Federal Funds for Science and Technology. Lobby Work.

- Congress needs to hear the science story.
- They need to hear what they get for the money.
- But science groups have not helped much with key questions.
  - How large a science enterprise does the US need?
  - How can we set priorities?
  - How can we measure success?
  - How can we strengthen the government-university partnership?
- This is a collection of news stories about science budgets and efforts to lobby for more money.
- Most stories are about the USA. Some are from other countries.
  - It is useful to browse through the stories.

*Ready Sep 3, 2003, 24p; RJ0294

Just to browse and help form an opinion

Roy Jenne
Aug 28, 2003
Some Comments about the R&D Funding Stories

Roy Jenne
Sep 2, 2003

I hope that you can take a little time to browse the R&D funding stories here.

Jan 1997: Science funds had been rather tight for two years. Then the mood for spending really changed. See B, Items 10, 11.
  ▪ In Nov 1997 we read, “Congress chomping to spend surplus.”

Apr 1997: Science societies protest Clinton’s R&D budget. Presidents of 23 societies protest the plans. They represent over 1m scientists, mathematicians, and engineers.

Oct 1997: (B, item 27) Over 100 scientific and engineering societies sign a statement to call for doubling R&D funds over the next decade.
  ▪ They represent over 3 million people.
  ▪ “And that number is of interest to any politician.”

Jul 1998: (B, item 42) The head of the OMB wanted to know how much research the US needs. He says that “more money” is not a good answer.

Nov 1998: High tech lobbies Congress (B, items 57 to 60)

Feb 1999: Summary of NIH budget information (B, item 53)
  ▪ 10 events during 1996 – 1999
Federal Funds for Science and Technology, Update Aug 2003

Roy Jenne
Aug 2, 2003

1. Sep 1989: NSF’s summer of discontent
   The call has gone out from the friends of the National Science Foundation: Circle the
   wagons. The budget for 1990 is facing cuts in both House and Senate.

   NSF’s budget has grown steadily in recent years, but the White House wanted a higher
   growth. The House bill puts NSF R&D spending up 8.3% for 1990, but this is lower than
   the Bush request (Science, 1 Sep 1989, p 927).

2. Mar 1995: Russian parliament boosts science funding
   Conditions for science in Russia got very bad after the fall of the USSR in 1991 (Nature, 30
   Mar 1995).

3. Jan 1997: Leaders protest cuts in science supports
   A story from Germany (Science, 24 Jan 1997, p 475)

4. May 1997: Five-year (US budget) plan squeezes R&D
   But what happened? Not sure. But NIH budgets doubled from $13.6 b in 1998 to 27.3 b
   in 2003. (Science, 30 May 1997, p 1328)

5. Nov 1997: Easing the squeeze on R&D
   There is a strong economy and broad support for R&D in Congress. Probably R&D will do
   even better in budget battles in 1998 than in 1997. (Science, 21 Nov 1997, p 1390)

   A big fight is shaping up over how to spend the surplus money that could start flowing into
   the treasury as early as Fall 1998. (Denver Post, Nov 30, 1997)

7. Feb 1998: Science catches Clinton’s eye
   “Clinton has requested a massive boost to biomedical and basic science funding in 1999.
   What’s different this year? (Science, 6 Feb 1998, p 794)

8. Apr 1998: First balanced budget in 3 decades; Clinton’s R&D spending plan looks great,
   but...
   This is a good 6-page story in Physics Today, Apr 1998.

9. Apr 1998: US legislator warns of hollow promises on research spending

10. May 1998: “Think of a number and double it”
    The US budget is in surplus. A bill in the Senate would double civilian R&D from $34b
    per year to $68b over the next 10 years (Nature, 7 May 1998, p 1).
11. Jun 1998: Making the case for Federal Support of R&D (Science, 12 Jun 1998, p 1671) Franklin Raines, head of the Office of Management and Budget (OMB) under Clinton, was leaving his post. He wrote this good editorial. He asks: (1) How large a science enterprise does the US need? (2) How can we set priorities in the R&D enterprise? (3) How can we measure the success of the research programs? (4) How can we strengthen the government – university partnership?

He says that the follow-through by the research community was disappointing. He does not need wish lists.

**PLEASE SEE THIS EDITORIAL.**


- Science Advice to the President (Science, 16 Dec 1988, p 1489)
- NOAA revived for the green decade (Science, 8 Jun 1990, p 1177 – 79).

USGS planned to increase the cost of data to offset some of the cuts. Update: I think that Congress gave more money (Science, 11 May 2001, p 1040).

14. Jan 2002: Record science budgets evaded proposed cuts
(Science News, Jan 12, 2002, p 20.)

15. May 2002: Community hails bill to double budget (of NSF)
It says that science lobbyists have spent 4 years to get equal treatment for the National Science Foundation (double its budget, now $4.8b). The bill would increase the NSF budget by 15% per year (Science, 17 May 2002, p 1213).

**NOTE:** The NSF budget was about 3.4b in 1998.

16. May 2002: The NIH budget in the “Post doubling” era
Useful to read (Science, 24 May 2002, p 1401)

17. May 2002: NSF moves with VIGRE to force changes in academia
From 1992 to 1999, the number of math majors dropped by 23%. Many new math graduates could not find jobs. NSF wants to make math teaching more user friendly. (Science, 24 May 2002, p 1389)

18. Sep 2002: NSF fights changes in oversight bill
(Science, 27 Sep 2002, p 2187)

From 1970 – 2001, real funds for physical sciences have been fairly flat while life sciences grew a lot. A plot is shown (Science, 6 Sep 2002, p 1622).
20. Dec 2002: NSF budget doubling (plan) stalls but increases likely  

21. Dec 2002: NSF urged to boost spending on facilities  
(Science, 13 Dec 2002, p 2112.)

22. Jan 2003: US societies unite in plea for boost to research budgets  
The bad economy and possible Iraq war mean that 2004 could be a bad year for science  
agencies. On Dec 27, 2002, 32 societies signed a letter to Bush and his budget director.  
They urged an increase in funds for science (Nature, 9 Jan 2003, p 100).

23. June 2003: Retrenchment at the Max Planck Society (Germany)  
The Max Planck Society is being forced to shrink its operations after a decade of expansion  
(Science, 13 June 2003, p 1638)

24. Jun 2003: Biologists disappointed as NIH budget falls flat  
The budget for NIH (Institute of Health) was doubled in 5 years, from 13.6 billion in 1998  
to $27.3 billion in 2003. Now the increases will be smaller (Nature, 26 Jun 2003, p 905).

25. Jun 2003: House bill signals the end of NIH double-digit growth  
The NIH funding would go up only 2.5% – to $27.7b, which is a halt to the very fast  
growth.

NIH supporters say the agency needs an increase of at least 8.5% to maintain gains from  

The House bills would increase federal R&D spending by 7% to $126b. The majority of  
ewn funds would go to defense, homeland security, and bioterror programs. NSF would  
increase by 6% and NIH by 3%. Some programs would stay flat or decrease (Science, 22  
Aug 2003, p 1031)

Science lobbyists hope to preserve a host of provisions now in House or Senate bills. The  
DOE Office of Science has had a budget of about $3b per year. The House bill would  
allow this to increase to $5.7b by 2007 (in 3 years) and the Senate bill would top out at  
$5b. This doesn't actually provide the money, but backers say that it would help their  
efforts to double DOE's science budget. (Science, 29 Aug 2003, p 1164)
US Federal Funds for Science & Technology

The outlook for federal funding of US science and technology appears to be very good. The two political parties are each making kind statements and calling for increases in science funds. If anything, the Republicans are now more supportive, because they say that the amount of increase called for by Clinton is too small.

Of course, there are other forces such as balancing the budget, and the large increases in spending for entitlements that have been almost completely neglected in these news stories.

1. **Jun 1995: Gingrich Urges Panels (in Congress) to Spare Science**
   *(Science, 9 June 1995, p 1428)*

2. **Oct 1995: House Bundles 7 R&D Programs.**
   *(Science, 20 October 1995)*

   This action brought bills to fund 7 R&D programs (from various agencies) together. Rep. Walker said that it makes sense to look at science funding in a coordinated way. The seven agencies, now funded at $24.5 billion, would receive $21.5 billion under the bill. See EOS magazine (Dec 19, 1995) for a report on "NAS calls for comprehensive science budget." It said that a NAS committee of 18 scientists issued this report on Nov 29, 1995 (My comment: I have some worries about too much consolidation).

3. **Oct 1995: Clinton defends R&D in Partisan Speech.**
   *(Science, 27 October 1995)*

   The news story said, "Support for science used to be something that Democrats and Republicans could agree on. Not any more." Since fall 1994, science has become a bitterly partisan issue. The President denounced drastic cuts (by Republicans) in the $72 billion federal R&D budget. Al Gore called the cuts, "unwarranted, unwise, and unnecessary."

4. **Jan 1996: 5.7% Increase Catches NIH by Surprise.**
   *(Science, 12 January 1996, p 136)*

   The National Institute of Health (NIH) was one of the few agencies that went from rags to riches in the budget negotiations last week. It will get a 5.7% increase for 1996. This tops the 4.2% increase asked for by Clinton, and far exceeds the 2.6% offered by the Senate Appropriations Committee.

5. **Jan 1996: Scientists must break silence on federal funding says NSF Chief.**

   Neal Lane, chief of the National Science Foundation (NSF) said that “We are now challenged to more clearly articulate the benefits of federally funded research and education to a nation that is largely uninformed about science and increasingly skeptical of federal funding.”

   He said to scientists: If you don't take it as one of your duties to inform your fellow citizens about the importance of science, then the public support will not be there when you need it. Lane noted that during “this year” of budget battles, there is a perceived stony silence from the science and technology community *(EOS Transactions, Jan 30, 1996)*

**Scientists must tell the science story.**

- 6 -
(Science, 28 June 1996)

Japan spent $21 billion on science and technology in 1992, and $27 billion in 1996. During the next five years, they will spend $170 billion. This will give about $42 billion by the year 2000 (double the 1992 amount). There has been much talk in US science circles about the "doubling of funding" in Japan. The US R&D advocates think that the US should have a similar plan.

We will see later that budget increases for Japanese science will be much smaller than these plans indicated.


Both the democrat (Clinton's plan) and Republican (Congress) plans call for non-defense R&D funding (in constant 1995 dollars) to go down from $32 billion in 1996 to $27 billion in the year 2002. Walker (who leads science in the House) says that Republicans have been unfairly attacked for planning to cut science. The Clinton administration is planning cuts almost as deep. Volker (D-Missouri) defended Clinton's commitment to a balanced budget. He accused Walker of trying to make the President look bad (in terms of not enough support for Science).

8. Sep 1996: Democrats Score Highest in "Votes for Science" Review  
(Science, 26 September 1996, p 288)

Science Watch, a new lobby group, counted votes on 30 key science votes in Congress. They say Democrats voted in favor of science twice as often as Republicans. This story came out before the fall election of 1996. (Nature, 26 Sep 1996, p. 283) talks about the dangers of this sort of coarse politics, and the problems with how the votes were selected. Walker (R-Pennsylvania) sent a letter to Science Watch saying, "I hope that in the future you will review your methodology and not succumb to the temptation to further politicize science." My comment: This type of politics is really bad news.

(Science, 18 October 1996)

The big cuts proposed for research funding in 1995 did not happen, but long-term funding prospects are uneven regardless of who wins the election in November.

(Science, 17 January 1997)

"Scientists have not grasped reality: Dollars do not fall out of the sky anymore" —Rep. Steven Schiff (R-New Mexico). The bad fiscal environment confronting congress is forcing science activists to adopt more aggressive tactics. The scientists say: We must do more lobbying. Our old ways don't work anymore.

11. Jan 1997: Senate Bills Back Huge Increases (Research Funding)  
(Science, 31 January 1997, p 608)

Barely a month ago, research lobbyists began pushing for a 6.5% increase next year (1998) in the $12.75 billion budget of the National Institutes of Health (NIH). They assumed that was as much as they could expect from a penny pinching Congress. Their recommendation of a 7.1% increase for the National Science Foundation (NSF) seemed so unrealistic that people speculated on what they might be drinking.
Last week, Senate Republicans were falling all over themselves with promises to do more for basic research than the lobbyists had dreamed possible (double the NIH budget over 5 years; double the research budgets of a dozen federal agencies over 10 years; etc.). So far, these are kind words, but not money as yet.

12. Jan 1997: Republican Senators Promote Doubling of Funds for Research
(Nature, 30 January 1997, p 375)

Phil Gramm’s bill would increase funds for science and medical research from $32.5 billion to $65 billion in 2007 (increases of over 9% each year. This doubles the funds in one decade. Another bill would increase NIH (medical funds) even faster.

13. Jan 1997: Science Bodies Seek 7.1% Increase for NSF

Two leading US scientific societies are demanding an increase of 7.1% in the budget of the National Science Foundation in 1998. This was backed by biologists (43,000 members) and chem society (152,000). The American Physical Society has not endorsed it yet because they consider it too high and too specific.

(Nature, 30 January 1997, p 382)

The German Green Party has reversed its policy, and it issued a report actively backing research and development. Since the party’s foundation in the early 1980’s, it has been skeptical of science. They say, "We now accept the basic importance of science and technology to society." The report says that the goals of research should be reoriented toward sustainable development and social responsibility. They also say that basic research should have a higher priority than applied research. They criticize the policy of the German government. My comment: I have noticed similar trends in thinking in the US. It is a welcome trend if it does not put science in the middle of politics.

15. Feb 1997: Smoother Road for R&D Spending?
(Science, 14 February 1997, p 916)

What a difference a year makes. After two years of uncertainty, the White House and Congress seem to be moving toward stable funding for Science & Technology. Last week, Clinton proposed a Science & Technology budget that increased by 2% for 1998, to $75.5 billion. This includes defense spending.

16. Feb 1997: Should governments support Science?
(Science, 7 February 1997)

Mostly this gives the case for funding, but there is some argument.

17. Feb 1997: Basic Research Gets Bipartisan Treatment
(Nature, 27 February 1997, p 759)

A bipartisan group of US senators has set up a Science and Technology Caucus, which will work to build political support for basic research, and for partnerships between government and industry. The group was founded by Lieberman (D-Connecticut) and Frist (R-Tennessee). Frist was a heart surgeon by profession. Frist said he would like NIH to get an increase in funds of about 5% for 1998 rather than the 2.6% proposed by President Clinton (we will see later that NIH got a 7.1% increase).
(*Nature*, 6 March 1997, p 7)

Professional societies (23 of them) representing over 1,000,000 US scientists, engineers, and mathematicians have joined forces to call for a budget increase for research funded by the federal government (a press conference was held March 4). They claimed that this request for 7% strikes a fair balance between present US fiscal pressures and the need to invest in activities that enable long-term growth.

Biomedical researchers did not join this effort because they are campaigning for a still larger budget increase for the National Institutes of Health (they want a 9% increase for NIH).

(*Physics Today*, April 1997, p 53--another version of the news above)

Presidents of 23 professional societies joined forces on March 4, 1997 to protest the Clinton budget for 1998, which called for an R&D increase of 2.2%. The societies urge 7%. The 23 societies represent more than one million scientists, mathematicians, and engineers.

- A speech: "We cannot abdicate world leadership on the road to a balanced budget."
- All the Presidents commended Senator Phil Gramm (R-Texas) who introduced a bill in Jan 1997 that would double the spending for basic science and medical research over the next decade.

(*Nature*, 13 March 1997, p 114)

A majority of the American public support doubling funding for medical research in the US. More than half of the public agreed to pay more taxes to support this goal.

(*Science*, 18 Apr 1997, p 343)

Last week there was a very warm reception from legislators who set the NSF budget. Officials hope for a budget increase larger than the 3% increase for 1998 that was asked for by President Clinton in February 1997. NSF officials told Congress that they had asked for a larger increase (to $3.5 billion) but it was turned down by Clinton (the Administration requested a 3% increase to $3.37 billion). One panel aid in Congress said that a 5% increase for NSF could be done.


The first half of 1997 was spent by Republican and White House efforts to hammer out a 5-year plan for a balanced budget. The agreement got a lot of press and a lot of praise. The Investor’s Business Daily (IBD) warned that past budget deals resulted in big boosts in spending, with promised spending cuts put off until much later. This budget deal continues the trend. See IBD, January 2, 1998.

(*Science*, 30 May 1997, p 1328)

There was an historic balanced budget agreement between the Administration (Clinton) and Congress. It leaves no room for an R&D funding increase in the next five years. A chart to year 2002 shows flat funding for five years (so a decrease in real dollars) Senator Phil Gramm will go ahead with his plan to double civilian government research from $32.5 billion to $65 billion in 2007.
(Nature, 12 June 1997, p 646)

The budget deal reached in May 1997 would cut spending on science and technology by 16% in real terms by 2002, according to George Brown (D-CA). Brown has been very interested in Science & Technology.


Rep. John Porter (R-IL) said that NIH is due for a raise of $2.5 to $3 billion in 1999 (Science, 31 October 1997, p 796). This would be a very large percentage increase.


Strict funding limits were set by the White House and Congress budget pact in summer 1997 to eliminate the US deficit. One house aid said that because of the budget agreement, civilian R&D funding is going down.

As a result, the Office of Management and Budget (OMB) has put the screws to agency requests for FY 1999. For example, NASA was forced to submit a budget that is a huge $1 billion below the $13.6 billion for FY 1998. DOE and other agencies are in a similar struggle with OMB.

Veteran watchers of science budgets are not panicking yet. There is some room to negotiate. Final figures will not be public until January 1998 (See Science, 10 October 1997, p 211).

27. Oct 1997: Unity marks effort to bolster R&D (Double the R&D)
(Science, 31 October 1997, p 796)

Three Senators introduced legislation to double Civilian R&D spending from $34 billion to $68 billion during the next decade (by the year 2008). These were Phil Gramm (R-Texas), Joe Lieberman (D-CT), and Pete Domenici (R-NM). More than 100 scientific and engineering societies signed a statement that calls for the doubling of R&D funding during the next decade. Allan Bromley (President of the American Physical Society) noted that all of these R&D groups together amount to 3 million people, "and that is a number of interest to any politician."

Last week, a host of R&D organizations and politicians gathered in the House and Senate. The next day, Gingrich (R-GA) started a related project and major study. Gingrich challenged a group of 30 scientists to come up with "a mission large enough to mobilize a nation—Don't come up with something that says you need $3 million for a marginal project that fits everything you are already doing." See the news article.

This report was commissioned by the above item.

This report to congress has dozens of recommendations to help the US maintain its science leadership. It notes how science drives the nation's economy, and includes the need for federal funding. Scientists should communicate more of their results to the general public, in plain language. House Speaker Newt Gingrich asked Ehlers to prepare the study. Newt called the report a good beginning, but he challenged Congress to create an even bolder, more dynamic report. Newt thought that NASA had slowed down the job of getting into space. George Brown (D-Calif.) said that the report was very good, but the report should open up more policy issues. Sensenbrenner (R-Wisc.) says he and others intend to act on the recommendations of the report. (EOS magazine AGU. Oct 6, 1998, pp 477-478.)

(EOS Magazine, 28 October 1997, p 478 (a publication of AGU American Geophysical Union)

Leaders of 106 scientific and engineering organizations last week called on the US Government to double the federal budget for research by year 2009. The groups represent about three million scientists, engineers, and
mathematicians. They called for a “decade of investment” in health, environment, technology, and other research.

30. Nov 1997: NIH gets 7.1% increase for FY98.
(Nature, 6 November 1997, p 6)

Joint congress committees approved a 7.1% increase in NIH to $13.65 billion (almost official now).


This newspaper article said that a big fight is shaping up in Congress about how to “spend” the surplus money that could start flowing into the Treasury as early as fall 1998. The budget masters at the White House ask, “What surplus?” and chide the optimists for trying to spend money that has not yet appeared. Some of the proposals to spend money are: (1) reduce the debt; (2) give a tax cut; (3) infrastructre (roads, bridges, rail, etc.); (4) help the Social Security fund; (5) more for education, science, defense, health research, etc. During November 1997 – January 1998, there have been several articles like this.


Science funding advocates were hoping for big things from a policy speech by Clinton on December 16. However, he gave very few clues about his proposed R&D budget.

R&D advocates back a Senate bill that calls for doubling civilian R&D over the next decade. White House officials have criticized the Senate Bill as unrealistic; fiscal responsibility is needed as well as investment in R&D, they say (Science, Vol. 278, 19 Dec 97, p. 2045).

33. Jan 1998: Clinton will seek an extra $billion for biomedical research.

Clinton will ask for nearly an 8% increase for NIH and 9% for NSF according to sources. Last month, Clinton said that the next 50 years will be mainly viewed as an “age of biology.” Clinton asked for increases for NIH of 3.9% and 2.6% in 1997 and 1998; Congress granted much more: 6.9% and 7.1% respectively. The Administration is tired of letting Congress grab credit for hefty increases in funding for NIH. Science reported that an Ad Hoc Group for Medical Research Funding (with over 300 advocacy groups) were going to meet in Washington DC on January 14, 1998. An observer predicted they would ask for an increase of 15% for NIH in funding for 1999. Insiders said that this 15% number has also been adopted by the Federation of American Societies for Experimental Biology. (See Science, Vol. 279, 9 Jan 1998, p 117).

- Clinton will ask for nearly 8% increase for NIH in 1999.
- But many biology lobby groups will likely ask for 15%.

NOTE: the budget outlook for US research (especially for medical research) appears to be very optimistic for 1999. Both political parties are competing with each other to get credit for giving more funds to this voting block. We note that November 1998 has an important off-year election.

(10% for NSF, 8.4% for Energy, 8.4% for NIH)

President Bill Clinton has requested a massive boost to biomedical and basic science funding during 1999. This is a two-page story with a long table of proposed spending numbers (Science, 6 Feb 1998). The NSF budget would increase by 10% to $3.77 billion (the research part by 11.8%). The Department of Energy would increase by 8.4% to $18 billion. The NIH (National Institute of Health) would increase by 8.4% to $14.8 billion. Total civilian R&D would increase by 8.4% to $37.8 billion. Total R&D would increase by 2.6% to $78.2 billion.
35. Mar 1998: Clinton proposes a budget bonanza for science, exceeding expectations and outdoing Congress (a headline).

Non-defense science would get $78.2 billion for FY99, a 5.8% increase—which is well above the present 2% rate of inflation. NSF would jump 10% to $3.8 billion and NIH would increase 8.1% to $14.2 billion.

By Christmas 1997, the White House concluded that the political appeal of higher R&D budgets was more credible because the economy was booming, giving record tax receipts. Federal tax revenues rose from 18.8% of GDP in 1995 to 19.8% in FY1997. Robert Reischauer was head of the Congressional Budget Office until last year. He said of the Clinton R&D budget: “It is politically strong and fiscally responsible.” (This was a 2-page story in Physics Today, March 1998, p 71-72)


The president’s proposed R&D budget request is the largest in five years, but there are obstacles in achieving it. First, Clinton will need Congress to increase discretionary spending above a cap that was set as part of the 1997 balanced budget agreement. Second, about $3.6 billion of the proposed increase needs to come from tobacco legislation, which is very contentious and political, and it may not work. There are six pages of stories about the science budget in the Spring 1998 Issues in Science and Technology, of the National Academy of Sciences.


Euphoria is contagious among scientists. The gloomy funding forecasts of three years ago have not come to pass. With the robust economy, all of the news in 1998 about funding for science has been very good.

But if the tobacco money fails (which it did), other funding sources for R&D increases, are neither easy nor obvious. The congressional bills to double support for science are helpful, but they are only statements of intent. Given the uncertainty, it would be wise for scientists to stop celebrating and start lobbying. More politicians and voters must be made to realize that R and D are vital. (See San Francisco Chronicle, June 10, 1998, p A19, by Al Teich—with AAAS)

---Stop celebrating and start lobbying---


This news report was a surprise to me. It was the first news that did not seem fully bullish about large increases in science funding for 1999.

President Clinton hosted a series of events last week that touted the importance of research, and to underscore the Administration’s plan for increased science spending in 1999. The article notes that much of the proposed increase in money for research depends on legislation that would extract money from the tobacco industry. So it gets complex.

The article adds: “Legislation that recommends doubling civilian R&D spending over the next 10 years has garnered little support in the Senate and faces opposition in the house.” A bill by Senator Phil Gramm to double spending by 2008 only has 11 co-sponsors, with 51 votes needed for passage. The sponsors are not pessimistic yet. The chair of the science committee in the House thinks that such a bill would be a mistake. He told science lobbyists on March 5, 1998: “My advice is to cool it. I can’t ask to give scientists more without saying what we would get for it. First we need a consensus on priorities.”


There are only 17 of 100 Senators who back a plan to double US research spending from $34 billion to $68 billion in ten years. It appears that this could not pass. Some senator and lobbyists are trying to get an alternative that would double funding in 12 years (Nature, 11 June 1998, P. 504).
40. **Summary of efforts for more R&D funds in the USA.**

See the above text for details.

- Jan 1997: Two science societies seek 7.1% increase for NSF (195,000 members).
- Mar 1997: 23 professional societies ask for 7% R&D increase (1,000,000 members).
- Oct 1997: Over 100 science and engineering societies ask to double civilian R&D spending over 10 years from $34 billion to $68 billion (these R&D groups represent three million people).
- Feb 1998: Clinton plans to give a 10% increase to NSF for FY 1999 and an 8.4% increase to NIH.
- Mar 1998: Clinton wants to give 10% to NSF and 8.1% to NIH.


The title of the editorial was "Think of a number and double it." The four US Societies say that the National Research Investment Act of 1998 (S1305) served as a rallying point for the whole science and engineering community. To say that S1305 simply carries the message "spend" is to miscast the role of the bill, they argue. The Act calls for a doubling of research spending in the US. (*Nature*, 25 Jun 98, p 727)

42. **Jul 1998: OMB head scolds scientists as unhelpful.**

The outlook for huge funding increases for science is decreasing. Except for popular agencies like NIH and NSF the outlook is not much better than before Clinton's proposal. Congress is beginning to argue that the nation's R&D may be moving too fast for its own good. Clinton's plan for 1999:

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<thead>
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<th>Increase from 1998</th>
<th>Amount for 1999</th>
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<tr>
<td>Civilian R&amp;D</td>
<td>$37.4 b</td>
<td>$1.8 b</td>
<td>5.1</td>
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<tr>
<td>Part for academic research</td>
<td>$14.5 b</td>
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Franklin Raines had been the head of the Federal Office of Management and Budget (OMB) until a month ago. He attacked the effort of the Senate to reduce the big increases in Clinton's budget. He also scolded scientists for not rallying immediate support for Clinton's proposals.

Then Raines posed five items of what scientists should do to help government policymakers and lawmakers raise their commitment to R&D:

- First, "How large a scientific enterprise does this nation need?" "More" money is not an adequate answer, he said. Wish lists do not fund programs. Strong justifications, tough choices, good performance, and aggressive follow-through until a funding law is enacted do fund programs.
- Second, how do we set our priorities in the nation's R&D enterprise?
- How can the success of federal programs be measured? "Productivity should not be a dirty word in science," said Raines.
- How can the government-university partnership be evaluated? The support is too often viewed as an entitlement. Are earmarks fair game? "Science itself is often a high-tech version of old-fashioned pork barrel policies."
- How can the American people be "engaged in the excitement and wonders of science?" The importance of research to the public is often unclear and unexplained.

There was a lot more discussion in the 2-page paper (*Physics Today*, July 1998, pp 46-47).
43. Aug 1998: *A reply to Raines about federal science priorities, etc.*

Werthamer notes that Raines posed five fundamental questions that have been asked repeatedly over at least the past 25 years. How much should the US spend on R&D? One criterion sets a floor: enough to train the necessary R&D scientists. We now spend much more than this. One sensible criterion would be to allocate a small, stable fraction of GNP.

How can we set priorities for R&D? He says the R&D community will not be much help in setting priorities because it is not able to ration itself. Werthamer was former Executive Secretary of the American Physical Society. He makes other useful comments in his letter (Science, 21 Aug 1998, pp 1145-46).


Because tobacco money will not be available to help fund R&D, it is harder to find money to pay for the large increases that have been planned. To help pay for the large increase ($1.2b) in the NIH budget, the Senate took $2b from the summer jobs programs and from energy subsidies for low-income families. Naturally, many people will fight this.

Congress could use surplus tax money from the good economy. However, the White House has said that surpluses should be used to help Social Security, and key Republicans favor tax cuts. One White House aide said "This is like a basketball game—it will all be decided in the last four minutes." (Science, 3 July 98, p 16).

45. Jun 1998: *Gingrich puts science second only to drug war.*

Gingrich is head of the US House of Representatives. This was a headline in Nature, 25 June 1998, p 726. An update: The Republicans did not do as well as hoped in the Nov 1998 elections, so Gingrich is leaving his job.

46. Jul 1998: *Comparisons of budgets for R&D between countries*

Science magazine had a "policy forum" paper in which they compared the money spent for R&D in 12 countries (The G7 and 5 others). The comparisons are given in percent of GDP. Plots are shown for 1981-1996 for both the total R&D in each country, and the amount that is paid for by the government.

The spending by the US is at the top or near the top. However, it has come down (in % of GDP) since 1987, which is probably a reflection of the decreasing amount being spent on defense R&D. There were a few surprises for me. From all that I had read, I thought that Japan emphasized high government spending for R&D and more government spending than in other countries. Instead of this, they are near the bottom of the comparisons in terms of government spending (about 0.5% of GDP compared with 0.9% in the US). However, the total R&D spending in Japan is near the top (about 2.75% of GDP), which is about the same as in the US. Total spending in Italy is about 1.2%, Canada 1.6%, UK 2%, Germany 2.3%, Australia 1.6%. (Science, 3 July 1998, p 49)

NOTE: An article is included later that shows that Finland has become a big spender on research. Total spending was 1.3% of GNP in 1983, 2.6% in 1996, and it will be 2.9% in 1999. Another article shows that spending in Poland was 1.5% of GNP for many years; now it is only 0.5%.


The grand budgetary finale of the 105th Congress last week was generous to many constituents, especially biomedical scientists. As well as giving billions in subsidies to highway projects and electric utilities, NIH received a record $2 billion raise (a 15% raise, to $15.65 billion!) This puts NIH on track to double the budget in five years. The Clinton Administration had requested an 8.7% increase for NIH; the House had suggested 9.1%, but Senator Specter (R-PA) wanted and got 15%. The news story notes that biomedical research leaders are delighted with what they have seen so far.
But how will all the spending be paid for? Earlier in the year there were tight budget limits, but Clinton thought he could get extra money from the tobacco deal. But that failed. Congress declared an emergency that allowed it to break the budget rules and add $21 billion of spending for a variety of projects. The White House was probably enthusiastic. The 2-page article gives information about science budgets in several agencies. The increases are NIH 15%, DOE science 8%, NSF 7%, NOAA 6%, etc.

The article says that science lobbyists are already positioning themselves for the next budget battles that will begin in Jan 1999. A congressional aide said that every scientific society is asking itself how it can achieve what the biomedical community did with NIH (a 15% raise). *(Science, 23 Oct 1998, pp 598-599.)*

**BACKGROUND:** Several major bills to fund the government had not been passed. A committee from Congress and the White House worked hard to resolve issues and develop one huge bill that was passed. People couldn’t really know what was in the bill when they voted for it.

**48. Oct 1998: Lobbyists elated as NIH wins $2bn budget increase.**

The 15% increase is the amount requested for NIH in Dec 1997 by the Federation of Societies for Experimental Biology (FASEB). Few members really expected to achieve this goal. *Nature, 22 Oct 98, p 734.*

Another article on page 31 said “Rallying call: Washington’s first annual cancer march last month demanded more cancer research.” The picture shows thousands of people in the gathering. The FASEB is also urged to work on professional issues for biomedical research as well as funding issues. In 1989, FASEB represented six societies with 26,000 members. Now it has 17 societies with 56,000 members (*Nature, 24 Sep 98, p 310*).

**49. Jan 1999: Life scientists seek 15 percent rise in NIH research funds.**

The Federation of American Societies for Experimental Biology (FASEB) is calling for a 15% increase in the budget of NIH for the year 2000. Note that they got a 15% raise last year for 1999.

The NIH budget is $15.6 billion in FY 1999. The FASEB represents 56,000 researchers in 17 life-science societies. They want another $2.3 billion added to the agency budget for FY 2000. This would keep things on track to double the NIH budget over the 5 years from 1998 to 2003.

The Federation also asked for a 15% increase in the NSF budget to bring it to $4.2 billion in the year 2000. It appears that the increases asked for by Clinton will be much smaller than these. *(Nature, 25 Jan 1999, p 284)*

**50. Jan 1999: Flat budgets keep space science on edge.**

The European space scientists have planned several large satellite missions through 2007. The space science budget was $407 million in 1998 and it will be $408 million in 1999. They wonder if they can do all of the planned missions if there is no budget increase for inflation (*Science, 1 Jan 1999, p 19*).

**51. Feb 1999: The 2000 budget for the US plays favorites.**

Computing initiative gets top billing and biomedical research gets short shrift in a very uncertain budget year. A few of the Clinton proposals for year 2000 are:

<table>
<thead>
<tr>
<th>Agency</th>
<th>FY 1999</th>
<th>2000</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIH</td>
<td>$15.65b</td>
<td>$15.97b</td>
<td>+2.1%</td>
</tr>
<tr>
<td>NSF</td>
<td>3.74b</td>
<td>3.95b</td>
<td>+5.8%</td>
</tr>
<tr>
<td>NASA</td>
<td>13.67b</td>
<td>13.58b</td>
<td>-0.7%</td>
</tr>
<tr>
<td>NOAA</td>
<td>2.26b</td>
<td>2.56b</td>
<td>+13.0%</td>
</tr>
<tr>
<td>USGS</td>
<td>798.0m</td>
<td>838.5m</td>
<td>+5.1%</td>
</tr>
<tr>
<td>Global Change</td>
<td>1.68b</td>
<td>1.78b</td>
<td>+6.2%</td>
</tr>
<tr>
<td>Total Defense R&amp;D</td>
<td>40.64b</td>
<td>38.48b</td>
<td>-5.3%</td>
</tr>
<tr>
<td>Total Civil R&amp;D</td>
<td>38.63b</td>
<td>39.76b</td>
<td>+3.0%</td>
</tr>
<tr>
<td>Total R&amp;D</td>
<td>$79.27b</td>
<td>$78.24b</td>
<td>-1.3%</td>
</tr>
</tbody>
</table>
NOTE: See the good 3-page article (*Science*, 5 Feb 1999, pp 778 – 780)

52. Feb 1999: Germany: *New Minister on a mission to modernize.*

53. Feb 1999: *Summary of Budget Requests for NIH.*

The budget outlook for NIH has been looking a lot more bullish in the past few months.

- Jan 1996: Surprise; Government gives NIH big increase. NIH gets 5.7% (Clinton had asked for 4.2% and the Senate 2.6%).
- Dec 1996: Lobbyists began pushing for a 6.5% increase for NIH in FY98 (as much as they think they might be able to get).
- Jan 1997: The Senate said: Double the NIH budget in 5 years.
- March 1997: Professional societies (23 of them) asked for 7% increase for R&D. Biomedics (NIH) did not sign on (they want 9%).
- Nov 1997: NIH gets 7.1% increase for FY98 (Oct 97 to Sep 98).
- Jan 1998: Clinton plans to ask for nearly 8% increase for 1999.
  — But many biology lobby groups will probably ask for 15%.
- Feb 1998: Clinton asked for an 8.4% increase for NIH for FY 1999.
- Feb 1999: The Clinton budget requests only a 2.1% increase for NIH.

54. Fall 1998: *Drive to double R&D spending gains*

The spotlight on the importance of research and development has intensified recently. In June 1998, Newt Gingrich called for a doubling in 8 years. Also in June 1998, two senators introduced a bipartisan bill to double civilian R&D funding in 12 years. This bill also asks the Academy of Sciences (NAS) to develop methods to evaluate R&D programs with federal funding.

55. Dec 1998: *Senators want more money for research*

A bipartisan group of 24 US senators wrote to President Clinton on Dec 11 expressing concerns about plans of the Office of Management & Budget (OMB). The senators pointed out that they had passed an act that would double research spending in 12 years. In early December, science lobbyists warned that OMB was considering very small increases next year (FY 2000) for science agencies because they had fared so well in this year's (FY 1999) budget.


56. Jan 1999: *Brazil brings in reforms of science funding agency*  
(or: How to organize science and technology funding)

Brazil’s science funding agency is being shaken up as part of broad government changes to coincide with President Cardoso’s second term. (We also note that the country has been in an economic crisis for several months.)

The independence from political interference of CNPq, which was crated in the late 1940’s, has always been prized by Brazilian scientists. When the science ministry was created in 1985, it took responsibility for CNPq, creating a source of friction.
The science ministry had three top officials, one each for (1) scientific development, (2) technological development, and (3) information technology.

Under the new reforms, these will be replaced by three new funding councils: (1) biomedical research, (2) humanities, and (3) physical sciences and engineering. Each of these posts will be filled by a working scientist. See Nature, 14 Jan 1999, p 93. Please read the half-page story.

MY NOTE: I am curious about what experiences and debates they had in Brazil when moving from the old structure to the new one. The new one might help. Note that work areas such as “technological development” and “information technology” were key focal points in the old organization. But if service functions become the bosses and control the money flow and the projects, then the projects often are not focused well on end goals. And they may not be focused on the needs of end users or of society as a whole.


Most of Corporate America waded through the legislative swamp of the 105th Congress and came away empty handed. But “Silicon Valley staggered under its bundle of victories” (more visas for foreign workers, ban on new internet taxes, curbs on class-action suits, etc.)

The tech industry is a relative newcomer to the Washington political game, but it “exploded onto the scene this year.” It gives donations about equally to Republicans and Democrats. Technology Network is a 15-month old political action group formed by big shots. The Tech Net president said they have a winning hand. That is because they “play poker with both parties.” They like GOP’s “mantra of smaller government and lower taxes.” They also like the “New Democrats message of fiscal responsibility and federal support for research and education.” The one-page article has more useful information. (Business Week, Nov 2, 1998, p 45.)

High tech likes federal support for research and education.

58. Jan 1999: IT lobby groups combine in D.C.

Two relatively new IT lobby groups announced a merger last week. Both were backed by Microsoft. This creates an organization with over 500 members (from ComputerWorld, Jan 25, 1999, p 29)


This story is not about science lobbying, but it is about one type of argument that is used in lobbying, in general.

The Fed Ex pilots may strike (right before Christmas) if their demands are not met. The dispute is over money. Fed Ex is offering the 3,500 pilots a 17% raise over four years. The pilots want 24% in three years, similar to what their competitive parcel delivery workers in UPS won last year. The union vice-president said they will step up the pressure until they get a good settlement. The $13b Fed Ex could give in because the pilot pay is less than 10% of the company’s $5.8 billion total labor bill. But then, the other 128,000 US employees would surely organize to demand more money.

We note that the pilots are not comparing their pay to other groups of pilots that are worse off than they are. It is a little like science lobbying. NIH got a pot of gold delivered by the good fairy (a 15% increase for 1999); now it is anticipated that the other science disciplines will work hard to attain similar riches.

60. Nov 1995: Subsidized place at the trough (Lobby)

This news story was in Forbes. It said that Congress should limit groups that receive federal funds on how much they can spend to lobby Washington for more money. Legislation proposed to do this may be blocked by — you guessed it — fierce lobbying from the affected parties.
Thousands of organizations such as AARP (retired people) that receive federal funds, also spend considerable funds to lobby congress to spend more money. Under current law, government grants are not supposed to be used for political purposes, but people can always claim that their money for lobbying came from non-grant sources. Forbes adds, “Why should taxpayers pay for groups to badger Congress for more taxpayer money?” See the short news story: Forbes, Nov 20, 1995, p 24.

61. Aug 1998: **UK Science funding increase.**

Tony Blair, the Prime Minister of the UK wrote this editorial in Science magazine. He noted that when his government was elected 15 months ago, he promised to modernize Britain and equip it for the next century. (Science, 21 Aug 98, p 1141) It is interesting that a prime minister would take time to write an editorial to Science.

62. Dec 1998: **CNRS Researchers take up the fight against Allegre’s reforms.**

The reform bandwagon began rolling 2 months ago. CNRS scientists want a national debate on the issue and Allegre has refused. The CNRS national committee of 800 scientists from all over the country (40 scientific sections) met in Paris to confront the reform proposals head-on. The Allegre plan wants closer ties between CNRS, the universities and industry. About 90% of CNRS labs are already associated with universities and other research partners.

. . . . Other speakers took a harsh line, warning against tying the CNRS too tightly to the universities. A Nobel winner compared the centralized but research-weak French university system unfavorably with that of the United States’. “To do university research the way it is done in the US is illusory,” he said. “French universities don’t have real autonomy and the teaching load is too heavy.”

Underlying the protest are years of frustration with the conditions of doing research in France, including poor budgets. The total economy of France has moved from 100 in 1985 to 188 in Jan 1999; the CNRS research (not including salaries) has gone from index 100 to 120 in the same time. We are not told what happened to salaries. Please read the 1.5 page news article (Science, 18 Dec 1998, pp 2162-2163)

63. Jan 1999: **French reforms would disrupt research.**

(The big science labs would be changed.)

The French Scientific Community is very worried about a proposed government decree about the Centre for Nation Research, Scientific (CNRS). The CNRS directors and scientific committees were not consulted. Even in the best cases, the proposal will break up CNRS, ending its involvement in formulating research policy. The CNRS would become a funding agency ruled by the short-term political aims of the government.

The government thinks that the break up of CNRS will help French Universities by giving them the principal responsibility for scientific research. Comparisons are made with the US, UK, and Germany that have institutes such as the National Institute of Health (NIH) in the US. The author says “Belgium and Italy have experimented with proposals similar to those of Allegre and we all know how catastrophic this has been. Interference by the state in planning and recruitment has nearly destroyed the research community.” This was correspondence from a president of a CNRS discipline area committee (In Nature, 14 Jan 1999, p 101)

64. Jan 1997: **German politicians break research pledge.**


The heads of Germany’s leading research organizations last week accused politicians of breaking a commitment to protect research from the pressures caused by a bad economy. They said that neither the economic recession, nor the costs of achieving a unified European currency can justify reducing investment in education and research, which are essential for economic recovery.
   (Science, 24 January 1997, p 475)

Berlin: In a highly unusual appeal, leaders of five of Germany's premier scientific organizations issued a dire public statement about the future of German research. The science leaders say the cuts by industry and the state governments have been more drastic than the reductions in the federal budget. German industry has cut nearly 40,000 R&D position in recent years. Nearly 60% of all R&D funds come from German Industry.

The German R&D has decreased to 2.2% of GDP. They said that Germany must increase this to nearly 3% to secure a leading place among industrial nations. Some of these nations now spend over 2.6% of GDP. One German national agency got a budget cut of 3.7%. Two others got increases of 5% from the government.

66. Jan 1997: Canada's Crisis: Can business rescue science?
   (See editorial in Science, 10 January 1997, p 139)

Canada has had large problems with budget deficits and a very high national debt (my comment). To reduce the national deficit, Canada's federal government has slashed the budgets of its science councils. Adjusted for inflation, the loss is 25% over 4 years.


The Canadian government has moved to restore three years worth of funding cuts to the country's three-research granting councils. The increases were part of the new 1998 budget announced last week.

- Natural Sciences & Engineering Research Council 13.8% US $346 Million
- Medical Research Council (MRC) 12.1% US $187 Million
- Social Science & Humanities Research (SSHRC) 7.4% US $71 Million


68. Aug 1998: Spending spree propels Finland towards top of research league

News from Helsinki: Finland is on target to meet its goal of a research funding level of 2.9% of GNP by 1999. Both the public and private sources of research funds have increased at a rate envied by its European neighbors. The spending has increased from 1.3% of GNP in 1983 to 2.6% in 1996 and will be 2.9% in 1999. The article notes that the research program seems to be using the new money efficiently. (Nature, 27 Aug 1998, p 820)

69. Aug 1993: Fight for resources spells trouble for Polish institutes.

A chart shows spending on science in Poland (percent of GNP) for 1974-1993. It was about 1.5% of GNP for many years, but it has dropped to about 0.5% of GNP. (Nature, 26 Aug 1993, p 748)

70. Jun 1993: China's science budget outgrows economy.
   (Nature, 17 June 1993, p 570)

China will increase its spending on science by more than 10% this year, because this could contribute to the national economy. China will allocate 20 billion yuan (US $3.5 billion) for Science and Technology and 60 billion yuan for education.

The increased budget is welcome, but an official in China's National Natural Science Foundation (China's main source of funds for basic science) says that an increase in his budget of 20% per year over the next three years still will not satisfy demand. A recent forced plan, re-aligned 70% of the scientific staff in the Chinese Academy of Sciences toward applied research. This did not make scientists happy.
71. Jun 1997: China aims to boost science funding.
(Nature, 12 June 1997, p 646)

The state Science and Technology Commission has promised to increase next year's science development budget by 14.2%.

72. Science in SE Asia.

An 18-page report in Science (6 March 1998) describes science in Indonesia, Malaysia, Thailand, and the Philippines. Most of the data are probably valid about 1997.

<table>
<thead>
<tr>
<th>Country</th>
<th>Population in 1994</th>
<th>GDP per person (US$, PPP)</th>
<th>% GDP on research</th>
<th>R&amp;D Workers per million population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>200.41 million</td>
<td>$3900</td>
<td>0.17%</td>
<td>320</td>
</tr>
<tr>
<td>Malaysia</td>
<td>19.28 million</td>
<td>$9000</td>
<td>0.37%</td>
<td>590</td>
</tr>
<tr>
<td>Thailand</td>
<td>59.51 million</td>
<td>$2800</td>
<td>0.22%</td>
<td>330</td>
</tr>
<tr>
<td>Philippines</td>
<td>69.81 million</td>
<td>$7800</td>
<td>0.20%</td>
<td>480</td>
</tr>
<tr>
<td>Taiwan</td>
<td>21.30 million</td>
<td></td>
<td></td>
<td>2070</td>
</tr>
</tbody>
</table>

Taiwan: a white paper calls for an increase in R&D spending to 2.5% of GDP by year 2000 and 3.0% by 2010, with 40% of the funds coming from public funds. At least 15% of the total would go toward basic research. Basic research had flat funding in 1995 and 1996, a 15% increase in 1997, and will probably get 10% in 1998. The report calls for the researcher population to grow from 45,000 in 1997 to 75,000 by 2010 (Physics Today, Mar 1998, p 78)

73. Aug 1998: Korean Science and Technology

The Minister of Science and Technology of South Korea wrote an editorial for Science magazine. He noted that Korea is now experiencing severe economic hardship. He says that the key to fixing the economy is to have a strong capability in science and technology. Korea is estimated to have 150,000 available researchers and is second only to the USA in the numbers of college graduates per unit of population. The government investments in R&D are 3.7% of the total government budget and are planned to increase to 5% by year 2002. (Science, 7 Aug 1998, p 781)

74. Russian funding for science.

a. September 1993: Russian science gets caught up in struggles over political reform.
(Nature, 23 Sep 1993, p 283)

b. March 1995: Russia links higher science funding to structural reforms.

The Minister of Science and Technology Policy said that the government has cut funding for science by 80% over the past four years, leading to a drop of one-third in the number of scientists employed (Nature, 9 March 1995, p 105).


Russia is having bad economic and budget problems.

There are plans for the science budget to drop from Rubl 11.2 billion ($1.8 billion US) to Rubl 8.2 billion. So there are strong protests. Under the plans, funding for science would drop to 0.23% of GNP in year
2001, compared with 0.33% in 1997. Also, the research institutes are told that their top priority has to be to pay their electricity costs and related bills. *(Nature, 11 June 1998, p 501).*

75. **Jun 1998: Russian miners add weight to protests by scientists.**

Researchers from the Academy of Sciences held a mass protest march in Moscow to complain about further deterioration in their working conditions. An earlier decision reduced science budgets for next year by 27%. Now it has been decided that science will get only two-thirds of the reduced amount because of the country’s worsening economic situation. *(Nature, 25 Jun 1998, p 721)*

**NOTE:** Many groups in Russia are not getting much support. The Russian economy is not good. *(And in Aug-Sep 1998, there was a financial and leadership crisis.)*

76. **Some information about the Japanese economy.**

The Japanese economy has had some problems and low growth rates during 1991-1997.

a. **May 1997: Japan: War on debt puts big science under fire.**

*(Science, 2 May 1997, p 670)*

Compared to five years ago, it will be very difficult to launch new science projects in Japan. Few dispute the need for fiscal reforms. As a proportion of domestic product (GDP), Japan's debt is among the highest of all the industrial countries. It was incurred in an effort to revive the sluggish economy.

b. **June 1997: Things not as rosy for Japanese science budgets.**

The Japanese economy did not do well during about 1990-1996. Therefore, the government started a lot of extra spending to stimulate the economy. The national debt became very high. Consider the quote: "The extra time (to deregulate finance), and revenue from the tax hikes would enable the Ministry of Finance to start repairing the budget, which was ravaged by $531 billion in road work, rural irrigation projects, and other wasteful measures designed to keep the economy afloat." *(Business Week, 23 June 1997, p 56)*

In June 1996, Japan had a plan to increase science funding by 50% by 2001 *(Nature, p 725, 1996)*. In the US, this has often been called a doubling. These plans are now doubtful. *(Nature, 12 June 1997, p 643) (Science, 13 June 1997)*.

c. **August 1997: The organization of Science in Japan.**


There will be a stronger Council for Science and Technology in the government. The bad news is that it is the Science & Technology Agency (STA) within the Ministry of Education, Science, Sports and Culture (called Monbusho). The prime concern of Monbusho has always been education and not research in the University system. So it looks like the voice for science in Japan is being weakened.

d. **Small increase in Japanese science budgets (Sep 1997).**

Summary: Japanese federal research spending is increased by 1.9% for 1998.

Japanese science agencies are asking for modest budget increases next year because they know that the finance ministry will no longer support the sharp rises in funds given in recent years.

<table>
<thead>
<tr>
<th>Total R&amp;D Budgets</th>
<th>Want for 1998</th>
<th>% Increase</th>
<th>Actual %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Science and Technology Agency (STA)</td>
<td>745.0</td>
<td>+1.4%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>2. Ministry for Health &amp; Welfare (MHW)</td>
<td>92.3</td>
<td>+1%</td>
<td>~5.1%</td>
</tr>
<tr>
<td>3. Ministry Intl. Trade &amp; Industry (MITI)</td>
<td>499.2</td>
<td>+5.7%</td>
<td>+4.3%</td>
</tr>
</tbody>
</table>

*(See Nature, 389, p. 4, 4 Sep 1997)*

*(See Nature, 391, p. 111, 8 Jan 1998)*
Note: the total Federal research funds for 1997 (1319.2 bil yen) were increased by 24.5 billion yen (1.9%) to 1343.7 bil yen for 1998. The total is 1.7% of the total budget of 77,670 bil yen for 1998. The table above is a little off, because some functions have been reorganized. See the Jan 8, 1998 Nature.

Last year, the government called for an increase in the budget for science and technology of more than 50% over the following five years. The smaller requested increases for next year are a departure from the plan (Japan needs to control its overall budget and its debt). The actual increase for Japan S & T for 1998 is 1.9%.

e. December 17, 1997: Bold tax-cut promise sends Japan’s stock soaring (by 556 points to 16541).

The surprise tax plan in Japan (cut of $15.38 billion taxes) was designed to “stop this avalanche of low confidence in the Japanese financial system.” The Prime Minister said, “we can’t trigger a worldwide depression beginning in Japan” (Denver Post, Dec 18, 1997). On December 18, the market dropped 379 points to 16162.

This action was probably needed to grow the economy and avoid panic, but it may put more pressure on government financing and debt.

f. Japanese stocks plummet 5.7% on December 19, 1997.

The big Asian financial problems in fall 1997 have also affected Japan. The Japanese stock index (Nikkei 225) was at about 20,000 during July 1997, and about 16,200 during Nov-Dec 1997. This was a decrease in value of 19% over a 5-month period. On December 19, the stocks fell 5.7% (down 924 points to 15238) when a large firm failed and there were various economic fears (Wall St. Journal, 19 Dec 1997, G-16).

The growth of the Japanese economy has been as follows:

<table>
<thead>
<tr>
<th>Years</th>
<th>Real GDP Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955-73</td>
<td>10% per year</td>
</tr>
<tr>
<td>1973-91</td>
<td>4%</td>
</tr>
<tr>
<td>1991-96</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

g. September 1998: Japan: Bad economy is good news for R&D.

The Japanese economy has been in bad shape, so the government has another plan to spend $71 billion to try to boost the economy. And R&D will get a portion of the money. However, the requests by the R&D people will offer no relief for existing scientific facilities that have been forced to reduce operating expenses to shrink a large budget deficit in Japan (Science, 1 May 1998, p 669). While ministries have been told to cut spending, politicians have looked for ways to stimulate the economy and reward constituents.

Japan’s overall R&D spending seems certain to rise from its present level of $25.7 billion. Some worry that the supplemental packages are distorting activities by emphasizing applied fields over basic science, and hardware over actual research. (Science, 11 Sep 1998, p 1587)

h. The stock market in Japan.

- The value in January 1987 was 20,000.
- The value in December 1989 peaked at 38,000. Then it gradually dropped.
- The value during February 1992-January 1998 (7 years) has usually been about 19,000 (main range 15,000 to 21,000).

Note: the fall in stock values and in land values (both were too high) has led to a period of slow growth in Japan.

77. Debt of selected Countries (general government debt).

During 1985-97, many of the rich countries have been running up their debt. This leads to high interest payments for the government, a lack of flexibility to handle recessions, and they become very vulnerable to higher interest rates. Now many governments are trying to control their debts. See Table 1. The poor growth of GDP in Japan (1991-97) has led to attempts to pump prime the economy with extra federal spending. This leads to rapid debt increases.

Table 1. Government debt as percent of GDP.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. USA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net debt</td>
<td>35.4%</td>
<td>46.7</td>
<td>52.0</td>
<td>53.7</td>
<td>50.1</td>
<td>46.7</td>
</tr>
<tr>
<td>Gross debt</td>
<td>49.4</td>
<td>62.1</td>
<td>66.4</td>
<td>66.0</td>
<td>62.4</td>
<td>58.3</td>
</tr>
<tr>
<td>b. Japan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net debt</td>
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Source:
### SUMMARY OF RESEARCH AND DEVELOPMENT IN THE PRESIDENT’S FY 1998 BUDGET
(budget authority in millions of dollars)

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**Total R&D**

| | 71,339 | 73,821 | 75,469 | 2.2% |

- Defense R&D*
- Nondefense R&D*
- Basic Research
- Applied Research
- Development
- R&D Facilities*
- R&D at Colleges and Universities

Source: AAAS, based on Office of Management and Budget data for R&D for FY 1998 and agency budget justifications.

*DOE figures include proposed up-front funding for fixed assets.

The research portions of budgets in FY 1998. NIF, which is part of DOE's defense R&D effort in inertial confinement fusion, is scheduled to be completed in 2003.

The president's DOE budget would also increase funding for several programs that came under attack in the 104th Congress, including Solar and Renewable Energy, Nuclear Energy, and Energy Conservation.

**Department of Agriculture (USDA).** R&D would fall by 3.9 percent to a $1.5 billion because of cuts in R&D facilities, most of them congressionally designated in last year's appropriation. R&D in USDA labs and extramural research grants would increase. The president has proposed a 38 percent increase to $130 million for competitively awarded National Research Initiative grants.

**Department of Commerce.**

The R&D budget would rise 6.2 percent to $1.1 billion. Of that, $600 million would go to the National Oceanic and Atmospheric Administration for research on oceans, atmosphere, climate change, and marine resources.

The National Institute for Standards and Technology's (NIST's) Advanced Technology Program, which funds commercially oriented technologies and has been opposed by the Republican majority in Congress, would get an increase to $275.6 million from $225 million. NIST's labs would get a 3.3 percent increase to $276.8 million for their work on technical standards and measurement technologies. The budget for NIST's Manufacturing Extension Partnership (not classified as R&D) would jump from $95 million to $123.4 million.