14 suddenly had a deluge of bills come in proposing
15 various parts of our proposals. One of the challenges
16 when you deal with these kinds of issues that we're
17 talking about is the issues don't align with the
18 committee structure of the Congress, and so it cuts
19 across a large number of committees.

20 In the Senate, there have been a couple of
21 major bills, one of which basically outlines the
22 20 proposals we made. It had 70 co-sponsors in the

1 Senate, 35 Republicans and 35 Democrats. Whatever
2 success we've had to date has been because this is
3 good for America, not a partisan issue. Hopefully, we
4 can keep it there.

5 Well, with that kind of support, you would
6 probably say, "Well, the money must be just pouring
7 out." It turns out, it doesn't work that way. There
8 is just a lot of hard effort gone in within the
9 White House, the House, the Senate, both parties.

10 However, I think one of the difficulties we
11 face, particularly in the education K-12 area, is that
12 there are so many ideas that it's hard to settle on
13 any one.

14 They are just flooded with different people
15 with proposals, and one of the things that is needed
16 is some congealing on what is it we should do exactly.
17 Hopefully, you can assist in that regard.

18 The other difficulty comes back to a similar
19 problem in the science community where in past years,
20 in my experience, the physicists say, "Yeah, spend
21 more money on research, but don't spend it on
22 chemistry." The chemists say -- you're all familiar

1 with that?

2 This time our recommendation, as I said, was
3 to double in seven years the basic research budget,
4 primarily performed by universities, in the physical
5 sciences, math, and engineering. We also said,
6 though, to continue to support the biosciences to
7 offset the impact of inflation.

8 The biosciences, as you know, underwent a
9 doubling in their budget in five of the last eight
10 years, three years back. In a five-year period, they
11 doubled. The idea is not to let that erode away while
12 you fix the physical sciences whose budget has been
13 stagnant.

14 The problem in the past was you had this
15 divisiveness in the science community, that the people
16 who studied neutrinos didn't want to spend money on
17 photons or what have you. The Congress just threw up
18 its hands and said, "You know, if it's that esoteric,
19 it must not be very important."

20 The one thing I hope that you might be able
21 to do would be to create some kind of a consensus that
22 people can get behind on the specifics of what we

1 could do.

2 I think I have, Leon, just exactly used up
3 my allotted time, and so why don't I stop here and we
4 will turn back to however you want to proceed.

5 ROUNDTABLE DISCUSSION WITH MR. AUGUSTINE

6 CO-CHAIR LEDERMAN: Thank you very much. If
7 you are willing to take questions--?

8 MR. AUGUSTINE: I'll be happy to do that.
9 I'll just do that here.

10 CO-CHAIR LEDERMAN: Okay.

11 CO-CHAIR MALCOLM: Jo Anne.

12 DR. VASQUEZ: Thank you. Oh, thanks so
13 much. It's an honor to have you here as they said
14 before. As we're going into this, what advice would
15 you have on how to engage the public in the
16 conversation?

17 From my vantage point, it has always been
18 how do we change attitudes or parents and school board
19 members, those gatekeepers that are saying, "Well, we
20 don't need any more science because we've got enough."

21 Or, "We don't need to teach primary science
22 because it's not important because we have to teach

1 the children to read."

2 How is it that we go about engaging the
3 public to see that we have to develop the pipeline all
4 along the way in order to have what we need tomorrow
5 to stay competitive?

6 MR. AUGUSTINE: That's a great opening
7 question. You touched on a number of issues that we
8 struggled with. You're all I'm sure aware of the
9 surveys that have recently been conducted that show
10 that some 70 percent of the parents of public school
11 students are very happy with the math and science
12 education that they are getting. There is not the
13 concern that you would have found in our commission
14 anyway.

15 I am also glad you mentioned reading because
16 I hope I adequately qualified it that we were a group
17 of educators, scientists, and from the Institute of
18 Medicine, those three groups and medical
19 practitioners.

20 Our charter didn't include reading. We took
21 that for a given. I think every one of us would agree
22 there is nothing more important than to begin with

1 great skills in reading if you're to have a shot at a
2 good life in America. You certainly can't study math
3 and engineering if you can't read the textbooks, and
4 so I'm glad you mentioned that.

5 What do you do to try to increase the
6 awareness of the public? You mentioned school boards,
7 too. One of the things that we found as we got into
8 our work is that in many countries the school year is
9 a lot longer than the school year in this country.

10 We also found that American students spend
11 40 percent more time watching TV than they spend in
12 class. You all are aware of what has happened to most
13 school boards that have tried to lengthen the school
14 year. The public has a different perception.

15 One of the tasks I think that we
16 collectively face is to change that perception of how
17 we are doing. As people start losing their jobs to
18 well-qualified foreign graduates, then people will
19 become aware of it, but that's too late.

20 Before that what we have tried to do is make
21 ourselves very available to appear on TV, to talk to
22 our people on the radio, editorial boards, we've

1 written a lot of op-eds. I've got a collection of
2 op-eds about that (indicating) thick, not that we
3 wrote but that we triggered -- well, I shouldn't even
4 say we triggered but shortly after our report -- that
5 people, for whatever reason, included in newspapers
6 around the country.

7 As I said, there is not a wakeup call here
8 that is going to be sudden. It's going to take this
9 gradual increase in awareness. Consequently, I think
10 a major part of your work is going to be
11 communicating. It's just hard work. You get out and
12 talk to people, and gradually the awareness seems to
13 come.

14 CO-CHAIR MALCOLM: Mr. Stokes.

15 HON. MR. STOKES: Yes. I was very pleased
16 to hear the very positive type of response that your
17 report and recommendations received from both the
18 administration and the House and Senate.

19 I think ultimately this Commission will also
20 have to consider some phase or facet of how we
21 recommend action in that area and go to the House and
22 Senate as well as the administration to try and follow

1 through with the recommendations that may come from
2 this particular Commission.

3 Now, you mentioned early on in your remarks
4 about a followup group and recommended that we have a
5 followup group pending the release of the report. Do
6 you attribute the response that you got to that setup
7 where you were able to have your group continue
8 working afterwards on this matter?

9 MR. AUGUSTINE: That is really a good
10 question, too. We face a complication I think you
11 also probably face. Your lawyer can tell you.
12 However, being as we work for the National Academy,
13 we're not allowed to lobby. I'm sure you're not
14 either, but that's an engineer's view.

15 You get to the question of: what is the
16 difference between lobbying and informing people of
17 the results of your work? We concluded with advice
18 from counsel that as long as we stayed away from
19 recommending this bill as opposed to that bill, but we
20 went on and said, "This is what our group found, this
21 is what we believe," we did a lot of that.

22 We have been formally disbanded. We don't

1 exist anymore. There is a letter saying we don't
2 exist. You might say it has a downside, but it has a
3 great upside to it, too, because we are all out there
4 as individuals now. I am here today as an individual.
5 I don't represent the academies or anybody else.

6 (General laughter.)

7 MR. AUGUSTINE: I am sharing my views with
8 you and telling you what our commission put in its
9 writing. That gives you a lot of latitude. I think
10 when you are done you need to divide up the Congress
11 and the White House and go see them and then go back
12 and remind them what you told them. It is just a lot
13 of work.

14 The good news is that there is receptivity.
15 There are a lot of things that people care less about
16 than their children. Truly we believe the chances are
17 that our grandchildren and children are going to have
18 a lesser quality of life than we did. If that's
19 right, then that is devastating. There is still time
20 to do something about that.

21 HON. MR. STOKES: Thank you.

22 MR. AUGUSTINE: Great question.

1 HON. MR. STOKES: Thank you.

2 CO-CHAIR MALCOLM: Yes, Karen.

3 DR. SYMMS-GALLAGHER: Did you have a
4 strategy for addressing the K-12 issues with
5 governors, since that is in fact where the authority
6 rests? Were you able to access them or their
7 educational staff or state boards of education?

8 MR. AUGUSTINE: That's also an important
9 question because as you point out it's a state and
10 local issue in many respects particularly when you
11 come to K-12. We have talked to governors in a number
12 of states.

13 Quite a few states have picked up really on
14 their own and are doing their own version of what we
15 did for their state. They have kind of taken the next
16 step for their state.

17 Some of those states, and I'll leave some
18 out, but certainly Illinois, Maryland, California,
19 New York, Florida, Tennessee -- quite a few have moved
20 out aggressively.

21 We have also worked through organizations
22 that we had contacts with: the Business Roundtable,

1 the chamber of commerce, the National Association of
2 Manufacturers, and the Council on Competitiveness.
3 They have kind of come together. That had been a
4 problem in the past, too, that many of them were
5 saying the same things, but we are saying them in
6 different ways.

7 Well, we have kind of come together and we
8 are trying to speak more with one voice now. With all
9 due respect to the educators in the room, when
10 business people go into the government and talk about
11 K-12 as being their highest priority, it has more
12 impact than when educators say that.

13 That's the same as it has more impact when
14 an educator goes in and says they need some new
15 product that some company is building than when the
16 CEO comes in and says they need that new product.
17 There is a certain irony that the less you know about
18 the topic, the more credibility you have. One of
19 Augustine's laws, but it's true.

20 (General laughter.)

21 MR. AUGUSTINE: To the extent you can get
22 others to pick up on your message, I think you will

1 find that will be very helpful. We found also
2 particularly at the local level if we can get the
3 largest employer in the district, the CEO of that
4 largest employer, and get the president of the largest
5 university or college in that district to go in
6 together and say, "We think this is important, and
7 this is what ought to be done," that has a lot of
8 impact.

9 CO-CHAIR MALCOLM: Ron.

10 MR. BULLOCK: Just as a director of the
11 National Association of Manufacturers, we have
12 highlighted the skills gap, really the strategy, for
13 education transitioning to careers.

14 I think, like, 60 percent of the new jobs
15 that will be required in the 21st century, we only
16 have maybe 20 percent of people that will actually
17 have the skills for them.

18 We also have a demographic with the baby
19 boomer generation retiring both in industry and the
20 teaching ranks. There is quite an evolving gap there.
21 I just maybe thought what are your comments or
22 considerations as far as this is a strategy to

1 publicize what we're doing.

2 You know, I should thank you for the
3 followup you all have undertaken because you have
4 contacts throughout the country. The issue you raise
5 of the fact that most of our graduates if we stay on
6 the current path won't be qualified for the jobs that
7 are available is complicated by the long pipeline, the
8 lead times, that's involved.

9 One of the things I probably should have
10 mentioned in my earlier remarks is that based on a lot
11 of anecdotal evidence, we don't have scientific
12 evidence, but fairly convincing to us is that children
13 who are turned off by math and science have been
14 turned off by fourth grade, particularly girls.

15 If their father says, "Math and science
16 isn't for girls," or if the teachers don't like math
17 and science, they're uncomfortable with it, they're
18 not excited, and they can't do neat experiments," then
19 the kids by fourth grade say, "Boy, this isn't for me.
20 It's not relevant. It's hard. I don't like this
21 stuff." You've lost them.

22 By eighth grade, you have to make a

1 decision, if you want to pursue a career in science or
2 engineering. That decision is not that I'm going to
3 do that, but it's that I want to preserve the option
4 to do that.

5 Well, that's different for most careers. My
6 daughter in her senior year in college decided she
7 wanted to be a lawyer, but my son had to decide in the
8 eighth grade he might want to be an engineer.

9 The difference of course is that science and
10 engineering is so hierarchical, the education, that if
11 you skip algebra, you can't start out with calculus.
12 Decisions get made very early if you've got to have a
13 kid turned on in fourth grade so they can make a
14 decision to preserve an option in eighth grade so they
15 can study engineering.

16 The first year of college, like, a third of
17 them drop out along the way and then decide to go on
18 and get a Ph.D. so they can be a researcher, where
19 half drop out. It takes a lot of people in fourth
20 grade and it takes a lot of years before you have
21 another qualified researcher. That is the other
22 devastating part of the problem.

1 CO-CHAIR LEDERMAN: Norm, one of the most
2 admired aspects of your recommendations was that ten
3 thousand teachers and a million minds. That captured
4 the imagination of many.

5 I'm wondering whether your group spent much
6 time looking at, say, the repercussions, the long-term
7 repercussions, of that particular thing where if you
8 make 10,000 excellent new teachers per year drawing
9 from the best students considering careers?

10 Then, they are going to have implications
11 for salaries, and they are going to have implications
12 for how to introduce them into the schools, the actual
13 teaching experiences.

14 We are going to have to avoid the apparent
15 depressing data that the best teachers quit after
16 three or four years. We've got to, then, not waste
17 that investment by fixing that.

18 You have a long-range set of implications of
19 that particular thing, and most of those implications
20 would require additional funding. You are really
21 building up a set of obligations if you want to
22 maintain that advantage.

1 MR. AUGUSTINE: You're right. You are
2 right. Ultimately, I think it would be the view of
3 probably all my colleagues -- I shouldn't put it that
4 way -- I'll say I think it would be their view that
5 we've got to make teaching a much more prestigious
6 profession, which is deserves to be, K-12
7 particularly, and that salaries have got to be
8 competitive with what competent, qualified people can
9 make doing something else, whatever else they might
10 do, if we are to continue to hold these people.

11 Our proposal, particularly the one you refer
12 to, of course was to provide four-year undergraduate
13 scholarships at universities that would have special
14 programs -- really it was four-years-plus, maybe it
15 would be five years -- where you could get a degree in
16 one of the hard sciences or engineering or whatever,
17 math. You would also get a teaching credential.

18 Clearly, you can't just take a great
19 physicist and send them out to teach. They need to
20 learn how to teach to. That is important. However,
21 it is probably easier to do that than the other way
22 around. You need to do both.

1 We had proposed putting money in the budget
2 to get universities to create those kind of programs.
3 There are a few of them out there now. When you start
4 getting these really well-qualified teachers out
5 there, hopefully we can get parents and school boards
6 to wake up, my word, that we've got to draw more of
7 the best and brightest to be teachers.

8 Just a personal anecdote in the case of
9 Maryland, where I happen to live. Just to tell the
10 story, a few years ago when I was running a company
11 here across the river in the state, I went to see the
12 governor because I was very upset about the
13 qualifications of many of the people we were trying to
14 hire that were products of the Maryland schools.

15 The governor finally got frustrated
16 listening to me and said, "Why don't you do something
17 about it?"

18 And so I said, "I will if you will."

19 He said, "Okay."

20 One of the things we did was to create the
21 Maryland Business Roundtable of Education in which we
22 got the CEOs and the heads of law firms and so on from

1 throughout the state to throw in money and hire
2 permanent staff.

3 We strictly were a bully puppet speaking on
4 behalf of business to say that, "Your kids aren't
5 going to have jobs unless you do something about your
6 schools. Pay your teachers adequately. Give them the
7 respect they deserve."

8 We have tried to convey that message. It
9 has been going, I think, for 14 years now and has been
10 reasonably successful. However, others than the
11 teachers have to make that argument. The teachers
12 can't make it.

13 One of the things that group did is a
14 condition for joining the group was that you had to go
15 teach a day in the K-12 system in Maryland. I taught
16 eighth grade math one day and I taught fourth grade
17 science.

18 Just to give you my credentials, I have also
19 taught at a couple of good elements of programs for my
20 four-year-old grandson's preschool class. That is the
21 most terrifying thing I've ever done in my life.

22 (General laughter.)

1 MR. AUGUSTINE: The day I taught that
2 preschool class, I happen to have been giving a
3 lecture at the Kennedy School at Harvard that evening.
4 I mean, I whipped the Kennedy School's lecture out in
5 about an hour. I spent weeks getting ready for this
6 four-year-old preschool class. All of us who went
7 through this experience got a whole new idea of how
8 hard it is to teach. I'll leave it at that
9 (chuckling).

10 You've got to be prepared. It takes the
11 very best. If we don't have some of our very best
12 teaching, it will increase the cost. It will increase
13 the salaries.

14 Today, as you all know, America spends more
15 money per capita on their public school students than
16 any countries except I think it's Switzerland and
17 Liechtenstein, if I'm not mistaken, and our academic
18 performance on average output is among the poorest.
19 Therefore, money is important, but there is more to it
20 than money; it is going to be how we spend it.

21 CO-CHAIR MALCOLM: Let me just raise an
22 issue because I want to push on Leon's point for just

1 a second, and that is, that it isn't just about
2 compensation, although compensation is part of it.
3 Many teachers will leave in the first five years
4 because they have not had an opportunity for an
5 induction process where they are mentored, where they
6 have support, where they are enabled to be introduced
7 to the curriculum, to where they even have a
8 curriculum that is in place and that they are
9 supported in terms of the school, the district, and
10 the profession. There is not a community that they
11 are a part of.

12 We have been working, for example, with the
13 teachers in the District of Columbia Public Schools.
14 I am very happy that some of our teachers actually
15 chose to come this morning and listen to this
16 discussion.

17 However, one of the things that they will
18 tell you is it is also very difficult when they are
19 well prepared, but they have no facilities. They have
20 no laboratories. They have no running water in places
21 where they are supposed to be teaching chemistry.
22 There is a whole kind of an infrastructure.

1 The issue is that anywhere you begin you end
2 up having to embrace the entire system of problems,
3 because otherwise those people are not going to hang
4 with you.

5 We haven't had an investment. We had a
6 federal infusion of resources under NDEA with regard
7 to laboratories and libraries and things like this,
8 but we haven't had that infusion of support since that
9 time.

10 I guess the question is: is there any kind
11 of vision that would include those other enablers of
12 the system so that these well-qualified people will
13 come, but they will stick because they will have the
14 things that they need in order to be successful?

15 MR. AUGUSTINE: Shirley, you mentioned
16 mentoring, and that is an issue that we believe is
17 very important to set up a formal system of mentoring,
18 the support structure for new teachers.

19 We all know the statistics. You cited some
20 of them, Shirley, for people who leave the profession
21 early on. Once you continue to have that kind of loss
22 rate, it is very hard to catch up. Somehow we've got

1 to encourage people to stay.

2 One of our hopes is that these people who we
3 were going to ask the Federal Government to pay their
4 way through college with a commitment to teach for
5 five years, that they will like teaching and decide to
6 stay and become convinced.

7 There are some of you in this room who could
8 make a lot more money doing things other teaching, but
9 thank God you continue to teach. It has to be one of
10 the most rewarding things you can do.

11 It is a different category, but my few years
12 of teaching at Princeton after I finished in industry
13 was clearly one of the most rewarding in my life.
14 Even teachers at Princeton don't get paid like CEOs
15 do, but there is more to it.

16 Pay is part of it. However, as you said,
17 the softer things -- you've got to have water in a
18 chemistry lab for sure. Kids have got to be able to
19 go to school feeling safe. I can go down the list of
20 things that are needed.

21 However, it is a systems problem. As an
22 engineer, we would describe it as a systems problem.

1 To pour out a few good teachers to teach for a year or
2 two and then leave and go to Wall Street, that is not
3 the answer.

4 Similarly, to fix the K-12 system and to
5 produce more researchers, seven or eight or twelve
6 years later but don't have any money in the research
7 budget to perform research, that is not going to solve
8 the problem. It is a systems problem that we think
9 has to do with competitiveness and the creation of
10 jobs.

11 I saw just recently where the president of a
12 large university system in the South said they had
13 fifteen education schools in their system to produce
14 teachers, and last year they produced four teachers of
15 math. That is scary.

16 DR. VASQUEZ: Obviously, it is America's
17 problem, right. As I understand it, the National
18 Academy is going to have another meeting in September
19 as a followup, and they are inviting state people.
20 Could you tell us a little bit more about that?

21 MR. AUGUSTINE: I sure can. I just learned
22 this morning that it may be on the same day as one of

1 your meetings, which is really an unfortunate event if
2 that's true.

3 In any event, the academies are planning to
4 take the next step to try to help coordinate and
5 transfer lessons learned from sort of the federal
6 level that we addressed to the state and local level
7 to do a workshop, if you will, to exchange ideas what
8 can be done at the state and local level.

9 I don't remember the dates. It's in
10 October, is it?

11 DR. STRICKLAND: I was told it was
12 September 27th.

13 MR. AUGUSTINE: September 27th?

14 DR. STRICKLAND: Yes, which overlaps with
15 the National Science Board but not with this
16 Commission.

17 MR. AUGUSTINE: Oh. Is that it?

18 DR. STRICKLAND: Yes.

19 MR. AUGUSTINE: Okay.

20 DR. STRICKLAND: The commission members may
21 be available.

22 MR. AUGUSTINE: That will be held here in

1 Washington. They have got a rather large attendance
2 planned. It will be kind of a working session as I
3 understand it. I hope that you will see fit to join
4 in.

5 CO-CHAIR MALCOLM: Maritza?

6 DR. MACDONALD: I am seeing this as an
7 opportunity. We have been following very much your
8 report at the American Museum of Natural History and
9 coming together with a lot of informal institutions in
10 New York City, with eight of them actually right now,
11 to create the urban advantage, really looking at what
12 is in that eighth grade. That has to do with
13 investigations, that these institutions can come
14 together and help teachers and kids with.

15 We have 111 schools signed up to be working
16 with those schools. The city council allocated monies
17 to put extra resources in the classrooms of those
18 schools and those eighth grades to try to exactly get
19 the kids excited about going to these places, to get
20 some projects in botany at the botanical gardens and
21 go to the Hall of Science -- really, think about all
22 the networking and stuff that's happening -- to come

1 to our place and do the astronomy stuff related to
2 that. We are really hoping that we can do that.

3 However, we still have these boundaries or
4 these gatekeeping mechanisms. If the teachers do
5 those 45 hours of training that they have to do
6 through these institutions in order to be able to use
7 those institutions to teach, even if the institutions
8 made it for free, that they cannot get hours
9 recognized by the school system as professional
10 development hours that count towards their
11 advancement, nor do the colleges count those 48 hours
12 as credits.

13 The teachers are in these quandaries. They
14 are getting a master's, but in order to be able to
15 participate in this eight-consortium process -- it's
16 strict. I hope that maybe here we can figure out a
17 way of talking about it.

18 Teachers need a lot. We cannot create
19 barriers at the colleges, at the boards of education,
20 at the this and that for them to identify where they
21 are going to learn things.

22 It doesn't have to be everything. But six

1 credits? They should be able to take six credits
2 anywhere to do anything that they think is going to
3 get them further.

4 We are in this experiment where we are now
5 arguing who is going to pay for the buses. It's like
6 they get free this; they get \$2,500 for their
7 classrooms; and they get 48 hours of PD. We stretched
8 it. But somebody has to say, "Yeah, I will schedule
9 two buses to take these kids to this place."

10 These are the kinds of things that it has to
11 be, everybody, you know, "It takes a whole village"
12 kind of concept. I think it's to do with the students
13 and the teachers.

14 We are taking all of your recommendations so
15 seriously because we just feel frustrated because we
16 know that there are all these resources in urban
17 settings, but they also are in rural settings.

18 You go to a farm, and you learn stuff. You
19 walk to the river, and you learn stuff. You walk to
20 the park, and you learn stuff. You take the
21 binoculars and watch the moon, and you learn stuff.
22 It is outside the classroom experiences.

1 I don't know how you push all the elements
2 unless we come to an agreement that part of the
3 innovation in education has to be follow the science
4 wherever it is, and then we all do whatever it is to
5 get them there.

6 MR. AUGUSTINE: Well, we heard lots of
7 stories like you describe: two buses, no water in the
8 chem lab and so on. My own impression is that, for
9 example, in teaching science, and again I don't have
10 much experience in that, but that there are kind of
11 two levels.

12 There is one whole huge body of experiments
13 that one can do that are really exciting that you can
14 do for not much money, that a teacher can do in a
15 classroom.

16 For example, when I was teaching my
17 four-year-old grandson's class about space, I just got
18 a long balloon and wrote on the sides of it "rocket"
19 and built a little wood thing so we could launch a
20 balloon and tell them how a rocket works. Sadly, my
21 balloon wound up -- it flew into the broom closet.

22 (General laughter.)

1 DR. MACDONALD: How many weeks of planning?

2 MR. AUGUSTINE: It wasn't well guided. We
3 can strike that from the record.

4 (General laughter.)

5 MR. AUGUSTINE: I think there is that level
6 of things. I can think of a whole bunch of those that
7 I have seen that are just kind of neat. You just have
8 to go do them. It's almost like magic, "How did you
9 do that?" You can explain it.

10 Then, as you say, there are so many assets
11 available outside of the classroom for the bigger
12 things. You can't in every classroom afford to
13 duplicate some of the more expensive things that you
14 need like you can have in a museum. You can take
15 advantage of those things if you are given the
16 opportunity.

17 DR. MACDONALD: And the support and the
18 expectations. I mean, Washington is amazing. You
19 have the Smithsonian and all of these other places. I
20 would love to teach here. However, I would have to
21 have permission to be out of the classroom three days
22 a week.

1 MR. AUGUSTINE: Yes. It's a systems
2 problem.

3 CO-CHAIR MALCOLM: Karen, then Cindy, and
4 Larry.

5 DR. SYMMS-GALLAGHER: I would like to go
6 back a minute and build on, well, the previous
7 comments and some of the things that you are saying
8 about this commitment.

9 There was a study done we finished last fall
10 in California that looked at schools that had the same
11 demographics but very different outcomes, that is,
12 schools that were low performing and schools that were
13 high performing when, in fact, the demographics of the
14 school from English language learners, free and
15 reduced lunch, and so on, were the same.

16 One of the things that the study found was
17 that in high-performing schools all of the adults in
18 the building believed it was their collective
19 responsibility that every child learned.

20 It wasn't enough as a teacher to say, "My
21 kids are doing well. Yours aren't. That's too bad."
22 When it was a collective responsibility for that group

1 of students, they found ways to overcome not enough
2 buses or a teacher down the hall needs something and
3 "That's not my problem, that's hers or his." There
4 were other factors, too, but every one of the
5 high-performing schools sees it as a collective
6 responsibility.

7 I think we do have to talk to parents and we
8 do have to talk to school boards, but that only is a
9 small percentage of Americans, of citizens in this
10 country.

11 There are an awful lot of households that do
12 not have children, an awful lot of individuals who
13 have no daily contact with schools that have to
14 understand how important it is to all of us what goes
15 on in schools.

16 I think we have research and we have other
17 evidence that the future of our country for all of us
18 starts with the collective responsibility we have for
19 all kids learning.

20 One of the things I hope we can come up with
21 is how to take recommendations like your report and
22 make it everybody's responsibility to say "This has to

1 go forward, whether I am personally going to benefit."

2 This is something we all have to believe and get
3 behind.

4 MR. AUGUSTINE: You raised so many points
5 that are really worthy of comment. One of the things
6 that we tried to do, and it was by accident I guess
7 because we didn't come out and start out by saying "We
8 think we should improve the school system because it
9 is fair to our children to do that."

10 We started out saying: "We are interested in
11 the quality of life in America. If you're old and
12 don't have children and grandchildren, somebody is
13 going to have to pay for your medical care. Somebody
14 is going to have to provide the home and security and
15 national security. That means somebody has got to pay
16 taxes. If they are going to pay taxes, they've got to
17 have a job."

18 We went from quality of life to K-12
19 education. If you start with K-12 education, it seems
20 to be a harder case to make. However, if you start
21 out with quality of life for everybody, it doesn't
22 matter whether you're 80 years old and don't have any

1 children or whether you are 28 years old and have
2 5 children, quality of life resonates. I think that
3 is where we've got to be.

4 We went from there, our belief that K-12
5 education was the number one priority, to saying how
6 do you most highly leverage anything you would do.
7 Our conclusion was that the leverage is through
8 teachers.

9 Teachers impact so many people. If you can
10 improve the quality of teaching, you can have such an
11 impact, and that means providing an environment for
12 the teaching not just the teacher his or herself. We
13 can all name four or five teachers who changed our
14 lives. We focused on teaching.

15 Your other comment -- I talked to a
16 gentleman just in the last week who had a program, and
17 we keep discovering new programs I'm sure there are
18 many like us -- but to your idea of the team issue in
19 the schools.

20 They went to an incentive system where I
21 think it was an outside group actually -- as a matter
22 of fact it was, it was a business community who put up

1 money for bonuses for schools. To get over the
2 problem "My class was more handicapped than your
3 class," in terms of learning, they based the bonus on
4 how much your class improved compared to where they
5 were last year.

6 Secondly, it wasn't just my class and your
7 class, it was the whole school. Every teacher in the
8 school got a bonus if the school on average improved
9 in their testing standards from year to year. That is
10 just one idea I heard about recently kind of in line
11 with your question.

12 CO-CHAIR MALCOLM: Cindy?

13 DR. MOSS: I just wanted to add when we're
14 talking about issues with teachers, I'm in Charlotte,
15 and we have over 15,000 teachers. We have an amazing
16 lead teacher content coach program. When new teachers
17 come in, there is a full-time person who meets with
18 them at least once a week, most of the time two to
19 three times a week, to help them do lesson plans, to
20 model a lesson, to deal with any issues, to call
21 parents that they don't know how to handle. I mean,
22 just all those things to help them.

1 When we started it five years ago, we were
2 having a nearly 50 percent attrition rate in the first
3 three years of teaching, and it's down to 20 percent.
4 However, what we've found since then is the reasons
5 our teachers give for leaving, when they leave if we
6 follow up with them and find out, their number one
7 reason they leave is autonomy.

8 They feel like they are not treated with
9 respect. What they do doesn't matter to a lot of
10 people. If they try to get a bus, like Maritza was
11 talking about, nobody will help them with that. Then,
12 number two, discipline problems, three was facilities,
13 four was access to technology, and five was salary.

14 I mean, salary is very important, but what
15 we find from people in education is it is not the
16 number one reason. That autonomy, when we questioned
17 them about it, it comes down to the kind of leader
18 that they work with. The program is across 153
19 schools.

20 I have just been amazed with the kind of
21 people we have in leadership positions. It is not
22 totally their fault. If I look at the classes that

1 they took to be a principal, it was all about the
2 legal issues and managing the buses and the bats and
3 the basketball team. They get very little training in
4 making decisions about instruction and curriculum.
5 They should be reading these reports about how
6 important this is to the quality of our life.

7 I don't know, one of the ways I feel like
8 business can help us is business knows how to train
9 leaders. They know how to prepare them to deal with
10 people. They give them people skills.

11 Our principals just have to take some
12 classes. I mean, some of these people don't like
13 people much less kids. So what are you doing in the
14 schools? Sometimes that is just the reality.

15 (General laughter.)

16 DR. MOSS: We can do all kinds of things to
17 provide better lab facilities and more money for
18 professional development, but as part of the systems
19 approach, we can't leave out educating the leaders.

20 MR. AUGUSTINE: No, leadership is so
21 important to anything you do. I have seen cases in
22 companies where a company was going down hill, a big

1 company, and we did one thing; we changed the leader.
2 That is the only thing we did. It went straight back
3 up.

4 That leader would be the first person to
5 tell you that they didn't do it alone, not by a
6 longshot, but they changed the environment so other
7 people could do their jobs. I have seen just
8 remarkable cases of that, and I'm sure it is true in
9 schools.

10 CO-CHAIR MALCOLM: Yes. There are these
11 people they call "turnaround principals." I mean,
12 essentially, they are kind of SWAT teams, "red teams,"
13 that kind of go from place to place to place turning
14 schools around. It is not that there are bad people
15 inside, but they are just not energized.

16 Larry.

17 MR. PRICHARD: Yes. I was looking at
18 Action A-2, which is to strengthen the skills of
19 250,000 teachers through training and education
20 programs, summer institutes and so forth. As I
21 listened, I'm hearing a lot of barriers to what we're
22 trying to do.

1 I want to know, here, these are very
2 positive issues and very positive things. What is the
3 status of that particular action at this point in
4 time? Is it going to be monitored? Is there money
5 out there?

6 I will give you a real life example. I was
7 fortunate enough to have a real good person in my
8 vocational school who kind of went out like I did with
9 looking for ideas and things to strengthen our
10 programs.

11 We put the Cisco system in; we put drafting
12 in; and we went to a higher level. We named it a
13 career technical center. We did the high expectation
14 issues. Then, it came to a point where we wanted to
15 put in Project Lead the Way, which is a
16 pre-engineering course, a beautiful and wonderful
17 course, but we didn't have the money. We couldn't get
18 it done because of money, simply because we couldn't
19 afford it.

20 Some of our counties in Kentucky have put
21 that in. For instance, Scott County where Toyota has
22 a big manufacturing plant there, they got a grant from

1 Toyota, which is fine. It's again back to the issue
2 of we've got to get it somewhere. You know, that's
3 back to the issue of we don't pay our own way.

4 However, if we look at this just A-2, and if
5 we ignored A-1, which is 10,000 science teachers, and
6 if we went back to A-2 and said, "We'll take 250,000,"
7 and I listened to us talk about middle school teachers
8 not being able to be certified in math and science.

9 I don't know how it was in other places, but
10 when middle school concept came in, in Kentucky, we
11 were K-8. If you think about the structure, and the
12 process was like it could be K-4, 5 to 8, 9 to 12.

13 We would've like to have that sequence but
14 we didn't. We had a K-8, so we moved the 7th and 8th
15 graders out and put the 6th graders with them, and
16 then we had a six-through-eight middle school.

17 What we wound up doing was inheriting a
18 bunch of teachers, a lot of teachers, who were
19 teaching in sixth, seventh, and eighth under the
20 certification that they had already provided for them.
21 It was already there.

22 Now, we are saying to them, "We need to

1 retool." Had we have had this in front of us at that
2 time, now we would have said to them, "Not only are we
3 not going to pay you the wage you deserve, we're going
4 to ask you to pay \$400 an hour and go back to school
5 and retool."

6 Which is what? The answer is "No, I'm not
7 going to do that because, number one, I don't have to.
8 Right? Because I'm still a teacher, and I have taught
9 this class for years and years and years."

10 Then, No Child Left Behind comes along and
11 says, "If you're going to have highly qualified
12 teachers, this is what they are going to have to do to
13 do that."

14 By the way, I don't know about most
15 superintendents, but this superintendent cussed No
16 Child Left Behind until a fly wouldn't light on it
17 because it tried to say to us that we had to do it and
18 do it fast. It was just too hard and too fast.

19 However, it does have some good components,
20 and this is one of the good components, that it says
21 we have to measure up to this particular issue. I
22 think we do.

1 Now, my question is, in the interest of time
2 after I've said all that, what is the status of A-2?

3 MR. AUGUSTINE: Well, your points are good
4 ones. To your specific question first, the status of
5 A-2, I should probably say as a preface that it was
6 our committee's belief that of all the recommendations
7 we made, and we made recommendations from tax policy
8 to patent policy to visa policy to basic research
9 funding to K-12 education and so on down the line, we
10 thought the one that would catch fire and would be the
11 easiest to sell would be the K-12.

12 People care about children. We all have
13 children -- well, most of us have children and
14 grandchildren. In terms of the initial reaction,
15 where does it stand, that got a lot of the headlines
16 to start out with. As time has gone on, we have
17 discovered that has been the hardest one of the group.

18 For example, getting the research doubled
19 has turned out to be a lot easier than getting the
20 K-12 money, which it was a surprise at least to me and
21 I think to my colleagues.

22 I have asked myself why that is. My

1 conclusion, it goes back to some of my earlier
2 remarks, is that the science community has kind of
3 finally got itself together to where the biological
4 scientists are blasting the physical science for
5 getting an increase in research funding.

6 There has been kind of a belief that it is
7 important to fund research, and we will worry about
8 later how we allocate it. Hopefully, sensibly that
9 will be done.

10 Whereas, in the education when there are so
11 many ideas, conflicting ideas, "You should spend here
12 money, here and there," that the Congress is just
13 overwhelmed.

14 There are others in the room who could
15 answer this better than I, Nancy being one. However,
16 I think to get something done there you sort of have
17 to come in with some specific things to do.

18 To double the research budget, even though
19 it costs a lot of money, they can understand it. I
20 don't mean that in a demeaning fashion. I'll bet I
21 heard 300 neat ideas on what we could do to fix our
22 schools, but what we need to do is to pick about five

1 of them.

2 The other issue that I believe that we all
3 have a responsibility to deal with is to try to convey
4 the importance of this problem that we face in this
5 country, to get more awareness of it. We can afford
6 to put water in the classroom, to have two school
7 buses, to do the things in the recommendation (a)(2).

8 You may be aware that Americans last year
9 gambled \$7 billion on the Super Bowl. You can buy a
10 lot of school buses for \$7 billion. We spent
11 \$32 billion last year on videotapes of movies and
12 going to the movies. If educating our kids isn't more
13 important than that, then we deserve what we're going
14 to get. End of emotional speech.

15 (General laughter.)

16 CO-CHAIR MALCOLM: That's okay. We have a
17 lot of passion in this room.

18 Leon?

19 CO-CHAIR LEDERMAN: Let's see, I wonder
20 whether you have advice for us. We are going to work
21 hard for the next year or whatever, and we are going
22 to have recommendations. All of us are sort of

1 terrified because we are aware of the large number of
2 reports that have been written over the last 25 years
3 with recommendations. So many of them are proudly
4 sitting on shelves around the government and nothing
5 has happened with them.

6 You have the magic somehow that your
7 recommendations suddenly appeared in the State of the
8 Union message and congressmen are fighting with each
9 other to sponsor your legislation. We need your
10 advice. How do we achieve the kind of recognition of
11 the validity of our recommendations?

12 MR. AUGUSTINE: Well, Leon, I've contributed
13 to whole shelves of those things that are sitting back
14 there that nobody has read.

15 (General laughter.)

16 MR. AUGUSTINE: A couple of them I
17 contributed to had important recommendations. The one
18 that comes to me is the Hart-Rudman Commission that
19 you may be familiar with that I served on. We had two
20 recommendations. We were investigating national
21 security.

22 The first was to warn that something like

1 9/11 was going to happen. We didn't say that
2 specifically, but we made very clear that we've got to
3 get ready to lose tens of thousands of people in this
4 country to terrorist actions on U.S. soil for the
5 first time. We said that in those words. The second
6 one was to fix K-12.

7 That report was totally disregarded until
8 9/11, and then they picked up on the first part on
9 9/12. I have struggled with this question of why did
10 this catch on and most of the other stuff I'd done in
11 my life didn't.

12 Leon, the only thing I can suggest, one, was
13 people are getting worried about their jobs. We
14 connected the story not to education but to jobs.
15 Secondly, during the time we were doing our work --
16 you've got a whole year -- we started laying the
17 groundwork.

18 Every couple of months, we would make the
19 circuit through the White House and on the Hill to the
20 key members, tell them what we were doing and where we
21 stood, just to keep them informed. When the report
22 came out, they were kind of primed; they knew

1 something was happening.

2 We also built up some internal support
3 within the government. We worked with the departments
4 very closely. The issues we dealt with kind of
5 crossed defense, energy, education, and transportation
6 -- who am I leaving out -- but many of the departments
7 we worked with.

8 Then, when you have finished your report,
9 get out and get as much attention as you can. Spread
10 out and talk to people on the Hill. Get on every TV
11 program you can. It is just a marketing job is what
12 it is. It is a marketing job.

13 It has gotten harder in K-12 because,
14 unfortunately, a lot of the parents who would have
15 been the movers and shakers in the public schools have
16 given up and moved their kids to private schools.
17 You've got a smaller audience. You've got to somehow
18 get those people back to where they care about schools
19 as a whole, not just they say, "Well, I've solved my
20 problem."

21 We found when you coupled it to jobs, we
22 found it wasn't too hard to get on TV to try to convey

1 your message.

2 I was on Charlie Rose talking about our
3 report. I thought I had done a pretty good job. The
4 next day my seven-year-old granddaughter said she had
5 seen me on TV. I said, "Oh, really, that's nice."

6 And she said, "Were you embarrassed?"
7 That's the only feedback I've had.

8 (General laughter.)

9 MR. AUGUSTINE: I'm still trying to figure
10 out what she meant.

11 CO-CHAIR MALCOLM: You probably don't want
12 to know.

13 MR. AUGUSTINE: I think you're probably
14 right (chuckling).

15 CO-CHAIR MALCOLM: Let me just give you the
16 lineup right now so that you know that I have seen
17 you. Anybody who hasn't been seen will know to get on
18 the list.

19 I'm going to go out of order and take
20 Elizabeth. Because as chair of the Education and
21 Human Resources Committee of the Board, she has an
22 opportunity to follow up on some things inside of the

1 Foundation, and that is important. Then, after that
2 Maria Alicia, Tim, and Jim. Anybody else, okay, on
3 the list?

4 (No verbal response.)

5 MR. AUGUSTINE: Shirley, can I add a
6 footnote to the last question out of order? Am I
7 allowed to do that?

8 CO-CHAIR MALCOLM: Yes.

9 MR. AUGUSTINE: One other thing that is
10 important is to get somebody else to carry your water,
11 somebody who doesn't have a conflict of interest, if
12 you will.

13 DR. HOFFMAN: Well, thank you, Shirley.
14 I've been very quiet. As people on the Board know,
15 that's very hard for me, to be very quiet (chuckling),
16 but I have.

17 I don't want us to lose sight of what I
18 think is very important and what I thought was
19 extremely important in "Rising Above the Gathering
20 Storm." It was prompted by something that Cindy said.

21 I don't want this to be a criticism, because
22 I've seen many, many reports of teachers themselves,

1 who don't report that pay is the most important thing.
2 Therefore, I respect that from the people who have
3 already chosen to be teachers. Certainly, the lack of
4 respect is horrible and the lack of respect adds to
5 the lack of compensation.

6 What I am concerned about and which I think
7 your report addresses, which is that we are not
8 recruiting to teaching the best people in science and
9 math especially. I think North Carolina is a perfect
10 example when you are only preparing, what is it four
11 math teachers and three physics teachers, in one year.

12 DR. MOSS: No, that's in four years.

13 DR. HOFFMAN: Four years? I'm sorry, four
14 years. I thought it was only one year, that's bad
15 enough. It speaks to the fact that people with those
16 aptitudes are not even choosing to go into teaching.

17 They are not choosing to go into teaching
18 for many reasons. However, two of them have to be
19 lack of compensation relative to what they could earn
20 in other things that require the same skills and lack
21 of respect for the work that they do relative to what
22 they could get in other things that they could do. I

1 want to be sure that we don't lose sight of that.

2 The figures you gave about gambling on the
3 Super Bowl, I mean, if we can spend that much money on
4 the Super Bowl, why can't we pay our teachers enough
5 to recruit people who are skilled at science and
6 mathematics into teaching? Why can't we have buses
7 and water (chuckling)? I mean, I just want to be sure
8 we keep that on the table. That is one of the things
9 you address somewhat indirectly in a way.

10 The Federal Government can't pay teachers
11 more. That has to come from the states and the local
12 authorities. However, what the Federal Government can
13 do is provide the loan forgiveness, provide the means
14 to make it less costly to become a teacher, which is
15 sort of the flip side of paying more.

16 MR. AUGUSTINE: It is a question of
17 priorities, I think. We need put higher priority on
18 the education of our children. We have just got to
19 make it an issue of priorities. If we choose to not
20 put emphasis, we would rather spend the money on the
21 Super Bowl, that is a choice that we can make as a
22 nation I suppose. It is probably not a very good

1 choice. Somehow we have got to get that out there,
2 that you are making choices. Enough said.

3 CO-CHAIR MALCOLM: Maria Alicia.

4 DR. LOPEZ-FREEMAN: I'll try to be quick.

5 (General laughter.)

6 DR. LOPEZ-FREEMAN: Thank you.

7 I would like to follow up actually on
8 Elizabeth's comments. I am at the University of
9 California where systemwide we have started the
10 science math initiative, which is actually a direct
11 result of A-1.

12 However, this is the university whose output
13 of teachers is limited. We don't produce the teachers
14 in our state. It is a state university. How is it
15 that we can get more of the university academic
16 departments, and I'm really talking about college of
17 arts and sciences because that is where we have housed
18 our initiative, so that as freshman faculty in
19 chemistry and physics are telling majors "Consider
20 teaching as a possible career choice"?

21 We know there will be many students that
22 will pursue degrees and at the end of four years

1 decide that doctoral programs are not what they want,
2 or going into industry is not there.

3 How do we position? How many colleges
4 across the country are actually taking serious the
5 fact that education careers could be something that is
6 viable for their math and science and engineering
7 majors?

8 I don't know what others are doing. I know
9 we as a system last year have started this initiative
10 and are hoping to produce the thousand teachers that
11 we promised our governor. Actually in conjunction
12 with the governor, we have made that promise.

13 MR. AUGUSTINE: Well, California is
14 certainly one of the states that has moved out, along
15 with some of the others I mentioned, to do something.
16 Your program I think is a terrific program.

17 The challenge I suppose here is that we are
18 dealing with a societal issue that deals with things
19 like images and prestige. You know, it is one thing
20 to give teachers a raise. That probably is a
21 necessary but not sufficient condition to solve the
22 problems we have addressed.

1 On a humorous note, when I was working on
2 this report I got a note or an email from
3 George Heilmeyer. George used to run the Defense
4 Advanced Research Projects Agency and then he ran
5 Lucent, I guess. He said that when he went to Russia
6 he always loved to go to the movies there, because in
7 the Russian movies the engineer always gets the girl.

8 (General laughter.)

9 MR. AUGUSTINE: It is kind of a facetious
10 way of making two points. One point being that image
11 and respect, and so on, is an important part of this
12 issue. You don't change that by legislation.

13 The second is that one of the problems is
14 that half of the engineers are not girls. They should
15 be, and they should get the guy, if you will. Twenty
16 percent of the population, the college population, of
17 women study engineering. Did I say that right? I
18 didn't come close to saying that right. Twenty
19 percent of those who study engineering are women.

20 If we throw away 30 percent of the talent in
21 the country, you are just handicapping yourself. We
22 can't continue to do that. It is a societal issue.

1 It goes all the way back to the father who tells the
2 daughter "Don't study math, girls don't do math," to
3 the high school counselor who says "Why don't you get
4 a job on Wall Street and study business." It's
5 unfortunate that we should do that.

6 CO-CHAIR MALCOLM: Okay. Tim.

7 MR. MCCOLLUM: Thank you. Mr. Augustine, we
8 have been talking a lot about the systems and problems
9 within the system. You also made reference to the
10 fact that we have a growing issue with teachers,
11 particularly in the middle school, that may not be
12 certified in the area of math or science.

13 I would like to suggest that there is a flip
14 side to that same problem. As more and more
15 traditional junior highs have made the move to the
16 middle school, and there have been many, many great
17 things have come from that, one of the issues that we
18 are seeing surface is that rather than not having
19 highly qualified math and science teachers in the
20 classroom, in many cases we have some very highly
21 qualified math and science teachers who have a very
22 strong passion for what they do.

1 However, due to staff shortages and due to
2 the fact that a middle school does cost more to
3 operate than a traditional junior high, they are being
4 assigned to teach classes more frequently outside of
5 their subject area. Now, this might be social
6 studies; it might be language arts; it could be
7 English classes or reading classes.

8 In many cases, they really do not have the
9 preparation for this. We are finding that they are
10 spending in many cases more preparation time preparing
11 for these other classes than for the actual math and
12 science class that they have been primarily assigned
13 to teach. It is a growing issue.

14 I would ask the Commission to really -- and
15 I would like to speak for the math and science
16 teachers across the country -- please let us focus on
17 the topic that we have the passion for and that we are
18 trained for. For the math teachers, please let us do
19 the same thing.

20 MR. AUGUSTINE: That is really interesting.
21 I hadn't heard that was an issue. Well, as you said,
22 it is just the flip side of the problem that we

1 addressed. I don't know, we wouldn't expect a heart
2 surgeon to do brain surgery, but we seem to expect a
3 math teacher to teach European literature.

4 MR. MCCOLLUM: Exactly.

5 CO-CHAIR MALCOLM: Norm, I understand that
6 we are at the time that we asked you, but if you could
7 just hang on for five minutes, it will be good.

8 MR. AUGUSTINE: I can do that.

9 CO-CHAIR MALCOLM: Okay.

10 Jim, quick.

11 DR. GENTILE: Real quick. I'll start off by
12 mentioning something I know nothing about, and that is
13 dark energy. What fascinates me about dark energy is
14 that it is, roughly, 80 percent of the universe. We
15 don't know what it is; we don't know why it is; we
16 don't know where it is; and we don't even know if it
17 is, if I'm right.

18 There is only 5 percent that we can look a
19 past the light, and then we've got this dark matter.
20 Maybe that is the problem we are facing is the dark
21 energy matter in this whole system.

22 Then, I take a look at what is happening in

1 our academic communities. I take a look at what is
2 the dark energy. If you just assume science majors in
3 a university or a college, well, the dark energy is
4 the life sciences.

5 Everyone else is squabbling over the
6 20 percent. All the engineering and everything else
7 is really cut out of that other 20 percent. However,
8 then you look at the dark energy or what's happening
9 at colleges and universities.

10 You only have about 20 percent who are
11 science majors and all the rest are people who are
12 going to be very literature but maybe not very
13 scientifically literate, if we don't think about it.
14 Yet, that is the pool oftentimes that is the deepest
15 pool where we might be able to recruit teachers and
16 educators for the future.

17 However, then we really look at this dark
18 energy of what's happening in the population at large,
19 and that is all of the individuals who don't progress
20 beyond high school or perhaps maybe not even through
21 high school. That is a whole other dark energy that
22 we have to address because that is a group we have to

1 convince as to what is happening.

2 The other thing, Mr. Augustine, that you
3 said that really hit me hard was it's a systems
4 problem. I think it really is. However, I'm not
5 thinking about the school systems, but I'm thinking
6 about it's a problem in systems. As we envision it,
7 it is a problem in leadership.

8 We have many, many good men and many, many
9 good women who are fighting the tyranny of the urgent,
10 and they are also fighting the tyranny of the new idea
11 and being asked to do both at the same time. That is
12 why we don't have those school buses, and that is why
13 we don't do a lot of the stuff.

14 I think we have to think not just on the
15 unique programs that work or the five or six or seven
16 or ten things that are going to work, but we have to
17 think a little more in a systems approach. Because I
18 really think that is perhaps where we can find the
19 superheroes that it is going to take to pull this off.

20 CO-CHAIR MALCOLM: Okay. Ron, one last
21 comment?

22 MR. BULLOCK: As you are saying that, I just

1 lost my engineering manager who is going back to be a
2 high school physics teacher. He is getting certified
3 over the summer. He will be teaching in the
4 classroom, and the State of Illinois is paying for
5 that.

6 I would second that I think we've got a
7 whole group of adult learners. I thought I was the
8 manufacturer, but I'm really in the education
9 business. Industry as a whole spends \$60 million to
10 \$80 million, maybe a little less than we wager on the
11 Super Bowl, on training every year. Part of that is
12 remedial, things that kids should have learned in high
13 school.

14 If we can get an improved product coming out
15 of the school system, that frees up more capital for
16 us to innovate as businesses, which is really the key
17 to our success as companies and as a society.

18 A lot of the things that plague us right
19 now, like global warming, are going to be solved
20 through technology. It is tremendously exciting if we
21 can get that message across to young people that are
22 just starting out and teach them how to become

1 innovators really when they are young.

2 As the grandfather of five grandchildren
3 aging in range from two years old to seven years old,
4 they are so creative when they are young and somehow
5 as a society we dampen that enthusiasm. I think we've
6 got some great opportunities.

7 Certainly, we have Dr. Boggs who heads up
8 the community college association, who isn't here with
9 us today, but we need to keep the community colleges
10 involved as well, and tap into the adult learning
11 community as well.

12 CO-CHAIR MALCOLM: Okay. Thank you.

13 MR. AUGUSTINE: We thought the kind of
14 issues you've raised, there are sort of two levels.
15 One level is we are entering a world where, as you
16 said, many of the problems and challenges we face have
17 science and technology deep at their roots -- whether
18 it is energy, healthcare, national security, homeland
19 security, or the environment, and you can go down the
20 list -- science and technology are going to be
21 important.

22 Every citizen that is going to survive and

1 compete and have a job in this world is going to have
2 to be at least familiar with these issues at a basic
3 level.

4 Then, there is this other level where there
5 is this much smaller group of just really highly
6 qualified people who can make the basic discoveries
7 that create jobs for everybody else.

8 We've somehow got to find a way to address
9 both of those issues. Again, it is a systems problem
10 to do it. I think if we can do that, we will have
11 resolved a lot of the problems that we face today.

12 Shirley, thank you for the invitation.
13 Thank you for what you're doing.

14 CO-CHAIR MALCOLM: Thank you so very much.
15 We really appreciate your coming to us.

16 (Applause.)

17 CO-CHAIR MALCOLM: We have a coffee break.
18 Yes, let's reconvene at 10:25.

19 (Recess taken.)

20 SESSION IV

21 CO-CHAIR MALCOLM: Thank you for getting
22 back. Let me just say that we all really appreciated

1 and benefitted from Norm Augustine's presentation not
2 only on the report content, which we had been able to
3 preview, but also on his advice to us about how to go
4 forward. We really need to look at that.

5 In this particular phase of the meeting, we
6 are going to focus on our work plan. Jo Anne,
7 Dr. Vasquez, is going to moderate this particular
8 session.

9 Let's remember our charge, the charge that
10 we have. Let's remember some of the elements that we
11 have already discussed with regard to the work plan.
12 This is also the time if we see things, if there were
13 things that emerged from his comment that have not
14 appeared in the work plan, this is the time to
15 identify those as well. Not only do we have to look
16 at what we have but what we don't have that we might
17 need.

18 Jo Anne.

19 WORK PLAN DISCUSSION

20 DR. VASQUEZ: All right. Thank you very
21 much.

22 I will move to the front of the room there

1 in just a moment. One of the things that we need to
2 keep in mind is if you look at the last page under our
3 charge and our agenda there, the objective of the
4 Commission once again is "Effective, realistic,
5 affordable, and politically acceptable, and long-term
6 solution."

7 I think after hearing Mr. Augustine speak I
8 truly believe that we can build off of a lot of the
9 good things that have gone before us, a lot of the
10 work, standing on these giants. I think the things
11 that he is saying about the public relations, all of
12 us have the ability to go out there and talk.

13 There is a lot of work to be done. The time
14 line you saw yesterday, of course we will reiterate
15 that again. However, what I would like to do for the
16 next few moments is I would like us to go back to look
17 at the potential working groups as you have had a
18 chance to reflect on them. I'm going to show those up
19 there.

20 Where did our tech guy go? Could somebody
21 start the slides, please?

22 (PowerPoint presentation in progress.)

1 DR. VASQUEZ: Several conversations I think,
2 as I mentioned yesterday, all of this, of course one
3 of our outcomes is to give guidance to the National
4 Science Foundation. However, we also have a bigger
5 charge in that we have the guidance then to,
6 hopefully, build off and give guidance to Congress and
7 to the nation.

8 Therefore, as we look at that, we are
9 including number seven so that there are seven groups.
10 If you look at the last page there, we have those that
11 are cross-cutting across those.

12 Now, that is not saying that each of these
13 are just within themselves a certain silo or a
14 bucket, as was talked about yesterday; however, as
15 Shirley keeps reminding us, it is the system that will
16 be affected.

17 Of course, as we look at the sub-bullets
18 under each one of those, what I would like to do is
19 take each one and to look at those closely and see if
20 you want to add anything to that list that you feel
21 might be included within the working groups' charge.

22 Let's take the first one. If you will, take

1 just a moment and read through those, and then we will
2 have a recorder up there if we want to add anything
3 more to this.

4 (Pause in the proceedings.)

5 CO-CHAIR MALCOLM: Jo Anne, it might be
6 useful, for the sake of the audience, to mention what
7 the cross-cutting themes happen to be, because I think
8 there are going to be people who don't see things that
9 they expect to see. We haven't let them know that
10 there are some of the issues that basically everybody
11 has to deal with.

12 DR. VASQUEZ: Certainly. Thank you,
13 Shirley, for the preview of the audience and also to
14 remind the Commission itself what we thought as we
15 were brainstorming some of these and asking people
16 under the subcategories.

17 Of course, English language learners, a huge
18 concern that cuts across the whole seven topics that
19 we have chosen. Special populations: rural, inner
20 city, urban, suburban, all of these areas, special
21 populations. Of course, there is the special needs of
22 special-needs students.

1 Use of technology, how does it affect the
2 system that you are looking at the working group?
3 Underrepresented populations: minorities; students
4 with disabilities; gender issues, including
5 underperformance of certain populations of minority
6 males.

7 Another one would be the role of the Federal
8 Government and the linkage between education and NSF.
9 What is the role of science- and technology-based
10 industries and agencies, looking at effective
11 practices and how those effective practices are
12 pinpointed into each one of these? What does research
13 tell us about learning sciences, organizational
14 change, et cetera, and about systems?

15 We have that cross-cutting between all of
16 those that is going to help inform our work. Instead
17 of teasing each of those out, we would be able to put
18 those within the context of what we are doing.

19 Yes, Leo?

20 CO-CHAIR LEDERMAN: Well, first of all,
21 there are repetitions. I don't know whether they are
22 there on purpose. For example, "ongoing professional

1 development" appears in the same words in item two.

2 DR. VASQUEZ: Yes.

3 CO-CHAIR LEDERMAN: Is there a reason for
4 that?

5 CO-CHAIR MALCOLM: Yes.

6 CO-CHAIR LEDERMAN: You want different
7 attitudes towards that?

8 CO-CHAIR MALCOLM: The idea is while you say
9 "teachers" on the first one, for example, they are not
10 necessarily the people who can make sure that you get
11 the ongoing professional development. You've got
12 administrators and principals and then you have higher
13 education, I mean, so everyone who has to own it has
14 to deal with it.

15 CO-CHAIR LEDERMAN: I mean, one of the
16 things which was already been mentioned several times,
17 clearly, salaries are an important issue in the
18 teacher column.

19 Another important issue in the teacher
20 column is prestige or social status, and that falls
21 under the general heading of the propaganda, you know,
22 under what I call the "Oprah Winfrey column."

1 How do we raise the level so that kids will
2 say or parents will say, "Gee, I wonder if my kid
3 could become a teacher," rather than, "Teacher, oh,
4 they can do better than that."

5 DR. VASQUEZ: Well, I'll open that to the
6 group. I think the public outreach of what we're
7 doing is sort of everything. However, as far as
8 salary, if you look at the seven points, as far as
9 that being able to affect the system, salary would
10 probably in my recommendation be it would come under
11 key to improve STEM education, which begins with
12 effective teachers.

13 If you would like to, we could certainly
14 include that in there. I mean, looking at the
15 salaries of teachers is key to how we get that
16 transition from someone who is in industry going into
17 teaching or thinking of that as a maybe a second
18 career or, hopefully, a first career. I don't know.

19 Karen.

20 DR. SYMMS-GALLAGHER: Well, I'm wondering if
21 you couldn't call it "working conditions" because part
22 of it is facilities, part of it is access to

1 materials, and part of it is access to it could be
2 salary and other conditions of employment.

3 I don't know that I would call it a key. I
4 don't know if that heading is exactly where I would
5 put it. However, given what we have there, I think
6 working conditions and then salaries could go as part
7 of that.

8 DR. VASQUEZ: Excellent. Okay, does
9 everybody concur on that?

10 Karen.

11 DR. SYMMS-GALLAGHER: Well, I have another
12 couple of suggestions. Under the "standards for
13 highly qualified teachers," I would put as we have in
14 some of the others, "licensing standards" as one of
15 them and then the other are things like "No Child Left
16 Behind." It had who highly qualified teachers are,
17 and it has, in fact, modified some of the state
18 standards on licensing. I think we have to look at
19 both of them.

20 DR. VASQUEZ: Okay.

21 DR. SYMMS-GALLAGHER: The other is to
22 clarify what "nontraditional teacher inputs," I would

1 put "alternative routes into teaching" because that is
2 really what we are talking about. Obviously, it
3 continues to be that teachers come through the
4 traditional route of higher ed, but there are many,
5 many alternate routes and we should make sure that we
6 know what those are.

7 DR. VASQUEZ: Any other additions or
8 modifications to some of the bullets? Now, it doesn't
9 mean that whoever chairs this or the two people who
10 chair this that your constraints are within that, but
11 at least this is a guiding point to start as you begin
12 to form your working groups.

13 DR. LOPEZ-FREEMAN: Jo Anne?

14 DR. VASQUEZ: Yes.

15 DR. LOPEZ-FREEMAN: Also, I'm not too sure
16 if it's under "sustained professional development,"
17 but to highlight the issue of induction and mentoring,
18 so induction, mentoring, and coaching.

19 DR. VASQUEZ: Okay. Good. Good point.
20 See, that's why we have you all bringing different
21 perspectives, all right. Excellent. Anything else on
22 number one?

1 (No verbal response.)

2 DR. VASQUEZ: Well, if you happen to think
3 of something, we can always go back and add to the
4 list.

5 All right, does that satisfy you, Leon, as
6 far as salaries? If we put that under "working
7 conditions," does that work?

8 CO-CHAIR LEDERMAN: Sure, yes.

9 DR. VASQUEZ: All right. Excellent. All
10 right, number, two: "Environment infrastructure that
11 supports reform." Take a moment and look those over.

12 (Pause in the proceedings.)

13 DR. VASQUEZ: Anything that you can think of
14 to add that list at the moment?

15 DR. LOPEZ-FREEMAN: Jo Anne, I'm sure that
16 not every state has this issue, but anything that
17 would have to do with unions or collective bargaining
18 issues, would come maybe into the "environment and
19 infrastructure."

20 DR. VASQUEZ: Excellent point because there
21 are many states that are wrestling with that,
22 particularly with professional development time.

1 CO-CHAIR LEDERMAN: Well, I don't know the
2 comment, where it goes, but it would be good to know
3 whether the most recent research or reasonably
4 accepted research results in the neurosciences in
5 cognitive psychology and so on reach the classroom.
6 Where is that?

7 DR. MOSS: I can answer that right now.

8 (General laughter.)

9 CO-CHAIR MALCOLM: No, we can answer that
10 right now.

11 CO-CHAIR LEDERMAN: They don't.

12 (General laughter.)

13 DR. VASQUEZ: I think that may come under
14 number three, when you look at STEM curriculum. I
15 think the latest neuro- and cognitive research, I
16 believe, would come under there.

17 Yes?

18 DR. MACDONALD: Wouldn't we put it in the
19 kinds of ongoing professional development in science
20 and math that we should put recent research? Because,
21 you know, it's not just professional development as
22 usual. That is where you get into the cutting-edge

1 science to be able to reform and change it. Yes, I
2 was thinking of this "ongoing professional
3 development" as may not be as explicit as the
4 neurosciences, but that it is "current research."

5 DR. VASQUEZ: Well, we would hope that that
6 would be implicit in there, but it might be nice to
7 notate that as well.

8 DR. MACDONALD: I think I would push for the
9 "current research," because that is what is going to
10 make anything different.

11 DR. VASQUEZ: Okay. Anybody else?

12 Yes?

13 DR. GENTILE: I think that as far as
14 environment, I can see the undergraduate sector in
15 colleges and universities as being really crucial to
16 environment and infrastructure, but they are also
17 going to crucial later on when you get to curriculum.

18 However, I think the philosophical approach
19 that occurs at the universities and the colleges has
20 to be supportive and environmentally affirming of
21 these kinds of issues because they are going to play a
22 role perhaps in many of these. How does the college

1 and university play a role in sustaining, supporting,
2 and advancing this?

3 DR. VASQUEZ: Good.

4 Has our scribe got that down?

5 THE SCRIBE: (Moving head up and down.)

6 DR. LOPEZ-FREEMAN: I don't know where this
7 goes, but the whole issue in the environment of time,
8 the allocation of time, and the tension that is
9 created in time allocations when it comes down to
10 prioritizing language arts, reading per se really,
11 plus pedagogical approaches that sometimes produce a
12 dissonance with teachers in terms of the teaching of
13 science, direct instruction versus direct experience
14 with phenomena.

15 I think that is part of the environment and
16 infrastructure that supports. It is not really
17 apparent in any of those categories that it is coming
18 up, but I think it's there.

19 DR. VASQUEZ: Well, I think you're right.
20 It actually can go in two categories quite well:
21 policies that support reform, because this gets back
22 to your administrators or whoever saying, "You have

1 20 minutes twice a week, but that's all you get to
2 teach science in elementary, et cetera, or no
3 science."

4 However, it also comes under number six,
5 too, as well also, yes, because the stakeholders have
6 to be aware that it takes time to have a direct
7 exposure to materials, et cetera. Maybe we could put
8 "policies that support reform," and then under that
9 maybe just "i.e., time for science."

10 DR. LOPEZ-FREEMAN: Distribution of time in
11 that environment as guided by priorities.

12 DR. VASQUEZ: Yes. Once again, this
13 90 minutes, and Cindy can speak to that, or 60 minutes
14 or 65 minutes or whatever it is for a class in high
15 school to get them in and get them down.

16 Okay. Anybody else?

17 Karen?

18 DR. SYMMS-GALLAGHER: Well, also policies
19 that support reform. We need to also recognize it's
20 at the state level, too. That is both for public
21 higher ed and for K-12. Then, in many cases, you have
22 some conflicts of multiple policies passed at the

1 state that all have worthwhile goals but all require
2 often conflicting or impossible things to meet at the
3 same time in the classroom.

4 DR. VASQUEZ: Would this be where you might
5 want to also highlight some states that are now
6 starting to do maybe some innovative kinds of things,
7 that the state level is affecting the district-level
8 policy? That might also be something under number
9 two. Good.

10 CO-CHAIR MALCOLM: I want to raise one
11 question, and that is the point that Mr. Augustine
12 raised about time as in a different form, which is
13 basically length of school year. Maybe a better way
14 to put that is really the length of vacation.

15 The research suggests that it is the amount
16 of time not in school that is really the problem with
17 regard to summer loss and other kinds of issues. This
18 time view differently is not how the week is parsed
19 out or the day is parsed out, but essentially there is
20 research which says or would suggest that the way that
21 we think about the amount of time that is needed for
22 instruction on a longer time frame is problematic.

1 DR. VASQUEZ: All right. Boy, you want to
2 push a hot button on that one.

3 CO-CHAIR MALCOLM: Hmm? Yes, yes.

4 DR. VASQUEZ: All right. Anything else to
5 look at?

6 DR. MACDONALD: I was thinking of business
7 and industry, I mean, after all this morning's
8 discussion.

9 DR. VASQUEZ: Would that come under number
10 six as far as constructive engagement with key
11 stakeholder groups where the business and industry--?
12 We have industry there, but we don't mention it.

13 DR. MACDONALD: I see it there, but I also
14 see it as part of the infrastructure for change. I
15 mean, the reason we are doing all this stuff is
16 because we are listening to these people.

17 DR. VASQUEZ: Well?

18 MR. BULLOCK: Yes, I think industry
19 certainly would be a resource for grants.

20 DR. VASQUEZ: Okay.

21 MR. BULLOCK: An example given of Toyota
22 contributing to upgrade some classroom facilities and

1 things like that. We ought to consider industry.

2 DR. VASQUEZ: Could you form that in a
3 bullet? So that would be, how are we going to
4 support?

5 DR. MOSS: It's almost talking like agencies
6 that would provide financial support. I mean,
7 businesses, NSF, or whoever, I mean, all those
8 agencies that could provide funding for reform.

9 DR. MACDONALD: Also, knowledge.

10 DR. MOSS: Right, you're right.

11 DR. MACDONALD: What is the science that you
12 need for this in order to do that? That's what I was
13 thinking about.

14 DR. VASQUEZ: Okay. Could it be business
15 linkages with systems, school systems? Under that
16 then could be support, financial support, but it also
17 could be, as you said, knowledge support. Good. All
18 right, excellent.

19 Well, we can certainly come back. Let's go
20 on to number three. Boy, a fine font there.

21 Okay, now one of the things -- I'm not much
22 good here on this wait time, Shirley is much better --

1 as I was looking over this curriculum, as I mentioned
2 yesterday, so much of the state and local standards
3 determine what curriculum is going to be taught.
4 Then, it goes back to the time issue. It is how much
5 will be taught within the day.

6 I think somewhere, in my mind, something
7 that was left off of there is how do state standards
8 affect how the curriculum that is implemented into the
9 classrooms.

10 If you have an adoption state like Florida
11 or California or in Texas which adopt a certain
12 curriculum and mandate that those are the standards
13 and curriculum that you are going to use, then it
14 certainly has an effect on the classroom practice.

15 DR. LOPEZ-FREEMAN: The other impact is
16 going to be testing. The accountability systems in
17 the states that reflect or don't reflect the state
18 standards or national standards push very much on the
19 curriculum that's in place. In fact, get us tested
20 seems to get taught.

21 DR. VASQUEZ: That's right.

22 CO-CHAIR LEDERMAN: My story is that there

1 are many schools in the country that have decided to
2 do something sensible and teach physics before
3 chemistry, for example. Then, the state comes along
4 and says, "Well, we're going to have a test. The test
5 will be science, and it will be biology in the tenth
6 grade," wiping out this particular change.

7 When you protest, they say, "That's not my
8 department. I'm going to give you the science test,
9 and it's going to be in biology." They are
10 establishing the curriculum by the testing rather than
11 the other way around (chuckling).

12 DR. VASQUEZ: Assessment driving curriculum
13 and instruction is how you would phrase that.
14 Anything else under curriculum?

15 DR. MACDONALD: I was thinking of a way of
16 breaking away from infusing this innovation mentality
17 that it is that we're trying to get at, that it's
18 different than what is. If we keep pushing for AP and
19 IB courses.

20 DR. VASQUEZ: Can you speak into the mike?

21 DR. MACDONALD: How do we build in the
22 curriculum this whole sense of innovation, discovery,

1 you know, forward things that is what we need. We
2 don't need a lot of the same. How do we put it in
3 there, so that it is really curriculum--?

4 DR. VASQUEZ: This goes to your Project
5 LeAP.

6 DR. MACDONALD: This reads to me very much
7 of what is and isn't working. I'm just trying to
8 infuse it just a little bit with that innovation and
9 supporting innovation and exhibitions.

10 DR. VASQUEZ: Right. Supporting innovation
11 in curriculum design?

12 Larry, maybe you have a nice--?

13 MR. PRICHARD: Yeah. I just think it's all
14 there. I mean, I think we're beating a dead horse.
15 It's all there.

16 (General laughter.)

17 MR. PRICHARD: If you look at it, it's
18 consideration of a national strategy for blending or
19 integrating an alignment. I think if you look at that
20 part of that, then these other things would come out
21 in the committee to do that.

22 DR. VASQUEZ: Okay.

1 MR. PRICHARD: Like, the Project LeAP.

2 Again, I agree with Dr. Lederman that we allow
3 assessments at the state, and I know we do in
4 Kentucky, to drive curriculum.

5 Now, in one way, that's good; but if you do
6 it the way he brought it out, that's bad. We've got
7 to get that good/bad thing separated and put in its
8 right bucket. I like Mr. Shea's ideas of "buckets."

9 (General laughter.)

10 MR. PRICHARD: We've got to put it in the
11 right bucket.

12 DR. VASQUEZ: All right. Is that okay?

13 DR. MACDONALD: Yes, sure. I mean, I just
14 wanted to touch on that.

15 DR. VASQUEZ: Anybody else?

16 CO-CHAIR MALCOLM: Jim?

17 DR. VASQUEZ: Oh, yes, go ahead.

18 DR. GENTILE: I just want to underscore
19 without the STEM curriculum and undergraduate
20 education of teachers, that really has to be
21 coordinated well with all of the other curricular
22 issues. It can't be considered, "Oh, that will just

1 happen," because it won't. That undergraduate STEM
2 curriculum is really crucial to making sure that this
3 is going to work.

4 CO-CHAIR MALCOLM: Jo Anne?

5 DR. VASQUEZ: Yes.

6 CO-CHAIR MALCOLM: May I just underscore
7 what Jim said?

8 DR. VASQUEZ: Sure.

9 CO-CHAIR MALCOLM: One of the things that we
10 did in preparation for our work with the teachers in
11 D.C. is we have a university partner in that. One of
12 the things that we did was bring in Jo Ellen Roseman,
13 who heads Project 2061, to talk not to the teachers
14 but to the university faculty, to underscore what the
15 teachers are going to be held accountable for in their
16 instruction.

17 I think that if you go into most
18 universities, that may be the first time they have
19 seen that or had a discussion around standards or
20 around the content requirements. That is one element.

21 However, the other part of that is really
22 the pedagogical strategies that are used in teaching

1 teachers. Because one tends to teach as they are
2 taught and not as they are taught to teach.

3 DR. GENTILE: That's exactly right.

4 CO-CHAIR MALCOLM: We have this circular
5 thing, again, this system that is either going to do
6 us in or do us good. You're right, and I just want to
7 just underscore that.

8 CO-CHAIR LEDERMAN: Standards have a
9 biblical sense.

10 (General laughter.)

11 CO-CHAIR LEDERMAN: If you look at the
12 standards, they are 10 to 12 years old. They have
13 long since needed review, and the states ignore those
14 standards and have their own standards. What are we
15 talking about when we talk about standards.

16 CO-CHAIR MALCOLM: That is in bullets one
17 and two, okay, examination of the standards for
18 updating and for more faithful state adoption. I
19 mean, even the old ones are probably better than
20 diluting the old ones and adopting something that
21 isn't even worthy of adoption.

22 DR. VASQUEZ: I think that can be one of the

1 recommendations also under that one. However, I think
2 what we need to do is we will have to underscore the
3 effect of the standards on the state standards.

4 CO-CHAIR LEDERMAN: This third statement is
5 perfect.

6 DR. VASQUEZ: Right. That's right, we've
7 got it.

8 DR. LOPEZ-FREEMAN: I think what I would
9 like to consider is: is this getting at the issue of
10 the kind of learning that we want to take place?
11 Because this is talking about the standards, and to
12 some degree it is the organizational structures there.

13 Where we are talking about the learning,
14 which goes back to the Oprah Winfrey, the clarity of
15 vision idea, is that whole notion of the kind of
16 learning embedded in what we're talking about?

17 I'll pick a hot button, the merit of AP/IB
18 courses. What are we talking about when we are
19 defining effective teachers and the outcome being the
20 kind of learning that we want? Is it here? Is it a
21 cross-cutting issue?

22 DR. SYMMS-GALLAGHER: Yes, I think it's a

1 cross-cutting issue as part of that. However, I also
2 think that you are right, because the kind of
3 learning, if we look at how many people look at how
4 children learn from the Academy and the research and
5 how does that affect the kinds of curriculum decisions
6 that are made, I would say very few, except for some
7 curriculum.

8 We could certainly add that on there as
9 another bullet, and I think that would be excellent,
10 looking at how does the research on learning, teaching
11 and learning, affect curriculum and curriculum
12 decisions. Is it one of the issues?

13 (Perusing.)

14 DR. VASQUEZ: Yes, it's one of the
15 cross-cutting issues. I have to agree with Maria. I
16 hate to do that, but I have to agree with you, Maria.
17 I think you're right.

18 (General laughter.)

19 DR. LOPEZ-FREEMAN: Darn it.

20 DR. VASQUEZ: We go way back. I think
21 you're right, and I think that that would be nice to
22 also highlight and illuminate that there.

1 DR. GENTILE: When we look at research, are
2 we looking at application-based learning? Here is how
3 you apply science, technology mathematics?

4 DR. VASQUEZ: Definitely.

5 MR. BULLOCK: Also, it needs to be
6 egalitarian. This is not just for gifted kids;
7 everybody needs to know this.

8 DR. VASQUEZ: Right. Definitely, that was
9 one of the concerns of Leon's yesterday, the gifted
10 children. I think that as we mention those
11 cross-cutting, that fits in there.

12 CO-CHAIR MALCOLM: It all is cross-cutting.

13 DR. VASQUEZ: You're exactly right.

14 CO-CHAIR MALCOLM: However, wouldn't
15 Marie Alicia's concern about the kind of learning that
16 we want to take place begin to pick up problem-based
17 learning applications, the kinds of other
18 critical-thinking skills, and what have you, that
19 apply it basically?

20 DR. VASQUEZ: Exactly. All of that is part
21 of curriculum. I personally feel, and I don't know
22 how my colleagues feel here and we can certainly

1 discuss this, I think that we can illuminate examples
2 and point them out and, hopefully, maybe even have a
3 vignette of some sort.

4 I think what we need to be very careful of
5 is to get into the recommendations of a certain
6 curriculum. I think we can illuminate what we know is
7 good teaching of physics, of good teaching of
8 curriculum. I think we can really get mired down in
9 the bog with that one.

10 DR. MACDONALD: Jo Anne, I think that's
11 great advice, to really keep that in mind everywhere,
12 even if we just say Teach for America.

13 I mean, half of the country is going to say
14 "Have you looked at the research," how poorly their
15 kids are doing.

16 It looks like we are already finding some
17 programs that we are blessing, and that isn't the
18 case. I think if we keep those specifics, that's
19 good.

20 DR. VASQUEZ: Like I said, I think we can
21 give vignettes and I think we can point out good
22 practice and certainly point to the research that

1 tells why it's good practice, which is critically
2 important and why it does work. However, I think that
3 we need to steer away from just saying, "This is it,
4 we're stamping it." Believe me, we will get in
5 trouble.

6 Karen.

7 DR. SYMMS-GALLAGHER: Well, I think building
8 on what we have just been talking about with using
9 research, I think a cross-cutting theme needs to be
10 that we use database, actual data, from programs, from
11 our best practices, to remind people that
12 decision-making has to be based on data and not
13 ideology or other things. I think it is a
14 cross-cutting issue.

15 DR. VASQUEZ: I agree with you.

16 CO-CHAIR MALCOLM: I would remind you that
17 in that 9,272 reports, a lot of them were very
18 rigorous in terms of saying this was research-based,
19 data-driven in terms of our assessment here.

20 We wouldn't get into that. We could, in
21 fact, draw down from those places that have actually
22 looked and based on the evaluation of the research

1 would allow us to say, "This is a research-based
2 model. Here are the data."

3 I mean, you aren't saying "Take it" or
4 "Choose it." You're saying "Here is the data." Even
5 where we've given examples, I think that the examples,
6 like the examples that we put up there for Teach for
7 America," I think that was just by way of example.

8 In fact, if we look at alternative
9 certification models, perhaps one of the things is,
10 well, what are the ones that have been deemed to be
11 most effective? Where is the research base?

12 If there is no research base that helps us,
13 then obviously that's one of the things that needs to
14 be said, that there is no research base and that we
15 basically need to deepen our understanding in this
16 particular category. Because we need to be able to
17 draw people from mechanisms other than just fresh-outs
18 for high school.

19 If we state the "if" statement, if we need
20 to draw people from other mechanisms, then we need to
21 identify strategies that are effective in terms of
22 alternative certification.

1 DR. MACDONALD: Yes. I think that we can
2 probably get at that by getting into once the groups
3 start to work together, let's say, the higher ed group
4 might want to be talking to Teachers for a New Era,
5 that whole network that Carnegie has been behind
6 looking at research and using a lot of data.

7 We need to talk to them so that they will
8 also be singing our song. We need to include
9 conversations with a variety of people. I would talk
10 to Dan Fallon and say he is finding data, he is
11 pushing data, those kinds of things.

12 DR. SYMMS-GALLAGHER: I was trying to go
13 back to Dr. Bement's comment yesterday that in the NSF
14 now they require impact data evaluation. That is my
15 point, that we need to look at impact data. Are kids
16 really learning in this program? Have teachers really
17 changed their behavior in ways that we identified?
18 That is what we have to keep in mind.

19 Now, I'm not saying we will do it, but that
20 we have to keep in mind that evaluation is something
21 of impact on learning, and that it is a cross-cutting
22 theme on all of this.

1 DR. VASQUEZ: Just to see what works, okay.

2 Anything else on this one?

3 (No verbal response.)

4 DR. VASQUEZ: Well, we can come back and

5 review. We've added some things.

6 CO-CHAIR LEDERMAN: Jo Anne? Oh, I'm sorry.

7 DR. VASQUEZ: Go ahead. Are you ready?

8 CO-CHAIR LEDERMAN: No, a general comment.

9 DR. VASQUEZ: A general comment.

10 CO-CHAIR LEDERMAN: Sometimes if you have
11 some prejudice as to what a recommendation might be or
12 if we had collectively such a prejudice, it might
13 reshape our attitude towards the working groups. For
14 example, I have a prejudice that I think that one of
15 our recommendations could be that we have to pay more
16 attention to giftedness education.

17 Now, someone who has spent 12 years in the
18 Chicago Public Schools, and I don't want anyone to
19 call me elitist because my answer to elitism is when
20 we started the school for gifted kids was, "Wouldn't
21 you like the Chicago Cubs to be more elitist?"

22 (General laughter.)

1 CO-CHAIR LEDERMAN: Everybody in said
2 Chicago, "Yeah, absolutely." It's accepted that this
3 is elitist. On the other hand, in the essence of STEM
4 crisis of innovation, and so on, we can't neglect the
5 gifted.

6 We can argue all you want about extracting
7 from a high school the three or four kids who would go
8 to a special school, but it turns out that often it is
9 a pleasure to get rid of them because they are
10 trouble. They make trouble or they are bored or
11 whatever. Anyway, my point, though, is I'm interested
12 in generalizing the concept of giftedness.

13 Now, the school for gifted kids in Illinois
14 costs the state, and I've forgotten what it is now,
15 but let's call it \$20 million a year. Wouldn't it be
16 nice if there were another 20 or 30 such schools, one
17 in each state or one in most states?

18 The Federal Government encouraged this
19 because it is a national problem. They encouraged the
20 states and shared with them the expenses of creating
21 such a school.

22 It is expensive, because we decided it's a

1 residential school. You've got to bring everybody
2 from the state as available. It can't be local,
3 unless it's a great big city, and we don't have that
4 many. I like that idea as an important issue. My
5 question is: where does it show up in the working
6 groups?

7 DR. VASQUEZ: You had a question through all
8 that?

9 (General laughter.)

10 DR. VASQUEZ: Okay. I turn that over, too.

11 DR. MOSS: Doesn't it fit with those
12 cross-cutting categories or issues that you were
13 talking about: English language learners, EC, gifted?
14 Those are all those special populations that we have
15 to make sure that we're talking care of through all of
16 this I see that as.

17 DR. VASQUEZ: One of the cross-cutting
18 issues or categories?

19 DR. MOSS: Yes.

20 CO-CHAIR LEDERMAN: Yes, okay.

21 DR. MOSS: Because I think that we have to
22 go after those kids.

1 CO-CHAIR MALCOLM: Everybody has to go with
2 them.

3 DR. MACDONALD: If there is research on
4 where these kids have gone and what they have become,
5 these great, famous whatever, that is the research
6 that you need to justify.

7 CO-CHAIR LEDERMAN: Well, that research will
8 take 50 years or so. You take bright kids from a
9 school and you bring them into a special school.
10 Since you've taken them away from a school, you can't
11 prove that your addition is profound because they are
12 going to be successful anyway.

13 In order to judge whether, say, the Bronx
14 High School of Science would take someone, that has
15 long traditions, is more successful by taking or
16 extracting the kids from the various high schools in
17 New York and bring them to this special case.

18 Well, in the case of Bronx, I think you can
19 probably prove by now that that education they had
20 there was successful because you can count the number
21 of profoundly successful people in sciences and
22 business and everything else that came out of that

1 school. However, it's very difficult to provide
2 evidence unless you have a very, very long time scale.

3 DR. MACDONALD: You've been at that, what,
4 20 years?

5 CO-CHAIR LEDERMAN: This is twenty years.
6 By now the first graduates are in their thirties and
7 they are beginning to make a name in various places.
8 I mean, we could cite the fact that a '92 high school
9 graduate gave us a half a million dollars. That's
10 good, but it's not my criteria for great success
11 (chuckling). He just happened to be lucky in the
12 computer boom.

13 DR. VASQUEZ: It also could be an example of
14 innovation in how you reach special populations of
15 children. It certainly could be found in that
16 category, so good.

17 All right. On to four, "Higher education
18 linkage to K-12 STEM education, effective K-16
19 models."

20 Karen.

21 DR. SYMMS-GALLAGHER: Well, I mean, I want
22 to go back to what Jim has been saying. This, too,

1 has to be about the arts and science undergraduate
2 curriculum.

3 DR. VASQUEZ: All right. Would you like to
4 add that on there?

5 DR. SYMMS-GALLAGHER: Mm-hmm, yes.

6 DR. VASQUEZ: Okay.

7 CO-CHAIR LEDERMAN: I don't know where we
8 address the fact that the greatest leak in the
9 pipeline comes right there.

10 CO-CHAIR MALCOLM: Right.

11 DR. GENTILE: That's where it needs a lot of
12 tightening.

13 CO-CHAIR LEDERMAN: We can't allow a college
14 chemistry class to have 300 kids, and way, way down
15 there you see the little professor. It doesn't work.

16 DR. VASQUEZ: I think this gets to Maria's
17 comment about AP and IP and some of these students
18 that have these classes, and then they go to college
19 and those courses weren't rigorous enough and they are
20 not able to make it when they're thrown into 300
21 students. Finding the leak in the pipeline, yes.

22 DR. GENTILE: It is, but it's also a

1 philosophical thing because you hear the word
2 "cultivate" a lot, and so you hear the professor
3 saying, "I'm going to cultivate the class." They mean
4 weed out. Or, you hear others talk about "nourishing"
5 and "enhancing."

6 There is really a philosophical change of
7 mind that has to occur. It's not just the curriculum,
8 but it really gets into, Shirley, what you said, we've
9 got to talk to folks directly about the importance of
10 SP. Folks think they're doing the right thing, but
11 they may not necessarily be doing the right thing.

12 DR. VASQUEZ: You're making this tough to
13 retire (chuckling).

14 DR. LOPEZ-FREEMAN: Also, it's structural.
15 It's trying to bring together the best of those
16 departments to deal with this in ways that make sense
17 for the university and for the college that is dealing
18 with it, and also to bring to bear the fact that those
19 students that are cultivated will in effect become our
20 professors at institutions across the country. They
21 have to begin to think not only of their discipline
22 research but, hopefully, their research in learning so

1 that becomes as much of a priority. That is huge,
2 that's like a world change.

3 DR. VASQUEZ: It definitely is. We need to
4 capture that in a bullet, because that is the college
5 of arts and sciences, linkage to the colleges.

6 CO-CHAIR MALCOLM: You know, there is
7 another issue that is a lot bigger even than that, and
8 that is in looking at this, this is right now very
9 heavily weighted toward the development of teachers.
10 However, we kind of ignored this larger issue of the
11 development of citizens in these areas.

12 As I'm looking at this, I mean, I'm
13 concerned about the majors, even the majors are coming
14 out scientifically illiterate.

15 DR. GENTILE: Yes, absolutely.

16 CO-CHAIR MALCOLM: However, the non-majors,
17 who are going to become the congresspersons and the
18 judges and what have you and the newspaper people and
19 the venture capitalists and all of these things, we
20 haven't said anything up there about the structure of
21 coursework such that it gives an appropriate
22 representation of what science is even.

1 DR. GENTILE: That is exactly right. If you
2 look at what's happening now in just all of us, look
3 at what's happening now in science and find the
4 discipline, and you won't. Yet, what we still do is
5 choreograph some silo-like courses that come up.

6 We even heard if a person wants to be an
7 engineer, they better start by the time they graduated
8 high school to get into the trap because otherwise
9 there is not that kind of a thing.

10 Undergraduate curricula have to give unique
11 lateral mobility to students such that if they take a
12 course, they don't have to go back and say, "Oh, but
13 you didn't take chemistry 101 and that's required in
14 our curriculum, otherwise you can't go on and be a
15 chem major."

16 That affects the teachers, the teacher
17 educators of the future, because they can get
18 bottlenecked up and then as juniors find out they
19 can't get that chemistry emphasis because they didn't
20 take some jury-rigged barrier course. It's a big
21 issue.

22 DR. VASQUEZ: Okay.

1 MR. BULLOCK: The other thing is we need to
2 recognize is the fact that only 40 percent of the kids
3 that start college complete their undergraduate degree
4 in a six-year period. It's a symptom that a lot of
5 kids aren't prepared properly and they are dropping
6 out. It's a costly symptom.

7 CO-CHAIR MALCOLM: Money isn't up there, I
8 mean, support.

9 DR. LOPEZ-FREEMAN: Financial aid.

10 CO-CHAIR MALCOLM: Financial aid.

11 DR. LOPEZ-FREEMAN: It dawns on me I heard a
12 young man, who is actually a videographer for some
13 work at the hall and who was actually an engineer and
14 crossed over into cinematography, say that he felt
15 that the liberal arts of the 21st century was science.
16 I think what we're talking about is how that actually
17 transfers into the liberal arts of the 21st century in
18 terms of academic studies for university students.

19 I think that's what you're trying to get at
20 and how we can begin to really see that as part of
21 what needs to happen for a democracy, for people that
22 we want to vote with knowledge of science, with a

1 conceptualization of the real world of science.

2 CO-CHAIR LEDERMAN: Well, the University of
3 Chicago was until recently probably the most demanding
4 university for liberal arts knowledge of science.
5 Every liberal arts student had to take two years of a
6 laboratory science, one year in physical sciences and
7 one year in biological sciences, math through
8 calculus. It was a fantastic requirement.

9 Recently, they have gone in the wrong
10 direction. In spite of everything we know, they have
11 relaxed that. You know, the pressure on the part of
12 the other departments for requirement time is huge,
13 and sometimes the dean wins and sometimes the dean
14 loses.

15 I don't know how many universities will take
16 the rocks for jocks requirement and not be too
17 insistent that the graduates know any science. There
18 is a famous Shapiro videotape of the Harvard graduate
19 with all the graduates lined up, the liberal arts
20 students. Somebody asked why is it hot in the summer
21 and cold in the winter, and 22 out of 23 gave wrong
22 answers. It's pretty bad.

1 DR. VASQUEZ: To summarize here, are we able
2 to get all the points up there that you would like to
3 see?

4 CO-CHAIR MALCOLM: There is another problem,
5 and that is that we talked about K-12 education and
6 understanding how students learn, how learn students
7 learn. We have not talked about how young adults
8 learn and how best to teach them.

9 Many of the things that Ron, for example,
10 talked about on yesterday, there are a lot of young
11 people who need to understand the connection to the
12 real world.

13 You've got to have some alternatives in the
14 forms of instruction so that it can relate to the way
15 that people can view the world and that they can find
16 their shtick within kind of the instructional forms
17 that are being offered.

18 DR. VASQUEZ: Do you want to capture that
19 within a bullet statement there?

20 CO-CHAIR MALCOLM: Young adults.

21 DR. GENTILE: You could just say the content
22 versus pedagogy conversation, and that's what it comes

1 down to. The ways of doing the new pedagogies are
2 almost at direct odds with traditional content
3 definitions.

4 People will say, "I don't have the time to
5 do this, because it will take too long because that
6 leaves four book chapters untouched." I think that is
7 an important conversation to back up what Shirley is
8 saying.

9 CO-CHAIR MALCOLM: There is a really good
10 book by Dean McManus, "Leaving the Lectern," where he
11 gives a kind of blow-by-blow account of what happened
12 when he decided to shift the way that he taught.

13 This happened to be an oceanography course.
14 He talked about the courage that it took to know that
15 he was not going to cover the book, but, in fact, what
16 he had done was that he had given students deeper
17 learning in what he was giving them and then they were
18 able to learn a lot better on their own maybe the
19 other things that he didn't "cover." There are some
20 pieces out there of people trying this, to make a
21 difference and change, yes.

22 DR. VASQUEZ: Excellent point. I'm sorry,

1 one more.

2 DR. LOPEZ-FREEMAN: Professional development
3 for college professors.

4 DR. VASQUEZ: There you go, excellent. All
5 right. This probably gets at everything we've been
6 talking about. Boy, I could see suggesting that to
7 faculty.

8 MR. PRICHARD: May I interject one thing?

9 DR. VASQUEZ: No.

10 MR. PRICHARD: Okay.

11 DR. VASQUEZ: No, I'm just kidding
12 (chuckling).

13 MR. PRICHARD: I'm listening to this, and
14 I'm thinking in terms of coaching a basketball game.
15 It's going real well and we're pretty close and then
16 they throw the 6'10" kid in and it's like, "Oh, wait a
17 minute. I didn't have a defense for him. So now what
18 do I do?"

19 I want to go back to the P-16 Councils, the
20 K-16 Councils as you've called it, and give you an
21 issue here that when it says "Alignment of high school
22 graduation standards with college entrance

1 requirements," do you know what a task that is?

2 CO-CHAIR MALCOLM: Yes.

3 DR. VASQUEZ: I personally don't because
4 that is not my expertise.

5 CO-CHAIR MALCOLM: I served on the Maryland
6 K-16 Leadership Council, and I know how hard that is.

7 MR. PRICHARD: As you try to navigate those
8 higher educations of institutions or higher
9 institutions of education or whatever, the colleges,
10 when you try to navigate there, let me tell you'd
11 better look out for some dead horses and you'd better
12 look out for some real saddles because it is really,
13 really hard.

14 Those math people have one thing set, and
15 that's it. Those science people have one thing set,
16 and that's it. Then, to get through that is really a
17 problem for people in public education. Yet, those
18 are the people, as you say, that are sending us our
19 K-12 educators every year.

20 We were fortunate enough in Carter County to
21 form our own P-16 Council. By doing that, we went to
22 Morgan State University, which is our regional

1 university, and we said to them, "First of all, we
2 want math. We want you to bring your math department
3 up and sit down with us, our teachers, period."

4 At a table like this (indicating) they
5 brought their math teachers, the head of the
6 department, Dr. Hammonds came up, and the president
7 came up and they said, "This is unusual. We've never
8 had a request like this."

9 This is P-16 at the real bottom of the
10 world. I had all my math teachers, and I had a couple
11 of the community colleges and a couple of the colleges
12 represented. When we got a conversation going, we
13 realized we were nowhere in the ballpark as to what
14 they were doing.

15 However, they realized what they were
16 turning out and said, "Wait a minute." We started
17 doing some research in how many people in achievement
18 areas that we have coming from Morgan State University
19 that were teaching, for instance, mathematics.

20 Now, I didn't try to go into the size
21 process, because I didn't figure I could live long
22 enough. The math thing took me three years.

1 (General laughter.)

2 MR. PRICHARD: Here is what we came up with,
3 though, folks. Listen to what we came up with. In
4 that alignment, we went to the ACT test and we devised
5 with those teachers and my teachers a model ACT test
6 that we gave to our sixth, seventh, eighth, and ninth
7 grade students. Some great things came out of that.

8 I found I had children in my school system
9 that were scoring in the thirties. A couple of them
10 scored in the thirties on the ACT at seventh and
11 eighth grade levels. I'm going, "Wow, this is great.
12 What are we doing for those kids?" Now we've got
13 another issue.

14 However, they finally heard us, but it is a
15 navigation issue. It is not going to happen
16 overnight. As you said, it is not something that you
17 can change. Those people don't change. Those people
18 are really tough to deal with. I don't know how to
19 say it.

20 (General laughter.)

21 MR. PRICHARD: If you are going to align the
22 high school graduation standards with college entrance

1 requirements, the ACT, for instance, has got to be
2 part of it. Thank goodness the Kentucky Legislature
3 this year passed a law that said in the eleventh
4 grade, ACT will be part of the state's testing
5 process.

6 Coming back to the alignment of classes, we
7 had high schools who had algebra I and geometry and
8 algebra II. It was wild. We went back and aligned
9 all of ours. We have been the model for that
10 alignment of putting the math in the right sequence,
11 which I said a while ago, we have that in the bullet.

12 Now, would you like to go back and try to do
13 that to science? If you've got enough lifetime, you
14 should do that. However, I agree with you, the
15 physics should be first. You try to get them to
16 change that process.

17 They had to go to the colleges and said to
18 the colleges, "Would you guys like to help us in
19 change?" The answer is navigate that system and see
20 if you can.

21 I don't want to put a barrier. I don't
22 believe in barriers. That's one of the things I've

1 never believed it. You don't have barriers; you have
2 opportunities. You're moving through them. I don't
3 want this to be a barrier, but we've definitely got to
4 look at it.

5 Looking at your issue of school for gifted
6 students, why don't we have academies in our own high
7 schools for those? Academies are there for us, if we
8 would just take the take and process it. I think
9 those issues of higher education linkage, they could
10 really help academies out. That is my spiel on it.

11 DR. VASQUEZ: Are you volunteering to chair
12 that section?

13 (General laughter.)

14 MR. PRICHARD: No, ma'am.

15 DR. VASQUEZ: It sounds like you've had good
16 experience. Excellent. Thank you.

17 MR. PRICHARD: I don't have that much
18 lifetime left.

19 DR. VASQUEZ: Okay. Enlightenment,
20 excellent.

21 CO-CHAIR LEDERMAN: We don't have the
22 community college expert with us, but I think there is

1 an issue in minority-serving institutions that we see
2 in Chicago and it's worse in California and Texas.
3 Minority kids who stay in school, do everything right,
4 graduate from high school, want to go to college, but
5 can't do college work.

6 DR. VASQUEZ: Right.

7 CO-CHAIR LEDERMAN: That is a major thing.
8 Many, they want and they have all the motivations.
9 They've done it right. They listened to Oprah, and
10 they've listened to Michael Jordan, but they can't do
11 college work.

12 What do you do with them? Well, community
13 college is a possibility. However, universities are
14 the worse when it comes to remediation. It doesn't
15 work.

16 What does work? I don't know. Way back in
17 '94, I went down to see a friend of mine who was
18 deputy director of defense and I said, "Why don't we
19 revive the GI Bill?"

20 I profited from the GI Bill. Millions of
21 Americans went to college on the GI Bill that never
22 would have dreamed of going to college. They had

1 scholarships. Well, can't we revive that and then put
2 these students into peacetime armies for two years,
3 marching and that stuff, but also discipline?

4 Well, the Army was perfect at teaching just
5 what they needed. Kids couldn't read and they
6 couldn't do algebra. However, if you can fix that, as
7 the Army was able to do, you can solve a problem. I
8 don't know whether there is a way of bringing the
9 community college into it. It's the only other
10 resource I know that could do the remediation until we
11 fix the high schools.

12 CO-CHAIR MALCOLM: Actually, Leon, the other
13 set of institutions that we mention up there,
14 minority-serving institutions, have done a fantastic
15 job of taking students from wherever they are and
16 moving them to the next level.

17 I mean, I've seen this. I've seen students
18 who came in with incredible deficiencies, and they
19 were accepted in some of these Historically Black
20 Colleges and Universities. They were moved from
21 ground zero as it were. I mean, they were smart kids.
22 I mean, they were unprepared, but they were smart.

1 They were able to take the students and move them to
2 the next level.

3 We manage a program for the Packard
4 Foundation, the Packard Scholars Program. These are
5 students from HBCUs who are getting Ph.D.s in science,
6 engineering, and mathematics. You look at where they
7 came from and you say, "Well, how did they make it
8 through?"

9 I think we have to basically say, where does
10 the expertise reside anywhere about how you do this?
11 In a lot of those institutions, there is expertise
12 about how you do that.

13 You have Mississippi Valley State and
14 Tougaloo and places like that that some people have
15 never heard of, and yet they take this on and are
16 often very successful in doing it.

17 A lot of the models that we are highly
18 regarded, such as the work that Uri Treisman did, and
19 so on, they are based on coming to understand what
20 HBCUs were doing.

21 I like to quote J.W. Carmichael when he
22 talks about a lot of these students that he does not

1 throw them into the deep end of the water, that they
2 wade them out gently from the shore. They can vary
3 the input but they do not vary what is accepted on the
4 other end. You have to reach the standards.

5 However, how do you in fact give the
6 students the kind of study skills, the time management
7 skills, the kind of critical thinking skills, that it
8 would take to bridge some of that?

9 The other piece is that we should not just
10 think about U.S. models. For example, there is
11 rigidity within the European educational system as
12 well.

13 For example, if students choose to go into
14 the language-focused area or into some of these other
15 as opposed to the technical area, it is very difficult
16 for them to move over into engineering.

17 One of the programs that we saw in Sweden,
18 essentially set up by the university, was a year of
19 transition. It was essentially done to increase the
20 participation of young women in engineering because
21 they were in these other programs and then they
22 decided they wanted to go into engineering.

1 It was a year, and it gave them the courses
2 they had not taken. However, this was after they
3 graduated and it was in the university. They got the
4 physics; they got the calculus; they got the pre-
5 engineering. They got an introduction to kind of the
6 careers; they got an orientation, too.

7 We need to look at well, I think, at models
8 from outside of the U.S. as well as from other kinds
9 of institutions that do have this kind of experience
10 of taking students and moving them to the next level.

11 DR. VASQUEZ: Okay. Thank you.

12 HON. MR. STOKES: Can I make a comment?

13 DR. VASQUEZ: Okay. A comment and then we
14 have three other bullets to go through. Thank you.

15 Go ahead.

16 HON. MR. STOKES: No, I think Dr. Lederman
17 has certainly pointed up a very real existing problem
18 that has to be addressed. At the same time Shirley
19 has also said something that I want to emphasize very
20 carefully.

21 The Historically Black Colleges and
22 Universities are the experts. They have done an

1 extraordinary job with the same students that you are
2 referring to at the majority institutions. They are
3 confronted with this problem every day of taking these
4 students who need remediation, and they have developed
5 remediation programs.

6 However, they have done so also in a
7 cultural atmosphere where when you mix the culture and
8 the remediation together you produce some of America's
9 most outstanding minority graduates who have gone on
10 to be tremendous success. I'm not sure that the
11 answer to this is to send them over to community
12 colleges.

13 However, it would seem to me that with the
14 type of expertise that exists at these major
15 universities, they ought to be able to do something
16 similar to what the Historically Black Colleges and
17 Universities have done, which is combine a cultural
18 atmosphere with a remediation approach that can do the
19 same job.

20 DR. VASQUEZ: Excellent. Yes, definitely.

21 MR. BULLOCK: I just have one quick comment.
22 Wright State University, my alma mater in Dayton,

1 Ohio, reaches out to the Dayton Public Schools, which
2 have many underrepresented communities that don't
3 provide people that seek careers in STEM careers.

4 Start at the seventh grade and partnership
5 with Wright-Patterson Air Force Base, Central State
6 University, industry in Dayton. If these kids stick
7 with it, it's a summer program, through their
8 sophomore year, then they are guaranteed full-ride
9 scholarships to Wright State University.

10 DR. VASQUEZ: Excellent.

11 MR. BULLOCK: We are getting about, like,
12 52 percent. There are a lot of women here, too, that
13 are participating in STEM education careers. That's a
14 good model to take a look at in this linkage.

15 DR. VASQUEZ: I think we all have
16 experiences and it's excellent now we're bring all of
17 these together and we're bringing them all to the
18 table. That is what is going to make, hopefully, this
19 document very real, very liveable, very effective and
20 realistic.

21 We need to move on to the last three
22 bullets, and we only have 25 minutes to do that.

1 Let's take a look at bullet five, which is the role of
2 informal science education and the community and
3 parent inputs. Look that over to see if there are
4 things that we want to add.

5 (Pause in the proceedings.)

6 DR. MACDONALD: Yes.

7 DR. VASQUEZ: Can you talk up? Can you
8 speak up, please?

9 DR. MACDONALD: Yes. Yes, I think that what
10 we need to add for the informals is that there is a
11 differentiation between a science center and a
12 research-based informal like the field, the
13 Smithsonian, Natural History, all of those places.

14 If you are looking at the research-based
15 informals, we are looking at the contributions in RU
16 that are research experiences for undergraduates.
17 That is their role, and they have a big role.

18 They also have a big role in higher
19 education because postdoctoral students from the top
20 universities do their postdoctoral work at these
21 places.

22 I test pipeline for underrepresented groups

1 is heavily taking place at the informal sites, which
2 high school kids are working from seventh grade with
3 scientists, and they are all going to top science
4 universities. Some of them are involved in teacher
5 education and directly with the schools. That is the
6 education component of the informals that our research
7 based are doing across the country.

8 We might talk to some of them. The
9 Exploratorium, I know some people around the table
10 that are involved with Exploratorium, the Hall of
11 Science, the Harvard Museum, those the kinds of work
12 that they are doing in education.

13 How do we take care of that? Highlighting
14 it here is what's going to help us move the informal
15 and the formal on the service of advancement in
16 science and careers. This is the secondary row, and
17 this almost defines a science center that doesn't
18 necessarily have research behind it.

19 DR. VASQUEZ: Maybe that should be the first
20 bullet up there, then. Can you condense it to a
21 bullet? I'll challenge you. Can you condense that?
22 I think you're right.

1 DR. MACDONALD: I will put it in two.

2 DR. VASQUEZ: Oh. Two?

3 DR. MACDONALD: Yes. It is the role of
4 science education in higher education and informal
5 science education in schooling, formal school.

6 DR. VASQUEZ: I like what you said about
7 research.

8 DR. MACDONALD: Yes.

9 DR. VASQUEZ: Excellent. Anybody else?
10 Yes?

11 DR. THOMPSON: I was going to say, if I can,
12 there was a very small conference here. Maybe about
13 two months ago we brought in about 15 heads of
14 informal science centers ranging from media to science
15 centers, et al.

16 Three questions: the first question was the
17 relationship between informal science and K-12
18 education. There is a huge connect between informal
19 science and formal science, and it's probably
20 something that you may want to address.

21 The impact is great. You have probably four
22 or five centers that I know who do more teacher

1 professional development and training than
2 universities, so the impact that that those centers
3 have on teacher training and professional development
4 is extremely strong.

5 The third item really looks forward to the
6 21st century. Many of these centers, not the one
7 perhaps in Saint Paul and some of the others who are
8 new, but some of the centers are very old.

9 In Chicago, I was there during the holiday
10 season. They are looking at the Fuel Museum, simply
11 looking at "What do we do next?" You walk in and that
12 big coal thing is still sitting there. It's been
13 there for I don't know how long.

14 The question is as they move forward into
15 technology, what do they do next? Many of these
16 centers and science museums, et cetera, who have been
17 there for a while are really looking forward to making
18 a transition.

19 This Commission could be very, very fruitful
20 in helping them see what the transition should be and
21 how they can do both the underrepresented and the
22 gifted and others. You may want to look at those

1 three areas also.

2 DR. VASQUEZ: Yes, engaging the parents and
3 not only the parents but the public, public
4 understanding.

5 DR. MACDONALD: Oh. Yes, the public
6 understanding of sciences.

7 DR. VASQUEZ: Excellent.

8 DR. LOPEZ-FREEMAN: Jo Anne?

9 DR. VASQUEZ: Yes?

10 DR. LOPEZ-FREEMAN: Again, I don't know
11 where this fits but how many times do you not hear of
12 children or adults talking to you about the Discovery
13 Channel and the science that they are listening to?
14 Or, better yet, is it Myth Busters? You get more
15 mileage for science out of it than anything else.

16 (General laughter.)

17 DR. LOPEZ-FREEMAN: It is not informal
18 science as we know it in terms of institutions that
19 are science rich. Now you have a medium that is
20 actually supporting a lot more interest and engagement
21 in science that is rather diffuse.

22 It is like the shotgun approach, which is

1 okay, but you want to funnel it so that the net is
2 more focused on the learning of science. I'm going
3 back to this whole issue of the kind of learning that
4 we want to have students, adults, and children aware
5 of and engaged in. Where does this come in?

6 DR. VASQUEZ: I would think that definitely
7 fits under there because it's informal, definitely.
8 That would be media's effect on science education.

9 (Simultaneous discussion.)

10 DR. CROSBY: It does fit already because it
11 is not an institution.

12 DR. SYMMS-GALLAGHER: Right. It's not an
13 interest in molecular biology.

14 CO-CHAIR MALCOLM: There is another part,
15 and this may be one of the best things that we can do
16 in terms of strategies for engaging the public around
17 science.

18 There are groups that are already in
19 communities that are trusted members of communities
20 that are doing outreach and activities that don't have
21 a place. I mean, they don't do it from a museum.
22 They do it from a mall or they do it from a park or

1 what have you.

2 We have a partnership with an African
3 American women's service sorority. We were the
4 content providers and trainers. They aren't trying to
5 go off and create this, and yet their members are in
6 some cases scientists, engineers, and teachers. In
7 their chapters, they do activities in communities.
8 They organize their communities to deliver at a level
9 we could never get to.

10 Maybe if we kind of expand this, can we in
11 fact kind of do viral marketing to some of these
12 groups? I mean, it isn't just parent engagement, it
13 is community engagement.

14 DR. VASQUEZ: Well, the Girl Scouts are
15 doing a huge outreach, Girl Scouts and the Boys and
16 Girls Clubs. You're right, there are a lot of
17 organizations.

18 CO-CHAIR MALCOLM: Community- and
19 youth-serving groups.

20 DR. VASQUEZ: Well, maybe it's school and
21 community-serving groups. Maybe that needs to be
22 added under that bullet. All right, okay. Anything

1 else on that one?

2 DR. MACDONALD: I think that we could use
3 this, the platform, of a lot of the informals for both
4 meeting. I was going to suggest that if at any point
5 the leaders of this advisory board want to meet in
6 New York at one of the informals.

7 I'm sure we could host it, and you can talk
8 to other informals because there just happen to be a
9 bunch of them there. We could also do some
10 teleconferencing with other places. I'm sure the
11 Exploratorium would come on board and Saint Louis.

12 We could do that so that we get a better
13 sense of what are the natural linkages. I know that
14 if we were going to have a meeting, for example, in
15 February the museum is going to be having a couple of
16 conferences at the museum as part of AACTE.

17 One is with the teacher TNE, the "Teachers
18 for a New Era"; the Network of Universities is meeting
19 there on a Sunday; and then the City College and Bank
20 Street College are bringing all the NSF projects
21 funded to meet at the museum because they use the
22 museums or the city or the river or whatever for a lot

1 of their work.

2 That might be a time of the year, if we
3 wanted to, to kind of crash that party and get some
4 input or give them some of our original ideas they
5 could then respond to what we want to do. That is
6 just in terms of a location with some of that stuff.

7 DR. VASQUEZ: Excellent. Thank you. All
8 right, let's take a look at six, this is the
9 constructive engagement of key stakeholders.

10 MR. BULLOCK: I would suggest that we add
11 trade associations and professional societies to that
12 listing.

13 DR. VASQUEZ: Okay. All right, excellent.

14 MR. BULLOCK: I will undertake making sure
15 of the National Association of Manufacturers, but
16 there are also vertical trade associations. We are a
17 nation of associations.

18 DR. VASQUEZ: Right, exactly.

19 DR. MACDONALD: Most of them are here in
20 this region.

21 MR. BULLOCK: A lot of them are here in the
22 Washington area.

1 DR. VASQUEZ: Do I hear you saying you're
2 willing to chair that?

3 (General laughter.)

4 MR. BULLOCK: I would be happy to.

5 DR. VASQUEZ: Excellent. Bingo.

6 DR. GENTILE: The one thing I would add with
7 this, now that we have a chair, is that this is one
8 that can't wait.

9 (General laughter.)

10 DR. GENTILE: This is one that can't wait.
11 Because as I listened to Mr. Augustine this morning,
12 the lobbying starts yesterday.

13 DR. VASQUEZ: That's right.

14 DR. GENTILE: These were just the things
15 that I was thinking about where you tell them what
16 you're going to do, tell them what you are doing, tell
17 them what they need to know, tell them what you now
18 have done, tell them what you now will do, and tell
19 them what they now need to do. That has to be right
20 from day one.

21 DR. VASQUEZ: You ought to write that up.
22 That could be our vision statement right there.

1 DR. GENTILE: It is on one of these very
2 fine papers. It is a paper, and I'll share it.

3 DR. VASQUEZ: That is our action plan right
4 there. We've got it.

5 DR. GENTILE: I think that is really the key
6 thing is to not pop a surprise report on people.

7 DR. VASQUEZ: Right. Excellent.

8 DR. GENTILE: They have to be hungering for
9 this to come out.

10 DR. VASQUEZ: This is one of the things that
11 I think that perhaps the first conference call that we
12 set up amongst even all of us together, and I haven't
13 spoken with Leon and Shirley, but I've certainly been
14 thinking about that.

15 Now when you have a chance to go home and we
16 start the assignments maybe having a chance to sort of
17 think about how we can engage the public in this
18 conversation, what kind of outreach are we going to
19 do.

20 I am certain Elizabeth will give us talking
21 points to be able to make sure that we are sort of all
22 on the same page as we go out of course bringing in

1 our own wonderful perspectives from where we come. I
2 do think you're right. I think we need to go out and
3 start carrying the flag right now. Excellent. Good.

4 CO-CHAIR MALCOLM: Is there anybody left
5 off?

6 DR. VASQUEZ: Anything left off there? Key
7 stakeholders?

8 DR. HOFFMAN: Governors. Didn't you talk
9 about state governors at some point?

10 DR. VASQUEZ: Right. Excellent.

11 CO-CHAIR MALCOLM: They are going to be
12 meeting.

13 DR. SYMMS-GALLAGHER: Higher education.

14 DR. VASQUEZ: Yes.

15 DR. SYMMS-GALLAGHER: Higher education.

16 DR. VASQUEZ: I think some of the other
17 groups, NSTA.

18 MR. BULLOCK: NEA.

19 DR. VASQUEZ: NEA, the math people, the FTA,
20 the School Boards Association.

21 CO-CHAIR LEDERMAN: AFT.

22 DR. VASQUEZ: That would be sort of the

1 association of stakeholders that affect educational
2 practice.

3 CO-CHAIR LEDERMAN: The two big unions.

4 DR. VASQUEZ: Right.

5 DR. CROSBY: You cannot possibly name them
6 all.

7 DR. VASQUEZ: Oh. No, no, no.

8 CO-CHAIR MALCOLM: We have local school
9 boards, but we don't have state school boards.

10 DR. LOPEZ-FREEMAN: State departments of
11 education, legislatures.

12 DR. VASQUEZ: School board associations, do
13 we have those?

14 DR. SYMMS-GALLAGHER: Yes. Maybe the
15 associations just as a broad umbrella.

16 DR. LOPEZ-FREEMAN: NCSL.

17 DR. VASQUEZ: Anybody else?

18 DR. MACDONALD: The young children, ANUC and
19 NAEC.

20 CO-CHAIR LEDERMAN: It's a state
21 association.

22 DR. VASQUEZ: Okay. Anything else on this

1 one for right now?

2 MR. BULLOCK: I just noted, I talked to Norm
3 right when he was leaving, but we have a board meeting
4 of the National Association of Manufacturing at the
5 same time you're having the NSB Board meeting here and
6 also there is the Academy of Sciences. We've got a
7 couple hundred CEOs coming in to town that we can
8 probably enlist a few of them to wax eloquently about
9 the need for education reform.

10 DR. VASQUEZ: Good. Excellent.

11 CO-CHAIR MALCOLM: Let me just mention
12 another group that I think really gets this. There
13 are a lot of retired military, a lot of the generals
14 and admirals and what have you, who have been quite
15 vocal about the needs here.

16 CO-CHAIR LEDERMAN: Now, that's political.
17 They are all in a political group and yelling at the
18 president.

19 CO-CHAIR MALCOLM: Oh, but not about this.

20 DR. VASQUEZ: All right. Anybody else?

21 (No verbal response.)

22 DR. VASQUEZ: Excellent. Now, the last one,

1 as we look at number seven, of course keeping in mind
2 a lot of the things that we are going to be doing and
3 suggesting and recommending is how is it that we can
4 give some guidance to NSF and the programs that they
5 have affecting STEM education.

6 I think also we ought to take a look at what
7 they are doing. We had a wonderful overview yesterday
8 from Dr. Thompson. What are they doing? What are the
9 ones that they are seeing that are most effective
10 practices? What are things that can help us in our
11 work as far as they do a lot now with the research
12 that is going on in other fields? This actually is an
13 umbrella but it is also a category as well.

14 Yes?

15 DR. GRIFFITH: I thought of two things that
16 you might want to add to this list. One is the design
17 of metrics, more appropriate metrics, not just of
18 outcomes but also metrics that begin to relate
19 investment in K-12 and K-16 education and economic
20 development, which is a linkage that often isn't made;
21 and also quality of life, since we brought up the
22 quality of life issues this morning. I think that

1 whole area is appropriate for the Foundation.

2 The second area relates to
3 cyberinfrastructure. You have as a cross-cutting
4 theme the use of technology, and it appears in other
5 places.

6 I think the idea of a more rapid diffusion
7 of cyberinfrastructure and tools and capabilities
8 including what we used to call the NSDL, now the
9 "National STEM Digital Libraries," are really all
10 going to be part of that infrastructure and become
11 enablers for the other things to occur.

12 DR. VASQUEZ: Excellent. Hey, Steve, that's
13 our new board member.

14 DR. BEERING: There you go.

15 DR. VASQUEZ: Yes.

16 CO-CHAIR MALCOLM: Breaking her in.

17 DR. VASQUEZ: She is speaking.

18 DR. BEERING: You will be glad to know those
19 are all things in our new budget.

20 DR. VASQUEZ: Good.

21 (General laughter.)

22 DR. VASQUEZ: Betsy, would you like to add,

1 Dr. Hoffman, would you like to add anything to this?

2 DR. HOFFMAN: Well, I can just say that the
3 EHR Committee has been engaged for two years and is
4 going to continue to engage in working with the EHR
5 directorate on really helping to identify those
6 programs that really do work and perhaps programs that
7 are less effective, and to encourage to the extent
8 possible focusing resources on the programs that are
9 effective.

10 With Congressman Stokes here, I would like
11 to make a point that Dr. Thompson did not make
12 yesterday, that probably the most effective program,
13 as best we can tell from the research we've looked at,
14 out of the EHR is the Louis Stokes Program.

15 We had really a stunning presentation on
16 that program about six months ago showing dramatic
17 impacts of that program on success persistence of
18 minority students in STEM education and in STEM
19 careers.

20 What I would say is that what we are doing
21 at the EHR Committee is really trying to get out for
22 you the data that will be effective, the data about

1 what is effective from the education programs here at
2 the Foundation. Dr. Thompson, I was just mentioning
3 your presentation on the effectiveness of the Louis
4 Stokes Program, the LSAMP Program.

5 DR. THOMPSON: It really is amazing, I
6 think, when you compare it not just against the raw
7 numbers but we talked about what minority-serving
8 institutions.

9 What we have done with the LSAMP Program is
10 to try to take some of those lessons learned from the
11 minority-serving institutions and really link those
12 with almost 400 institutions around the country.

13 There are 25,000 graduates, 25,000
14 baccalaureate graduates, who are minority students
15 each year, and more than 225,000 students over the
16 last 10 years are currently there. It certainly is a
17 stellar program.

18 If you take a look at the students who go
19 through the LSAMP Program and compare those against
20 students in science classes who do not, you find that
21 the comparison is that the LSAMP students do better.
22 They also sustain their LSAMP careers.

1 After five to seven years after a
2 baccalaureate degree, they are still in STEM fields.
3 After five to seven years, half of those students have
4 gone on to either master's or Ph.D. programs and
5 completed. It really is a tremendous program for the
6 Foundation but certainly for this country.

7 DR. VASQUEZ: It needs to be emulated, you
8 are right.

9 CO-CHAIR MALCOLM: Yes.

10 DR. HOFFMAN: I just thought really since we
11 have the author of that program in the room that it
12 needed to be mentioned.

13 (General laughter.)

14 HON. MR. STOKES: I appreciate the update.

15 (General laughter.)

16 DR. VASQUEZ: Excellent. Well, we have
17 seven minutes with our portion here. We will write
18 all these bullet points down that have been so nicely
19 captured. Thank you. We will redistribute the list.
20 I believe as we go back and look at it, look at our
21 main list, we still are now going to need to decide
22 who is going to do the work.

1 We will need at least one or two chairs for
2 each one of those, and we can talk a bit about that.
3 I think Michael can give us some guidance about the
4 working groups and how we are going to be able to do
5 that, how we are going to be able to afford it within
6 our budget and to make it effective and quick, all
7 right. Elizabeth has had a few people that have --
8 oh, did you give that to Michael?

9 DR. CROSBY: No, no, no, you were talking
10 about you've got a few of the commission members who
11 have already--?

12 DR. VASQUEZ: We've have a few who have sort
13 of self-selected already.

14 DR. CROSBY: We've got one chair already of
15 a working group.

16 DR. VASQUEZ: Yes.

17 MR. BULLOCK: I would be happy to accept a
18 co-chair.

19 DR. VASQUEZ: Excellent.

20 DR. STRICKLAND: I know that Dr. Gentile was
21 also interested in that.

22 DR. GENTILE: I can get down to Colorado

1 easily from Montana.

2 DR. VASQUEZ: All right. Here is the chair
3 for informal.

4 DR. CROSBY: What we would like to
5 recommend, and I think it's in the working plan but
6 just to reiterate what Dr. Vasquez said, regulations
7 require, since you are a FACA committee, there are a
8 few regulations here, but working groups have a lot of
9 flexibility to bring in people that are not on the
10 Commission, but you have to have at least one
11 commission member who is chairing the working group.

12 For financial and logistics and group
13 dynamics reasons, the Board Office would respectfully
14 suggest that you look at these working groups being
15 around five people max.

16 Now, if you've got a couple of commission
17 members on each one of these, you could bring in two
18 or three outside folks. The working group would
19 probably be the best place to make that determination,
20 but that is up for you all to decide.

21 As I think Dr. Vasquez mentioned, we would
22 like to suggest that the most efficient use of your

1 time may be initially to at least have your first, if
2 not second, discussions of the working groups by
3 teleconference.

4 Then, of course, we can proceed, and I think
5 everybody is in agreement, that the working groups are
6 a great tool for outreach in and of themselves and
7 engaging with the broader community.

8 We want to get you all out into the broader
9 community so each working group can be thinking about
10 where they want to go and the reasons why you would
11 want to go there.

12 You are on a very, very fast time track, if
13 you are indeed approving the proposal that Dr. Vasquez
14 has laid out. However, it is critically important if
15 you do want to have the impact that I've heard you all
16 say, the speakers have said as well, there is such a
17 thing as a congressional cycle that you would want to
18 try to influence to the degree you can. It is
19 important to maintain this time schedule.

20 There are people from the Hill that are in
21 the room now listening to this great discussion. I
22 think they will look forward to seeing the outcome of

1 this. I think that summarizes.

2 DR. VASQUEZ: That's correct. Within the
3 constraints of the five people that you have on your
4 working group, four or five, it doesn't mean that you
5 can't call on the expertise to talk to people.

6 However, as far as the main core working
7 group, you're going to need to be certain that we keep
8 it within that. You who are going to be chair and the
9 people you choose, you need to choose people who are
10 going to be willing to help write and be able to work
11 and get your piece out as a draft.

12 Something that really resonated with me with
13 Norm or Mr. Augustine, I think that if we when we
14 finally get this, if we can come down to what are the
15 things we really think we can impact, the four, five,
16 or six things that are really just telling to go out
17 and just broadcast from the highest.

18 Of course, me right now my pressing issue is
19 time for science because it is not happening. That
20 would be my mantra. However, I think that we need to
21 decide collectively what our more important points
22 are.

1 With that said, do you want to read who has
2 self-selected so far?

3 DR. STRICKLAND: I don't know entirely what
4 you guys would like to do, but I know that we just
5 decided that Bullock and Gentile would like to take on
6 the number six job of stakeholders.

7 I think I heard Dr. Macdonald saying that
8 she was interested in chairing maybe the informal
9 science group, which may make sense. I don't know, I
10 haven't heard any other specific volunteers.

11 Mrs. Baker, you might be interested in
12 teacher preparation.

13 CO-CHAIR MALCOLM: Number one.

14 DR. STRICKLAND: Number one.

15 HON. MRS. KASSEBAUM-BAKER: Or, help with
16 number five, number one or five.

17 DR. STRICKLAND: Okay. Oh, and Dr. Vasquez
18 is interested in doing the curriculum one, number
19 three.

20 DR. VASQUEZ: I could draft Tim with that.

21 MR. MCCOLLUM: I'm thinking probably number
22 one.

1 DR. STRICKLAND: All right. Number one we
2 have McCollum (chuckling).

3 I'm sorry, Mr. Prichard, what were you
4 saying?

5 MR. PRICHARD: I'm just like him, I'm trying
6 to catch up. We're in education, so we get behind.

7 DR. MACDONALD: Mrs. Baker wanted to work on
8 five with me.

9 DR. STRICKLAND: Okay. This is true, if
10 there are seven working groups, you guys can each be
11 on two and that would even things out.

12 CO-CHAIR MALCOLM: I'm going to do one
13 through six.

14 DR. VASQUEZ: I'm going to do one through
15 seven as well. The guidance was just to sort of take
16 a look at that with the guidance of the EHR Committee.

17 DR. CROSBY: Yes, you can definitely do
18 that. I would encourage you that there are some
19 things that working group can start doing now.

20 DR. VASQUEZ: I think the idea is maybe to
21 find which of those programs like the Louis Stokes,
22 some of the programs that have been so effective, and

1 be able to really highlight what is effective about
2 that and the impact.

3 CO-CHAIR LEDERMAN: The OMB, is that going
4 to be included in this?

5 DR. CROSBY: You can include whatever you
6 want in you report, and we will get all of the
7 information that you would like to have. OMB is
8 already being very, very open and positive about
9 sharing that with us.

10 MR. BULLOCK: Could the Board collect for us
11 what some of the goals are of the various legislative
12 initiatives, for instance, the American
13 Competitiveness Initiative?

14 DR. CROSBY: Oh, yes.

15 MR. BULLOCK: They want to graduate 70,000
16 additional teachers to lead AP and IB math and science
17 courses.

18 DR. CROSBY: The Board has already been
19 interacting very significantly with the Hill on this,
20 so we've got this material put together.

21 MR. BULLOCK: This would help guide, I
22 think, the working groups.

1 DR. CROSBY: Sure.

2 MR. BULLOCK: Here are the outcomes that we
3 would like to see funded in various pieces of
4 legislation.

5 CO-CHAIR MALCOLM: Mrs. Baker?

6 HON. MRS. KASSEBAUM-BAKER: Well, there is a
7 plan along with that that is in the book the
8 legislation that has been put forward on that.

9 DR. CROSBY: Right.

10 CO-CHAIR MALCOLM: Let me warn us not to get
11 too embedded to the legislation because it cherry
12 picks particular items. I think that one of the
13 things that was really clear after looking at 9,272
14 reports was that the reason that we have had problems
15 in the past is because we did the things that were
16 easier or more compelling or more whatever, but we
17 ignored other components of the system.

18 This in a way at least in the working groups
19 picks up all of the key systems components. We can
20 come back probably and look at the legislation and see
21 to what extent it is being addressed within that.
22 However, if we get too embedded to what is on there,

1 we may overlook some things.

2 HON. MRS. KASSEBAUM-BAKER: Shirley, I agree
3 with that. If I could just add, and I sort of hate to
4 sound like the skunk at the picnic. One of the
5 reasons I remember "A Nation at Risk" so well maybe is
6 because it was the first and most dramatic, but it was
7 very simple.

8 CO-CHAIR MALCOLM: Yes, it was.

9 HON. MRS. KASSEBAUM-BAKER: It was very
10 simple. It wasn't pages of all wish lists. It was
11 focused and simple.

12 CO-CHAIR MALCOLM: Right.

13 HON. MRS. KASSEBAUM-BAKER: I tell you it
14 sounds wonderful to do the scholarships for 7,000
15 teachers, and so forth, but I don't think that's going
16 to happen.

17 I think, frankly, we have to be very careful
18 that we don't end up with too much of a wish list that
19 people do put it on the shelf. I think the success of
20 this is how it's sold.

21 It has to be realistic enough, as you laid
22 out earlier, I think to make an impact on why it is

1 absolutely essential. If it's a 500-pound gorilla,
2 it's going to be very hard to get the attention, I
3 think, that it needs.

4 I don't have any great suggestion, although
5 I kind of go back to what I said yesterday. Who is
6 going to mind the store? It's easy to lay it out.
7 Those are the people we have to reach. I have to go
8 back to the local level, because that is who puts it
9 in place.

10 If we want to give the states something to
11 help with the academies or something, then that goes
12 into federal legislation that always mandates more
13 than it pays for. Then, it gets back at the state
14 level, and there is not the money to do it.

15 We all easily can get into that area, I
16 think, when we put too much of a wish list at the
17 federal level. I could be wrong, but I've seen it
18 happen with the disabilities legislation and now with
19 the new No Child Left Behind legislation.

20 CO-CHAIR LEDERMAN: The charge says we have
21 to make a difference.

22 HON. MRS. KASSEBAUM-BAKER: We can make a

1 difference, but I would just argue let's be careful we
2 don't do it in such a massive way that people will
3 say, "Well, what do we focus on here?" Do you see
4 what I'm saying?

5 CO-CHAIR MALCOLM: I think that the focus on
6 implementation takes a lot of things off the table in
7 a good way.

8 HON. MRS. KASSEBAUM-BAKER: Right.

9 CO-CHAIR MALCOLM: Okay. In a good way. If
10 you look at a program, a program cannot work for one
11 of two reasons, it can either be a failure of design
12 or it could be a failure of implementation. It could
13 be a good design that is implemented poorly. That
14 means that you can go someplace and find a program
15 where the design is actually operating.

16 Maybe part of what we need to do is to focus
17 on some of the process ideas that come out of all of
18 these reports. Then, the program ideas, they are the
19 raw material.

20 They are the bricks that are over there, but
21 not focus too much on a lot of the program ideas
22 because what has hung us up has been, number one,

1 getting started, and, number two, getting full
2 stakeholder support. A lot of those kinds of
3 elements, those action elements have been the things,
4 those process elements have been the things that
5 haven't worked.

6 The program things, they sit out there and
7 there are lots of those things that can be done.
8 However, if we get hung up on those, I agree with you
9 totally, that is a never-ending list.

10 But if it is considered that those things
11 are the grist, then you begin at a very different kind
12 of a level. That was one of the reasons I liked the
13 Business-Higher Education Forum Report so much was
14 because it did focus on the things to do, the how-to,
15 the implementation, the action, the execution, and not
16 necessarily just on the what. We have to talk about
17 the what. I think that you're right, the simpler the
18 message the more likely it is to be listened to.

19 DR. STRICKLAND: In the interest of trying
20 to move us along, may I suggest that we kind of figure
21 out who else wants to do some of these other groups?

22 Dr. Gallagher.

1 DR. SYMMS-GALLAGHER: I will do four.

2 DR. STRICKLAND: Okay. Which is the higher
3 education one. Certainly, people can be involved in
4 many of these, but if you have a particular interest
5 in one of these, it's helpful to do that.

6 DR. MOSS: Elizabeth I'd like to do number
7 one.

8 DR. STRICKLAND: Okay. The places that we
9 are really still needing people are more the NSF
10 group, I don't know who is the best person for that;
11 also curriculum; and number two, infrastructure
12 reform.

13 HON. MR. STOKES: Either two or seven.

14 DR. STRICKLAND: All right.

15 DR. LOPEZ-FREEMAN: Three.

16 DR. STRICKLAND: Three. All right, who is
17 being quiet here? Mr. Prichard?

18 MR. PRICHARD: No, no, no.

19 DR. STRICKLAND: Which one of these sounds
20 most intriguing to you? Number two, infrastructure
21 reform, is that something that sounds appealing to
22 you? I can't see everyone all at once here.

1 DR. CROSBY: Well, I think you've got a
2 pretty good start anyhow here. You can maybe ask the
3 leadership to twist some arms after the fact, if there
4 are some vacancies.

5 CO-CHAIR LEDERMAN: By the power vested in
6 us.

7 (General laughter.)

8 DR. STRICKLAND: I am happy to do that, so
9 feel free to pester me if this doesn't seem right.

10 DR. GENTILE: Would you review it?

11 DR. STRICKLAND: Yes, let me go through what
12 I have so far. For the first group, which was STEM
13 teachers, I had Baker, McCollum, and Moss had some
14 interest.

15 HON. MRS. KASSEBAUM-BAKER: I'm just
16 helping, yes, but then I signed onto five, so take me
17 off of one.

18 DR. STRICKLAND: All right.

19 HON. MRS. KASSEBAUM-BAKER: One is enough.

20 DR. STRICKLAND: McCollum, it sounds like
21 you're up for one. Is that good?

22 MR. MCCOLLUM: That's my one.

1 DR. STRICKLAND: All right. And Cindy Moss,
2 so those two for number one. Then, for number two,
3 infrastructure and reform, I have Stokes. Anyone
4 else?

5 (No verbal response.)

6 DR. STRICKLAND: For number three, which was
7 the curriculum one, I have Vasquez and Dr. Gentile and
8 Lopez-Freeman. Good.

9 For number four, higher education, I have
10 Gallagher and Lopez-Freeman, okay. I would assume
11 that Dr. Boggs and Dr. Herschbach, who are not here
12 with us might be interested in that as well with their
13 background.

14 CO-CHAIR MALCOLM: On which one?

15 DR. STRICKLAND: Higher education. Number
16 five was informal education, and I have Macdonald and
17 Baker, right?

18 DR. MACDONALD: Yes.

19 DR. STRICKLAND: Then, for number six, the
20 various share stakeholders, I have Bullock and
21 Gentile. All right, then, for NSF I have Mr. Stokes.
22 Others?

1 CO-CHAIR LEDERMAN: I'll join.

2 DR. STRICKLAND: Dr. Gallagher. Okay, that
3 would be great.

4 DR. MOSS: Elizabeth?

5 DR. STRICKLAND: Yes?

6 DR. MOSS: You can add me to number two.
7 I'm also interested in the infrastructure.

8 DR. STRICKLAND: Okay. Oh, that would be
9 great. Well, feel free to give me input if you guys
10 think about this.

11 DR. VASQUEZ: I don't think it means, just
12 because we're taking the leadership of it doesn't mean
13 that we can't call on the expertise of all of us
14 around the table as we not only look at our working
15 groups, don't you think, but we can talk to one
16 another.

17 CO-CHAIR LEDERMAN: I think also a working
18 group has a chairman, but there are also constituents.

19 DR. VASQUEZ: Right.

20 CO-CHAIR LEDERMAN: There I think you might
21 want advice because there are lots of people out there
22 we know about that might serve.

1 DR. VASQUEZ: Defintely.

2 CO-CHAIR LEDERMAN: Maybe once you advertise
3 the chair, the rest of us can say, "Look, you want to
4 get this guy and this guy on your working group."

5 DR. VASQUEZ: Excellent. I'll have
6 Elizabeth as soon as she drafts this out then send it
7 out to all of us, and we can sort of lead us to the
8 people who might be able to get the work done and help
9 us and have good insight. All right, excellent.

10 MR. PRICHARD: May I?

11 DR. VASQUEZ: Yes.

12 MR. PRICHARD: Also as we go down this, if
13 we see some things that we would enjoy writing about,
14 could we get in touch with the chairman and say, "I'm
15 going to send you a white paper on my thoughts on
16 this"? Would that be acceptable?

17 DR. STRICKLAND: Sure.

18 DR. VASQUEZ: Excellent.

19 DR. STRICKLAND: Absolutely. Maybe it would
20 be helpful if I said a little bit about sort of
21 logistical things.

22 DR. VASQUEZ: Yes.

1 DR. STRICKLAND: I'm happy in the Board
2 Office to help coordinate all of the sort of
3 exchanging of information and things so that you all
4 have what you need to do your jobs well.

5 I'll make sure that you get all of the
6 PowerPoint presentations that were given yesterday and
7 any of the other reports. I know Dr. Malcolm
8 mentioned some reports which have not been previously
9 distributed. I'm happy to provide those for you or
10 anything else.

11 It's very helpful for me if you can sort of
12 funnel to me so that I can distribute properly
13 contacts you're making and programs you're hearing
14 about that are useful so that we can get you guys
15 talking to each other. Let me serve you in that way.

16 DR. CROSBY: If I could just underscore, the
17 Board Office staff are your staff. They should be
18 used as the focal point for all of these logistical
19 and information things. Elizabeth is the point person
20 for that, so absolutely use her, please.

21 We have a lot of other staff. We have
22 contractual support. The Board is committed, I think

1 the chairman has given instructions that the Board
2 Office will provide the support you all need. We've
3 got a lot of people that are in the wings waiting to
4 support your efforts. Just work through Elizabeth,
5 and we will get you everything you need.

6 DR. STRICKLAND: One more logistical item.
7 Several of you have asked me about scheduling of
8 meetings. I think I'll try to do this by taking an
9 email poll shortly after this when we might schedule
10 the next full commission meeting.

11 I think they were originally planning to
12 have that in November sometime, and then certainly
13 when we can also start to do some teleconferences and
14 things for working groups and set up real live face-
15 to-face working group meetings also.

16 Yes?

17 DR. SYMMS-GALLAGHER: I really encourage us
18 to get a schedule for the full year, so we can get it
19 on our calendars.

20 DR. STRICKLAND: Yes. Now, that you all
21 have sort of agreed to the general gist of the working
22 plan in terms of how this will proceed, I can

1 definitely; we can nail down some dates.

2 DR. MACDONALD: Just to go back on the
3 dates, the time that I mentioned in New York in
4 February is the last week. I think the AACTE meets, I
5 don't know, it's like the 23d to the 27th or something
6 like that. We thought it would be good to meet and
7 then try to bring in some people from other places.

8 DR. STRICKLAND: Great. That raises another
9 point. If you all have particular locations that you
10 think are key because of the types of constituency
11 groups that you would interact with, we would want to
12 think about that. Also, if you know of locations
13 where there would be a place that would be willing to
14 host us, that would be useful, too.

15 CO-CHAIR MALCOLM: Elizabeth, it would be
16 very useful if the Board Office could, maybe with the
17 assistance of the commission members, identify key
18 stakeholder meetings that are coming up.

19 See if we can't get to somebody who is in
20 the leadership of those so that if possible we could
21 either get on the agenda or send materials that they
22 could communicate within their meeting about the

1 existence and the charge and the interest.

2 DR. STRICKLAND: Absolutely.

3 CO-CHAIR MALCOLM: Because the comment that
4 you made about you've got to start by telling them
5 that you're going to be coming, "The Commission is
6 coming, the Commission is coming." No. That means
7 that we have to have a schedule. We have to know who
8 is out there who is going to be meeting. They may
9 want a human being. That means that that has to be
10 slotted into that as well.

11 DR. STRICKLAND: That's a very good point.

12 CO-CHAIR MALCOLM: Our calendar is one
13 thing, but a stakeholder calendar is another issue.

14 DR. STRICKLAND: That is a very good point.

15 DR. GENTILE: Like the Math people.

16 DR. STRICKLAND: All right. Well, it sounds
17 exciting. Are we done? Closing statements?

18 DR. CROSBY: Dr. Vasquez, are you finished
19 with yours?

20 DR. VASQUEZ: I am. Thank you so much, and
21 I turn it over to my illustrious Leon and Shirley,
22 co-chairs.

1 SUMMARY OF NEXT STEPS

2 CO-CHAIR LEDERMAN: Shirley will write the
3 recommendations, the first draft.

4 CO-CHAIR MALCOLM: Right. I feel like I'm
5 in an opera.

6 (General laughter.)

7 DR. VASQUEZ: Did you tell them that you're
8 going to be on Science Friday.

9 CO-CHAIR LEDERMAN: Two hours.

10 DR. CROSBY: Two hours.

11 CO-CHAIR LEDERMAN: Somewhere about 2:00, I
12 think, or 2:30.

13 DR. SYMMS-GALLAGHER: Awesome.

14 DR. VASQUEZ: Excellent.

15 CO-CHAIR MALCOLM: He is already doing it.

16 DR. VASQUEZ: He knows people in high
17 places.

18 CO-CHAIR LEDERMAN: Is there anything you
19 don't want me to say.

20 (General laughter.)

21 DR. MACDONALD: No, no, you're good.

22 CO-CHAIR MALCOLM: Would you listen to us

1 anyway?

2 CO-CHAIR LEDERMAN: Can I say we're doing a
3 hell of a job?

4 DR. MACDONALD: Yes.

5 DR. GENTILE: We take no prisoners.

6 (General laughter.)

7 DR. MACDONALD: Leon, do you want to be on
8 the Colbert (phonetic) Report?

9 CO-CHAIR LEDERMAN: On what?

10 DR. MACDONALD: On the Colbert Report. I'll
11 get you on that, if you want to be on it.

12 CO-CHAIR LEDERMAN: Yeah.

13 CO-CHAIR MALCOLM: That would be scary.

14 DR. MACDONALD: All the Senators are in it.

15 CO-CHAIR LEDERMAN: Does anybody have any
16 last wishes?

17 (General laughter.)

18 DR. CROSBY: Can I ask if the commission
19 members are all finished with any comments they may
20 wish to make at this meeting, then I might ask
21 Dr. Beering if he had any final comments as the Board
22 Chair.

1 DR. BEERING: Thank you very much. Let me
2 say that having chaired the several years of effort on
3 the indicators and then our companion piece for our
4 principal author, Jo Anne Vasquez, and then the three
5 regional meetings throughout the nation and then
6 having the Board agree and the Congress agree that we
7 should have this Commission, I am overjoyed at what
8 I've seen in the last two days.

9 You have come together as a team. Everyone
10 is of one mind. We are agreed, I think, on our
11 purposes. We have a unified vision.

12 I am so very thrilled that everyone around
13 the table has entered into this discussion with
14 openness and eagerness and has volunteered for
15 appropriate slots in the work plan. I am convinced
16 that we are going to do what Norm Augustine and his
17 commission did, and come up with a very workable set
18 of recommendations.

19 I look forward to, depending on what the
20 calendar looks like when we finish it, to interacting
21 with you as we go through this next year. What a
22 great start. Congratulations. On behalf of the

1 Board, many thanks. Good speed ahead.

2 THE COMMISSION: Thank you.

3 DR. CROSBY: Then, this meeting is formally
4 adjourned.

5 (WHEREUPON, at 12:18 p.m., the meeting was
6 adjourned.)

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