unanimous consent that the clerk read the titles of the bills for a second time en bloc.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered. The clerk will report.

The legislative clerk reads as follows: A bill (S. 2370) to amend the Internal Revenue Code of 1986 to permanently extend the marriage penalty relief provided under the Economic Growth and Tax Relief Reconciliation Act of 2001. A bill (S. 2370) to amend the Fair Labor Standards Act of 1938 to provide for an increase in the Federal minimum wage, and for other purposes.

Mr. MCCONNELL. I object to further proceeding en bloc.

The ACTING PRESIDENT pro tempore. Objection is heard. The bills will proceed en bloc.

January the Department of Defense re-
pore. Without objection, it is so ordered.

Mr. BINGAMAN. Mr. President, there are a couple of news events in the last 24 hours or 48 hours that I thought deserved some comment.

Let me first talk a moment about the atrocities and abuse of enemy combatants—prisoners—in Iraq which has been a major concern. Many of my colleagues have commented upon the horrific images that have come out on television and in the papers. I have not seen as yet many comments about the Pentagon’s response. That is what I wanted to comment on briefly.

Officials within the Department of Defense have known at least since January that prisoners held as enemy combatants have been subject to maltreatment, and to physical and sexual abuse. We know this because in January the Department of Defense re-

The simple fact is, the world has become a highly competitive place with regard to science and technology leadership and talent and investments. We have historically believed we were the leaders in the world in this arena, and we have taken for granted the fact that promising young scientists and engineers from other countries would all want to come here, to stay here, and contribute to our continued world leadership. All of that is now in danger of changing.

We ignore this challenge to our long-term economic security at our own peril. This challenge requires strong efforts by our Government and our industry to counter the strong efforts that are being made in other countries, and to match the strong efforts that are being made in other countries in this field.

So what needs to be done? Let me list briefly six areas on which I think we ought to take aggressive action. The first area relates to research frontiers. We need to start by focusing on broad support for basic science and engineering research across the board, as well as -
as on targeted investments in critical emerging technologies that will drive future job growth and economic growth in this economy.

Unfortunately, in terms of broad-based basic research support, we have a pattern of underfunding across the physical sciences and engineering, and that is in comparison particularly to what we have been doing in biological and life sciences for several years. I do not advocate reducing our commitment to the biological and life sciences, but I stress a commitment to maintaining some of that leadership in the physical sciences and engineering.

In terms of targeted research and development, there are many areas where there are promising developments that we should be paying attention to. Let me cite three examples. One is high-end computing. Japan today is the world leader in high-end computing with their Earth Simulator supercomputer. That is a sad statement to make on this Senate floor.

The ACTING PRESIDENT pro tempore. The Senator's time has expired.

Mr. BINGAMAN. Mr. President, I ask unanimous consent that I be permitted to continue for another 5 minutes.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

Mr. BINGAMAN. That is a sad statement because I can remember a decade ago when the United States was an unrivaled leader in high-end computing. We need to do much better in this field.

Senator LAMAR ALEXANDER and I have introduced the High-End Computing Revitalization Act. I hope that the leadership in the Senate will see fit to move this legislation this year, and that we will receive strong support from our colleagues.

Nanotechnology is another area. Although Congress passed a nanotechnology bill last year, and the President signed the bill with great fanfare, the truth is, we are not putting the needed funding into it. The administration has not requested sufficient funding. We are not committing the money. This is another major shortfall.

The next specific area I believe we need to target is next-generation lighting. I have spoken several times about that on the Senate floor. Semiconductor lighting has the promise to greatly increase the efficiency of lighting devices and also to create an enormous number of jobs. The estimate is this will be a $12 billion per year industry for these devices in the future. The question is, when will the leadership in developing these devices? Will we maintain some of that leadership in this country? And where will the high-wage jobs be created by this? I hope those jobs will be created in the United States, but Congress needs to act to ensure this.

A second area deals with the training of scientists and engineers. An enormous amount needs to be done to better prepare our own students for careers in these fields. We do too little in those areas. We need to do better. We now have the added concern that the foreign students who have traditionally come here to study are, first, finding visa problems that keep them from completing their studies, and second, deciding not to stay once they complete their education but go back to their home country. This is a precursor to the shifting of more and more research and development activity out of this country and into other countries around the world, which I think is a very bad trend for our economic future.

The third area is infrastructure. The National Science Foundation estimates there are roughly $10 billion of unfilled needs for science and engineering facilities at universities. Unfortunately, the system we have in Congress today to fund these needs is through random, uncoordinated earmarks to appropriations bills. This is totally unacceptable. We need a merit-oriented solution that involves a look at the merits of the request and the need, and also the commitment that State and local governments are willing to make to creating this infrastructure.

The fourth area is finance. We need public policies and strategies to expand the pool of risk capital for entrepreneurial investment.

A fifth strategy is public-private sector interactions. We need to fully fund the Advanced Technology Program and the Manufacturing Extension Partnerships. The administration's request that we zero-fund the Advanced Technology Program is totally wrong-headed, in my view, and clearly needs to be rejected by this Congress. We should have the Federal Government take a stronger role in supporting science parks and incubators around this country as well.

The final area I would mention is education. We need to recognize the strategic importance of legal or regulatory structures to high-technology industries. We need to increase the efforts to protect intellectual property, to support fair competition regimes, to enforce legitimacy and transparency in the global market system, and to assure access by U.S. companies to these markets.

We need to spend some time better monitoring and being sure we are getting fair treatment under the trade agreements we have already entered into instead of rushing forward pell-mell trying to find new agreements we can sign.

We need to focus on export promotion. There is way too little attention to export promotion.

We need to focus on assistance programs for those people who are displaced and those communities that are damaged by increased trade. The current administration and, unfortunately, the Congress in the last few years have not done what needed to be done in this area. We have no formal science and technology policy. The administration has undermanded and seemingly neglected the Office of Science and Technology Policy.

In previous remarks to the Senate, I have gone through a list of the proposed cuts by this administration to basic and applied research in the Department of Defense, the Department of Energy, the Agriculture Department, in the transportation sector, the Department of Energy's Office of Science, the Advanced Technology Program in the Department of Commerce. These include:

- $660 million in cuts proposed for basic and applied research at the Department of Defense, the sort of research that has the greatest potential for dual use and effective spin-off to the civilian high-technology industries;
- $63 million in cuts for energy conservation R&D at the Department of Energy;
- $139 million in cuts for FY 2005 for agricultural research;
- $24 million in cuts for transportation research; and
- $68 million in cuts for the Department of Energy's Office of Science, a major supporter of basic physical sciences and engineering research—we have 40 Democratic Senators and 15 Republicans on a letter asking for increased funding rather than cuts here—and;

Total elimination of the Advanced Technology Program at the Department of Commerce, a loss of $171 million for new technologies that otherwise would have been enabled and brought to commercial reality. This is a highly successful program praised by the national academies and even the President's own budget language, cut for short-sighted ideological reasons.

For the sake of our future national competitiveness, we need to face up to the challenges and technological revolutions of the 21st century and ensure that the United States has an effective plan for taking them on. It would be my hope that the coming Presidential election will serve as an opportunity to reflect on the inevitability of which we are currently addressing these issues, and to put forth the case that we need a comprehensive change in our policies to ensure our future competitiveness.

I yield the floor.

EXHIBIT 1
U.S. IS LOSING ITS DOMINANCE IN THE SCIENCES
(By William J. Broad)

The United States has started to lose its worldwide dominance in critical areas of science and innovation, according to federal and private experts who point to strong evidence like prizes awarded to Americans and the number of papers in major professional journals.

Foreign advances in basic science now often rival or even exceed America's, apparently with little public awareness of the trend or its implications for jobs, industry, national security or the vigor of the nation's intellectual and cultural life.

"The rest of the world is catching up," said John E. Jankowski, a senior analyst at the
National Science Foundation, the federal agency that tracks science trends. “Science excellence is no longer the domain of just the U.S.”

Even analysts worried by the trend concede that an expansion of the world’s brain trust, with new approaches, could invigorate the field. More sources of energy at the disposal of the world, environmental problems. But profits from the breakthroughs are likely to stay overseas, with competition for things like hiring scientific talent and getting space to showcase its work in top journals.

One area of international competition involves patents. Americans still win large numbers of them, but the percentage is falling as foreigners, especially Asians, have become more active and in some fields have seized the innovation lead. The United States’ share of its own industrial patents has fallen steeply over the decades and now stands at 52 percent.

A more concrete decline can be seen in published research. Physical Review, a series of top journals in physics, announced a 5 percent drop in the number of papers in two decades, fall from the most to a minority. Last year the total was just 29 percent, down from a third.

China, said Martin Blume, the journals’ editor, has surged ahead by submitting more than 100,000 papers a year. Other scientific publishers say they are seeing the same time of thing,” he added.

Another downturn centers on the Nobel Prizes, an icon of scientific excellence. Traditionally, the United States, powered by heavy federal investments in basic research, the kind that pursue fundamental questions of nature, have won the awards.

But the American share, after peaking from the 1960’s through the 1990’s, has fallen in the 2000’s by about half, 51 percent. The rest went to Brazil, Indonesia, India, Germany, Sweden, Switzerland and New Zealand.

“We are in a new world, and it’s increasingly going to be dominated by countries other than the United States,” Denis Simon, a dean of management and technology at the Rensselaer Polytechnic Institute, said at a scientific meeting in Washington.

Europe and Asia are ascendant, analysts say, even if their achievements go unnoticed in the United States. For example, in March, for example, European scientists announced that one of their planetary probes had detected methane in the atmosphere of Mars—a possible sign that aliens might live on the planet. The finding made headlines from Paris to Melbourne. But most Americans, bombarded with images from America’s own rovers successfully exploring the red planet, missed the foreign news.

More aggressively, Europe is seeking to dominate particle physics by building the world’s most powerful atom smasher, set for its debut in 2007. Its circular tunnel is 17 miles around.

Scientists say Asia’s push for excellence promises to be even more challenging.

“It’s unbelievable,” Diana Hicks, chairwoman of the United States government’s advisory body to the federal government.

By 2003, the nation’s top science and technology professionals start their own businesses with what they have learned from American companies.

For the United States, future trends look challenging, many scientists say. In a report last month, the American Association for the Advancement of Science said the Bush administration, to live up to its pledge to halve the nation’s budget deficit in the next five years, would cut research financing at 21 of 24 Federal agencies—all that do or finance science except those involved in space and national and domestic security.

More troubling to some experts is the like-ly trend of an acceleration of innovation by scientists. Applications from foreign graduate students to research universities are down by a quarter, experts say, partly because of the Federal government’s tighter renewal of visas after the 2001 terrorist attacks.

Shirley Ann Jackson, president of the American Association for the Advancement of Science, told the Congress that the decline in foreign students, the apparently declining interest of young Americans in science careers and the aging of the technically skilled labor force were generating a perilous combination of developments.

“Who,” she asked, “will do the science of the future?”

Several private groups, including the Council on Competitiveness, an organization...
in Washington that seeks policies to promote industrial vigor, have begun to agitate for wide debate and action.

"Many other countries have realized that science is key to our world's growth and prosperity," said Jennifer Bond, the council's vice president for international affairs. "They're catching up to us," she said, warning Americans not to "rest on our laurels."

REMARKS OF SENATE DEMOCRATIC LEADER TOWNLEY ON THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Thank you, Dr. [Shirley] Jackson, for that warm introduction, and for the tremendous work you are doing. Few people alive today can claim the numerous achievements that both of you have achieved in your own right. We have spent the prime of our lives procuring the precious blessing of liberty. Let [young men] spend theirs in shewing that it is the great parent of liberty.”

It was this idea to the American experiment, that the very first coin minted in our country bore the motto, Liberty, Parent of Science and Industry.

When Jefferson sent Merriweather Lewis across the continent to map the land that held our nation’s future, he understood the implications of what he was building. It would serve practical purposes such as easing the westward expansion of the nation and creating new trade relationships with the Indian populations. At the same time, the expedition captured Jefferson’s scientific heart. In fact, his first choice to lead the expedition was a French botanist. Jefferson changed his mind after meeting Lewis, an education in botany, geology, geography, and the finer points of navigation, he gave the Lewis a broad and simple directive: explore. When Lewis and his men brought back represented immense steps forward for American science from anthropology to zoology and many in between.

In many was leadership and the Lewis & Clark expedition established the model for government’s partnerships with science. And in the 210 years since, government support for scientific research has helped invent the telegraph, split the atom, conquer space, create the Internet, map the human genome. None of this would have been possible without the contributions of Americans scientists.

Regardless, rather than strengthening this partnership, I fear that the Bush Administration has allowed it to decline for critical reasons. First, the Administration is abdicating its responsibility to provide scientists with the funding cutting-edge research depends on. As you know, this government has seen its R&D investments steadily decline as a share of the U.S. economy, bringing the federal investment down to levels not seen since the mid-40s. Public-sector investments in advanced research have declined sharply, relative to our economic growth rate, and barely kept pace with inflation. The Bush administration’s failure to keep R&D investments at their pre-2001 level is set to increase 4.7 percent. However, the entire increase would go to the Department of Defense and Homeland Security for the development of weapons systems and counterterrorism technology. Make no mistake, these are necessary investments that will make our nation safer. But the remaining federal R&D budget that supports research into health, environmental, biological, and other sciences, will all see funding reduced.

In my home state of South Dakota, for instance, the Earth Resource Observation System is facing the possibility of deep cuts in staff due to cuts to their budget. Their work helps us become more responsible stewards of the land. The yields of farmers all over the world. And yet, this work is endangered due to draconian budget cuts.

But the administration’s disregard for science extends beyond budgetary choices. Just last month, the Union of Concerned Scientists released a report charging the White House with systematically working against the spirit of objective science. The report states that the Bush Administration has suppressed or distorted the scientific analyses of federal agencies, and these results are in line with administration policy. Time and time again, the Administration is choosing politics over real science.

Consider the administration’s response to global warming. Even though the scientific community is united on the fact that fossil fuel production and consumption has contributed to global warming, the White House deleted that finding from its 2001 report on Global Warming, and in its place inserted a reference to an opposing study that was funded by the American Petroleum Institute.

In addition, when the administration has had the opportunity, it has stacked the deck by paying research to advisory councils with under-qualified researchers who have shown allegiance to the White House’s political goals. Just recently, the President dismissed two advisers from his Council on Bioethics because they were outspoken proponents of research on human embryos.

This is not real science. This is vending machine science. The administration thinks it can pull a lever and get the results it wants at no cost. But the costs are extraordinary. If history shows anything, it’s that a bet against science is a bet you cannot win. For the sake of short-term political posturing, the White House is putting the long-term security, health, and prosperity of our nation at risk.

Just as importantly, America’s reputation as a home for cutting edge science is being sullied. We are losing friends in the science community that they are concerned about the support and reception their work will receive in the years to come. They worry that the administration’s failure to provide intellectual leadership will erode the high standing American partnership that created America’s dominant position within the world of science.
science has achieved since WWII. And I fear their apprehension is well justified.

But we should be honest with ourselves. Outside the scientific community, there is no huge, coherent government commitment to R&D. There is no widespread public outrage when the administration dislegates the unequivocal judgment of the scientific community that the critical ap­
gap growing between the United States and other developed nations will become a major issue in the upcoming Presidential campaign.

This represents a failure on our part. We have not done enough to show the American people just how much is at stake between the two frontiers, the two under­way in your laboratories and the problems that affect their lives. This must change. The stakes simply could not be higher.

We need to get back to our roots because America’s scientists were not given the tools they need to discover new an­swers to old questions? When rumors of a Nazi bomb program reached President Reo­sevelt, he said simply, “Whatever the enemy may be planning, American science will be equal to the challenge.” Will future presi­dents be able to speak with such confidence?

The challenge to the American scientific community is to rebuild the link not only between science and government, but between science and society. I believe we do so, if we return to the model established by Thomas Jefferson. There is an implicit ongoing debate within the government regard­ing the proper role of research is most impor­tant to support. Some suggest that we should put no limits on the kind of research we support and have faith that advances in theoretical science, regardless of the end use, will inevitably translate into practical applications that improve human life.

Others, I think, are too abstract. There are real problems, and to spend tax­payer dollars on anything but the most prag­matic search for solutions seems high-minded, but na­ive. There is merit to each ap­proach. Both kinds of research are critical.

But Jefferson offered a third way, and, I believe, the right way to make the best use of government’s resources, and gain the full support of the American People for the ef­forts of science. Meriwether Lewis’s expedi­tion represented a basic attempt to enlarge the scope of what the mind could do so. If we return to the model established by Thomas Jefferson. There is an implicit ongoing debate within the government regard­ing the proper role of research is most impor­tant to support. Some suggest that we should put no limits on the kind of research we support and have faith that advances in theoretical science, regardless of the end use, will inevitably translate into practical applications that improve human life.

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