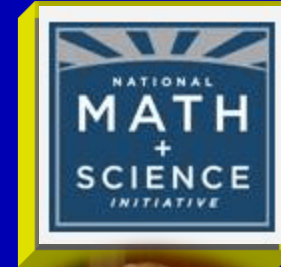




National Academies
Convocation on Rising
Above the Gathering Storm
Two Years Later:
Accelerating Progress Toward a
Brighter Economic Future

Breese Quinn
University of Mississippi

THE NATIONAL ACADEMIES
Advisers to the Nation on Science, Engineering, and Medicine



Norm Augustine



Charles Vest



Tom Luce

Goals

- ✦ Take stock of the accomplishments of the past several years.
- ✦ Strengthen engagement among the various stakeholders seeking to renew American innovation.
- ✦ Explore how progress can be sustained and accelerated.

Participants: ~500 attendees from ~32 states



- ◆ Largest IPO in history conducted

→ **China**

- ◆ New research university launched with \$10 billion day-one endowment (took MIT 142 years to reach that level)

→ **Saudia Arabia**

- ◆ 200,000 students will study abroad, mostly in science and engineering, often under govt. scholarships

→ **China**

- ◆ Govt. investment in nondefense R&D set to increase by 25% over next few years

→ **United Kingdom**

- ◆ Multi-year initiative underway to make country global nanotechnology hub

→ **India**

- ◆ High level commission conducting a follow-up to Gathering Storm with objective of job creation

→ **Australia**



Our Progress

- ◆ **Over 100 newspaper editorials and op-eds (every state!) supporting GS conclusions**
- ◆ **Presidential Initiative in 2006 State of the Union**
- ◆ **Legislation**
 - ◆ **FY2007 CR funded some GS priorities**
 - ◆ **FY2008 Omnibus enacted some GS recommendations**
 - ◆ **America COMPETES authorized most GS recommendations and passed overwhelmingly**
- ◆ **Private Sector**
 - ◆ **Exxon Mobil: \$125M for K-12 Math & Science**
 - ◆ **NMSI: Exxon Mobil/Gates/Dell**
- ◆ **Business & Education lobbying for**
 - ◆ **Doubling basic research budgets**
 - ◆ **VISA reform**
 - ◆ **Strengthened R&D tax credit**



Challenges

- ⬅ **US dropped from 1st to 7th in preparedness to benefit from IT advances**
- ⬅ **Education**
 - ⬆ **No new funding for improving M&S achievement**
 - ⬆ **Out of 30 nations, US 26th in Science, 25th in Math**
 - ⬆ **US engineering students declined further**
 - ⬆ **2/3 US engineering Ph.D.s to non-US citizens**
- ⬅ **Research**
 - ⬆ **Basic research funding not substantially increased, some programs cut**
 - ⬆ **R&D tax credit allowed to expire, dozens of nations now have greater incentives for private sector R&D**
 - ⬆ **Remnants of Bell Labs sold to French firm**
 - ⬆ **Fermilab cuts led to layoffs and “holidays”**
 - ⬆ **ITER cut this year**
- ⬅ **Business**
 - ⬆ **US trade deficit in high-tech increased**
 - ⬆ **Nearly all US high-tech firms expanding offshore research labs**
 - ⬆ **US companies spent 3x more on litigation than research**
 - ⬆ **80% of US CFO's state they are curtailing R&D to meet profit projections**
- ⬅ **Congress has not agreed on visa and green card reform**



Bob Schieffer, CBS News: Moderator



Craig Barrett, Chairman Intel



Sally Ride, CEO Sally Ride Science



G. Wayne Clough, President, Ga. Tech

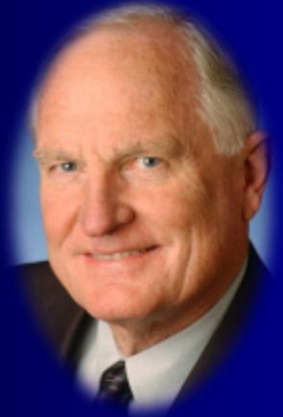


◆ Why has nothing happened?

- ◆ Lot has in other countries
- ◆ 300k downloads of GS Report abroad

◆ Why elsewhere and not here?

- ◆ In US, sound bites, election cycles – “We’re fat, dumb, and happy”
- ◆ People see S&T important in abstract, but don’t see it impacting them personally



◆ **How bad/good is education system?**

- ◆ **K-12 sucks in every way (monopoly), univ. good (competitive)**
- ◆ **Not enough STEM teachers who know their subject (1 in 1200 teachers hired outside Atlanta in-major)**

◆ **Single most impt. thing new President needs to know/do?**

- ◆ **Teacher training (10k new STEM teachers)**
- ◆ **Make energy the new “Sputnik”**



- ⚡ **Creative thinking is what matters and we still excel. What's the problem?**

 - ⚡ **Chinese, Indian, etc. have become entrepreneurial, creative. They're developing graduate programs quickly.**
- ⚡ **Congress already seems to "get it". How can we translate that recognition into votes?**

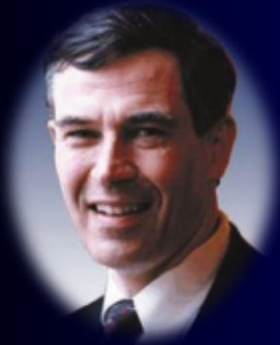
 - ⚡ **Toss them the energy/Sputnik softball**
 - ⚡ **Lack of will is primarily at national (Federal) level. Change presidential advising process?**



Hutchison

- ◆ Emphasized US secret is creative collaboration between academia and industry
- ◆ Most important need is more in-major teachers
- ◆ Mentioned Hutch/Bing/Alex letter supporting COMPETES

Holt



- ◆ R&D underinvestment is a societal problem – values science in abstract, but doesn't understand it (process/impact)
- ◆ 50's ed. Model produced best scientists, but left behind 80% of population. Need an electorate who support science.
- ◆ Praised Pelosi, criticized Hutchison
- ◆ Lack of traction – economy doesn't look like a “crisis” yet.
- ◆ 911 commission got recommendations passed by setting up full time DC lobbying office
- ◆ GS is somewhere between that and sitting on a shelf.



Gordon

- ◆ GS formed a plan and COMPETES passed, but...
- ◆ List of things need to do (add \$900M to supplemental, patent reform, R&D tax credit, H1B, ARPA-E)
- ◆ Help get science in supplemental passed!



Alexander

- ◆ New energy “Manhattan Project” being proposed today at Oak Ridge with Gordon, Wamp.



Hinojosa

- ◆ Need earl recruitment of STEM students
- ◆ Legislation to expand women and minorities in STEM

Wolf



- ◆ Emphasized huge negative impact of the “tsunami” of our national debt
- ◆ Small level of discretionary spending because mandatory spending has gone from 1/3 in 60’s to 2/3 now. Nondefense discretionary will be down to 15% of budget in 5 years.
- ◆ 40% of debt held by other countries, \$1T by China alone.
- ◆ Leading a new bipartisan Congressional commission to look at *whole* budget reform, including entitlements, with a goal of putting the result to an up-or-down vote.



Johnson

- ◆ Need to educate minorities in STEM, or in the future we will be eliminating more than half of our resources.

Bodman

- ◆ Focus on energy research
- ◆ DOE Osc has not seen budget increases. Congress needs to fund COMPETES
- ◆ Basic research is the foundation
- ◆ Need to attract talented people into ranks of government service

Spellings

- ◆ Talked up various programs: No Child Left Behind, Math Now, NMSI, UTeach

Gutierrez

- ◆ Our pre-eminence is not guaranteed
- ◆ NIST & nanotechnology were highlighted
- ◆ Reform of intellectual property rights is key
- ◆ Need openness in trade (Free Trade Agreements, e.g. Colombia) and people (immigration reform)

Research

◆ Overview

◆ Arden L. Bement, Director NSF

- ◆ Due to lack of funding, 3000 researchers hurt or lost
- ◆ Several planned research centers will not happen now
- ◆ Basic science is 18% of US R&D

◆ Steven Chu, Director LBNL

- ◆ DOE Osc received \$40M out of authorized \$600M
- ◆ 0 out of 1400 proposals in new, transformational science approved
- ◆ Regarding energy “Manhattan Project”, we are closing our recruiting stations
- ◆ *Basic* research is key

◆ Session summary

◆ To be added

Higher Education

◆ Overview

◆ **C.D. Mote, Jr., President Univ. of Maryland**

- ◆ Little progress in GS recs
- ◆ Need a crisis (preferably national security) to get movement, alternatively a relentless, grassroots effort that tells its story better

◆ **Kristina Johnson, Provost Johns Hopkins**

- ◆ Progress in energy will have to come from conservation efforts. Advances in alternative production methods have too limited potential
- ◆ Have to get budget doubling passed
- ◆ US needs to once again become global leader in grand challenges

◆ Session summary

◆ **To be added**

Innovation

◆ Overview

◆ **Deborah Wince-Smith, President Council on Competitiveness**

- ◆ Accelerate HP computing
- ◆ Most R&D in US along traditional lines, little money for frontier interdisciplinary research
- ◆ Fields like entertainment, marketing, archaeology, etc. need to be brought in
- ◆ Innovate in education, e.g. at Annapolis, engineering is a part of everyone's degree
- ◆ All profits for big US companies are from overseas divisions
- ◆ Need to fully fund COMPETES, establish WH level innovation committee, lead world in frontier discovery, entrepen., economy

Innovation

◆ Overview

◆ Gail Cassell, VP for Scientific Affairs, Eli Lilly

◆ GS Innovation goals were

- ◆ Patent reform – no progress

- ◆ Innovation tax incentives – US has 2nd highest corporate tax rate, R&D tax credit expired

- ◆ Universal broadband – minimal progress

- ◆ Governors/states actually doing a lot

- ◆ Need strong university/private sector collaborations

◆ Session summary

- ◆ To be added

K-12 Education

◆ Overview

◆ David Ferraro, Gates Foundation

◆ To be added

◆ Francis (Skip) Fennell, Prof. Education McDaniel College

◆ To be added

◆ Session summary

◆ To be added

State Strategies

◆ Session summary

- ◆ **Generally agreed that more progress has been made at the state level than the national level (no real surprise)**
- ◆ **Easier access to executive branch (governor, Dept. of Ed., etc.) is a big help moving things forward, bringing together and aligning different constituencies.**
 - ◆ AR: private sector initiatives in STEM fairly easy to pass through leg.
 - ◆ LA: LONI
 - ◆ National Governors Association a good avenue
 - ◆ Top-down vision and coordination more efficient than bottom-up efforts
- ◆ **Grassroots efforts direct to public are necessary**
 - ◆ “Reverse advocacy” to local organizations (e.g. Ch. of Comm., Rotary, churches)
 - ◆ **COPUS** (Coalition on the Public Understanding of Science)
 - ◆ State initiative model (e.g. CA)
 - ◆ CA did state version of GS
 - ◆ Need short term solution component (scaled to term lengths) paired with long term sustainability
 - ◆ MN: Formed a coalition of high-tech industry, museums, academia, etc. to set common goals and present a unified voice

America COMPETES

◆ Session summary

- ◆ **Reportedly a very unproductive session filled mainly by K-12 reps and practitioners**
- ◆ **Basically did a hand clap approval survey of all COMPETES items and ranked them, making a couple of priority changes**
 - ◆ e.g. Put search for alternative energy ahead of basic fundamental research