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**Remarks of Senate Democratic Leader Tom Daschle
To 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 to have done as much to advance both the cause, and the frontiers of science.

It is a great honor for me to address such a distinguished group of scientists and thinkers. Since my childhood, I've been fascinated with science, perhaps because I knew my father had hoped to become a geologist before World War II called. But any child of South Dakota grows up with an appreciation for the impact science has on our lives. Whether it's the work of agricultural geneticists improving crop yields, or simply paleontologists explaining the fossils of Rapid City's Dinosaur Park, science has a special place in South Dakota. I chose a different path than a life of science, but I've always been mindful of John Adams's letter to his wife, Abigail, in which he wrote, "I must study politics and war [so] that my sons may have liberty to study mathematics and philosophy." Sooner or later, every elected official needs to come up with a justification for the demands of public office to their husband or wife. I wish I could come up with something as good as John Adams.

Whatever Adams motivation was for the comment, I share his understanding of the relationship between politics and science. Elected officials have an obligation to maintain our nation's prosperity and peace, not merely for their own sake, but because they provide our citizens the liberty to pursue the higher callings of the mind. History best remembers not the civilizations that have done the most to expand their borders, but those civilizations that have done the most to expand the boundaries of human understanding. These are the accomplishments that resonate through the centuries, and it is the work of America's scientists that will serve as our testimony to history.

For all the grandeur of intellectual pursuits, America's interest in scientific progress has a pragmatic urgency as well. Today, your discoveries matter more to our every day life than at any other point in human history. Biotechnology and genetics, not to mention the steady progress of medical science and nanotechnology, are extending and improving our lives. The physics of computer science is sparking new industries that employ millions of Americans and enhance the productivity and well-being of countless more. On the battlefield and in the laboratory, the war on terrorism is being waged, not

just with soldiers, but with software armed with artificial intelligence algorithms. America's health, prosperity, and security are tied to your success. And as a result, our obligation to ensure you have the freedom and resources necessary to advance your work is more pressing than ever before.

This tension between science for the sake of human understanding, and science for the sake of human well-being has marked our history since its first days. Even de Tocqueville thought democracies were ill-equipped to support pure scientific research. The more democratic a society, he wrote "the more will discoveries immediately applicable to productive industry confer gain, fame, and even power on their authors."

But our Founding Fathers had different ideas. Many, most notably Jefferson and Franklin, considered themselves men of science and the government they designed their most daring and novel invention. Jefferson once wrote to a friend, "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 science and of virtue." So vital 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 Merriwether Lewis across the continent to map the land that held our nation's future, he understood the expedition would have two results. 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, and after offering Lewis an education in botany, geology, geography, and the finer points of navigation, he gave the Lewis a broad and simple directive: explore. The information Lewis and his men brought back represented immense steps forward for American sciences from anthropology to zoology and many in between.

In many ways, Jefferson's leadership and the Lewis & Clark expedition established the model for government's partnership with science. And in the 200 years since, government support for scientific research has helped invent the telegraph, split the atom, conquer space, create the Internet, map the human genome, and much more. No nation has ever made such an enduring and significant investment in science, and no nation's scientists have done as much to demystify our world and better the quality of life on earth.

In the years before World War II, America became the adopted home of a generation of scientists fleeing fascism in Europe. Never was the importance of a free society to science more clear. The physicist Emilio Segré was among those who came to America, emigrating in 1938, and eventually working on the Manhattan Project. "America," he wrote at the time, "looks like the land of the future."

America has always been the land of the future. Throughout our history, we have maintained a remarkable devotion to the simple idea that our children's lives should be

better, safer, and richer than our own. This simple idea that we call the American dream has been made real because of the myriad contributions of Americans scientists.

Today, we stand at a pivotal moment. For all our past successes, there are disturbing signs that America's dominant position in the scientific world is being shaken. According to a recent study, America's rate of scientific discovery is lagging behind that of European countries. The number of scientific papers published by American researchers declined last year, and has been flat for the past several years. In contrast, every country in Europe has increased its rate of discovery. In the last two decades of the 20th century, France, Germany, and the United Kingdom doubled their production of doctorates in science and engineering. Japan doubled its production of science and engineering doctorates in just one of those decades. If this stagnation is allowed to continue, it will have profound implications for every aspect of American society. If we are to remain the land of the future, we must reaffirm the partnership that created America's dominant position within the world of science.

Regrettably, rather than strengthening this partnership, I fear that the Bush Administration has allowed it to erode in two critical ways. First, the Administration is abdicating its responsibility to provide scientists with the funding cutting-edge research demands. As you know, the federal 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-60s. Public-sector investments in advanced research have declined sharply, relative to our economic growth rate, and barely kept pace with inflation. This year, federal funding for research is set to increase 4.7 percent. However, the entire increase would go to the Departments 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 Research 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 environment, while increasing 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 offered federal agencies to bring these results 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 financed by the American Petroleum Institute.

In addition, when the Administration has had the opportunity, it has stacked the deck by staffing research boards and 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 diminished. I am hearing from more and more 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 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 hue and cry for more government funding of R&D. There is no widespread public outrage when the Administration disregards the unequivocal judgment of the scientific community. And it's unlikely that the science 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 the connection between the work underway in your laboratories and the problems that affect their lives. This must change. The stakes simply could not be higher. What future challenge will we fail to meet 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 Roosevelt, 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 can do so, if we return to the model established by Thomas Jefferson. There is an implicit ongoing debate within the government regarding what kind 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 field, will inevitably translate into practical applications that improve human life.

For others, that approach is 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. Merriwether Lewis's expedition represented a basic attempt to enlarge the scope of America's understanding of the world around it. It was the stuff of doctoral dissertations. At the same time, because the mission was targeted at the urgent needs of an expanding nation, the voyage captured the support of Washington and the imagination of our young country.

America saw another tremendous example of this in recent years in the Human Genome Project. The effort pooled the combined wisdom of biology, chemistry, physics, engineering, mathematics, and computer science, tapped the strengths and insights of the public and private sectors, brought together 1,000 researchers from six different nations to reveal all 3 billion letters of the human genetic code. Few endeavors have brought together such diverse disciplines for a single and pure pursuit of scientific knowledge. The discoveries of the Human Genome Project have created extraordinary promise in the field of medicine, and brought to life an industry that could lead the American economy for a generation to come.

It has been nearly four years since the Human Genome Project concluded its primary objective. If the science policy of this Administration has failed in any way, it has failed here: it has yet to point the way to the next great frontier of human understanding. It has yet to call scientists from every discipline to a single mission of public service.

Today, we need to rally once again around common goals, and put the broad interests of the nation ahead of the narrow boundaries of scientific disciplines. Surely, there is no shortage of challenges. Should we not set our nation's physicists, chemists, engineers, and geologists to the task of freeing our nation from the need to import oil? Can we create the scientific and technological foundations for affordable, carbon-free energy sources? Can we "level the playing field" for American researchers that lack the resources of our nation's wealthiest universities? Is it beyond our imagination to address the major challenges of developing countries — such as cures and vaccines for AIDS, TB and malaria? In addition to the obvious moral and ethical imperative to do so, the economic and foreign policy benefits from harnessing our scientific and technical talent to foster sustainable development would be profound.

Let me suggest one final goal that could occupy the best efforts of scientists from every discipline for a generation to come. Now that we have surveyed the map of human life, let us turn our attention to that which makes human life unique: the mind. What challenge would be beyond our reach if we truly understood how we learn, remember, think and communicate? What could we accomplish if our education policy was bolstered with a new understanding of how children learn? How much safer could our neighborhoods be, if neurophysiology solves the puzzle of addiction? What industry

would not be strengthened by a more complete picture of the workings of the mind? There is perhaps no field in which major advances would have more profound effects for human progress and health than that of neuroscience. If the American scientific community could come together and communicate to the nation the kaleidoscopic possibilities that could result if we unlocked the secrets of the mind, we could not only achieve untold advances in science, we could open a new chapter in the story of America's support for science.

Investments in science and technology are the ultimate act of hope, and will create among the most important legacies we can leave. America is still, as Emilio Segré said decades ago, the land of the future. We have held that honor since this continent was discovered by a daring act of science more than 500 years ago. We have earned it anew with each passing generation because America's scientists and public officials have understood the importance of applying the power of American curiosity to most intractable American challenges.

The hallmark of American science is not that we have been able to overcome each new frontier. The hallmark of American science is that having conquered one, we impatiently seek out new, more distant and difficult frontiers. America will be able to call ourselves the land of the future so long as we dream that the future holds a better life for ourselves, and so long as those of us who, in Adams's words, study politics, continue to invest in your ability to make that dream real.

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