If the victory at Waterloo, which set the stage for Britain’s preeminence in the century that followed, was “won on the playing fields of Eton,” as the Duke of Wellington famously observed, it may be equally true to say that the contest for preeminence in the 21st century will be won on the campuses of the world’s research universities. In this contest, the United States begins with a substantial advantage. A recent ranking undertaken by Jiao Tong University in Shanghai shows 36 U.S universities among the top 50 universities in the world, with eight of the top 10 in the United States. Author Fareed Zakaria has declared: “[H]igher education is the United States’ best industry. In no other field is the United States’ advantage so overwhelming….And although China and India are opening new institutions, it is not that easy to create a world-class university out of whole cloth in a few decades.”

America’s lead may be less secure than Zakaria suggests. Neither the University of California, San Diego (ranked 13th) nor the University of California, Santa Barbara (ranked 35th) existed 50 years ago. And China, at least, is pouring substantial resources into building a number of world-class research universities, while oil-rich Saudi Arabia is intent on building a research university in the next few years to equal the best universities anywhere. The competitive advantage the United States currently enjoys is obvious, but retaining it cannot be taken for granted; the support from state governments for their “flagship” public universities and the partnership between research universities and the federal government must be renewed and enhanced if America’s lead is to be sustained.

In this paper, I will attempt to describe the importance of research universities to education and science and to society more broadly.

**America’s Research Universities: Contributors to Society**

We often think of our great universities primarily in terms of the education they provide undergraduate students. When parents and students think about universities, they naturally consider such things as the range of available majors and facilities, the quality of the faculty, and the institutions’ size, cost, and reputation. America offers a wide range of nonprofit institutions of higher education – community colleges, four-year liberal arts colleges, technical colleges, state colleges, and public and private research universities. Each type of institution has unique features that appeal to different types of students. The educational purposes are similar: to help students learn to think and analyze issues clearly, and to discover themselves in a new, more independent environment where they can find what they are good at and explore the values that will shape their lives. College is meant to prepare them to be thoughtful citizens and contributing members of their communities, and to prepare them for the world of work and careers. Most importantly, a college
education aims to help students “learn how to learn,” for we know, as well, that to be successful in the 21st century will require a lifetime of learning.

In this array of colleges and universities, the role of research universities is unique, for it is at these institutions, more than at any other, that the faculty is engaged in the research and scholarship that inform and broaden the basis of knowledge taught at all institutions. Thus, the work of research universities enriches teaching and learning at all institutions, creating path-breaking scholarship that expands students’ ability to grapple with the most current and pressing issues. Research universities also provide the advanced education for those who become faculty and educate students at all institutions.

A great strength of the American research university is the joining of research with graduate education. Graduate students are educated at laboratory benches next to their mentors, funded by their research grants and co-authoring papers with them. The benefit goes both ways: graduate education is enriched by the direct conduct of research, and the research is invigorated by the energy and creativity of these students. Other nations increasingly recognize that this is the best system for educating the next generation of scientists and scholars.

Research universities also provide the scientific, technical, and professional foundations for those who will go on to found and lead the new industries made possible by innovative research. Undergraduate students at research universities have broad opportunities to observe and participate in aspects of the research process itself. Placed in a learning atmosphere shared with graduate and professional students, they acquire a firsthand understanding of what is required to prepare for a scholarly or professional career.

**Addressing Urgent Challenges with Science**

The benefits of scientific research are well known. AAU’s “Science as a Solution” offers a survey of how scientific and technological expertise will be required to address the large and urgent challenges confronting the world – problems such as climate change, the energy crisis, and increasing demands on the supply of safe foods and fresh water, as well as the need to cure disease and address the threat of global pandemics. The solutions to these problems begin with basic research. Without an understanding of the structure of the genome, we limit biologists’ ability to develop interventions that will treat disease. Without basic research in materials science, it will be impossible to develop highly efficient solar panels or batteries that store large amounts of energy. Without basic research, we will not be able to develop plant species that resist drought. Virtually all of the microelectronic innovations that have transformed our world in the last two decades have their origins in the laboratories of research universities. Science is a solution, and with the demise of the great industrial research laboratories like Bell Labs, the vast majority of the basic scientific research conducted in America today is done in research universities or government laboratories closely affiliated with research universities. It is the research conducted in these institutions that continues to lead to the creation of new technologies, new businesses, and new jobs that will be needed to fuel the nation’s economic recovery and long-term economic competitiveness.
Improving Public Policy through the Social Sciences

Essential as they are, basic scientific research and technological innovations are not the only contributions American research universities make to our society. Social scientists – economists, sociologists, political scientists, historians, anthropologists, and psychologists – provide new analyses and insights into the problems of society and the means of solving them. They offer a greater understanding of our own society as well as of societies remote from ours in time and distance, so essential in a shrinking world. Without the understanding of the world yielded by these disciplines, we are less able to move in new directions, to undertake new projects for improving society, or to locate ourselves in a wider world. Indeed, none of the major issues for which scientific and technical solutions are required can be addressed effectively without the understanding brought by social scientists. Obviously, the skills of our economists are essential to our efforts to rebuild our nation’s economy. Other issues might be less obvious. Climate change, for example, may alter the relationships between the northern and southern hemisphere and produce large migrations of people, with profound economic, political, and social dimensions. The development of new crops, altering traditional means of production, will have social consequences. And we need social scientists to understand the impact of the process of globalization on traditional and modern societies alike.

The analysis of social scientists, often critical of the status quo, can be disquieting and misunderstood. But it creates the knowledge necessary for change. Effective public policy has always been built on the scaffolding created by research in the social sciences.

Enriching the Human Experience through the Humanities and the Arts

Humanists in our research universities preserve and interpret our own culture, and study others as well. Our nation’s well-being depends, as perhaps never before, on our ability to understand the thinking and ways of life of people in disparate cultural conditions within and beyond our borders. With the virulent forces of nationalism and religious extremism asserting themselves across the globe, we need to understand what gives rise to such movements and how our actions can affect them. Moreover, we cannot fully understand the rich tapestry of our own American experience without knowledge of the historical background and cultural experiences that have informed the lives of Americans arriving here from around the world.

There are also no better champions of the arts than our great universities. Their faculty members produce some of the most important literature and literary analysis and they compose much of today’s new concert music. University theatres produce much of the new drama and new interpretations of the best works of the past. In a society dominated by utilitarian values, it is important to be reminded that our lives are informed and enriched by the aesthetic environment in which we live and by an appreciation for the art, architecture, and music that express the essence of our society.

Since the inquiries of Socrates in ancient Greece, the humanities have given insight into what is true, what is good, what is beautiful – the dimensions of understanding that give meaning, order, and grace to human existence. We can boast of the world’s most powerful military and take pride
in our efforts to improve everyday life here and around the world through open trade and technological innovation. But an equally enduring legacy to humanity, as with past civilizations, will be the power of America’s minds, values, and knowledge, all of which have been nurtured at our great universities. Whether we pass on to the future the structure of a protein, stunning new works of art, the next version of the Internet, or a deeper understanding of the world’s religions, universities are where the best that has been thought, written, or discovered flourishes.

**Enriching Civic and Economic Life**

Many universities also serve as the economic engines of their communities and regions, providing well-educated graduates, supporting hundreds of employees, and creating new businesses and business opportunities. Moreover, American universities make valuable contributions by fostering civic engagement and public service. Capturing the inherent idealism of youth, universities offer services and outreach programs to improve the quality of life in their communities and beyond. As engaged citizens, students, faculty, and staff bring their energy and expertise to their communities in such ways as mentoring and tutoring in K-12 schools, sponsoring community health clinics, spearheading environmental initiatives, and providing ongoing assistance to elderly and disadvantaged residents. Universities partner with their cities and schools, provide world-class health care through their medical centers and clinics, and open their museums, performing arts centers, and recreation and sports centers to their surrounding communities.

It is the intersection of these broad-reaching activities – teaching and learning, scientific research, scholarship in the arts and humanities, public service, and economic development – that gives American universities their remarkable vitality and value to society. As individuals from different disciplines and perspectives come together in collaboration, their very differences enable them to find innovative solutions to society’s problems that no single discipline could.

No wonder, then, that the graduates of research universities, like those of other colleges and universities, give back so generously to their institutions to an extent unheard of in the rest of the world. When doing so, graduates comment repeatedly that their college education transformed their lives, giving them opportunities beyond their grandest hopes and expectations. They give to the universities that opened the world to them so that those institutions can do the same for succeeding generations of students, a substantial percentage of whom are the first of their families to attend college.

In addition, it is important to remember that a key to the vitality of American society has been the democratization of higher education. Our nation assumes that individuals from every socio-economic background should have the opportunity to earn a college degree. Upward economic and social mobility through education is central to the American dream. Colleges and universities help make this possible through the substantial financial aid they provide to low- and middle-income students. It is important that government live up to its promise to assist these students as well.
American Research Universities: Agents of Free Society

A central factor contributing to the quality of American research universities is the autonomy freedom from government control – they have enjoyed. The core American value of independence has given universities space for unencumbered progress and change. The creation of independent colleges in colonial America, whose independence from state control was affirmed in 1819 by the U.S. Supreme Court in the famous case of Dartmouth College, established an essential framework for all of higher education in America. Public universities created during the 19th century were subject to varying forms of state jurisdiction. But they, too, enjoyed broad autonomy and self-governance through governing boards that operated with substantial independence. Thus, the presence of private, independent colleges and universities contributed to the framework of freedom and autonomy granted public universities as well. The resulting growth of competition and movement of faculty between public and private universities have shaped the expectations and parallel developments of each.

Independence also has provided the framework for academic freedom in American universities. It has invested in the faculty the responsibility of defining what is taught, by whom it is taught, and to whom it is taught. It is this fundamental principle of academic freedom that has enabled scholars and scientists within our universities to be free of past dogma, to liberate themselves from a stifling deference to inherited authority, and to advance the frontiers of knowledge in all fields. This openness to new ideas enables students to challenge their teachers and to become critical and creative thinkers in their own right. In this environment, basic research is directed by the researchers themselves. They are able to seek their own methods to solve the questions and problems confronting their disciplines, and to follow their own instincts and ideas about where the solutions lie.

The freedom in which American research universities operate is not limited to the free exchange of ideas. The strength of our universities also is enhanced by the free market in which they compete for people. No external constraints, such as civil service status for faculty or government-mandated salaries, limit competition. Merit, as recognized by professional peers, is the general rule for advancement. As in most of society, merit may not be perfectly achieved in practice, but it remains the primary value system recognizing achievement and allocating rewards.

Freedom within American research universities has also provided the foundation for the development of free institutions throughout the world. During the second half of the 20th century, the United States became the educational destination for thousands of international students and faculty. Returning home after experiencing the free environment and values of America and its universities, these U.S.-educated international students often have become our closest friends abroad and advocates for democratic values in their own countries. This has helped to make the role of American universities central in the global movement to advance democracy. But our nation’s ability to advance democracy through higher education may be lost unless we ease government roadblocks to recruiting international students and faculty. With the rise of new universities around the world, especially in Asia, our universities must be able to continue to recruit the most brilliant international students, scholars, and scientists, or they will go where they feel more welcome.
Accountability Accompanies Academic Autonomy

Independence and autonomy do not come without accountability. The public has a right to be assured that universities achieve what they claim. Both public and private universities are accountable to the taxpayers who help to subsidize their missions, as well as to their trustees, who govern them. Indeed, all American universities are public trusts. They are created to endure over time – some are older than the republic. Those who govern universities hold a trust inherited from past generations. They hold the obligation to improve those institutions before passing them on to future generations. As competitors in a market for students, faculty, and research support, universities are also subject to the discipline of the market and the perpetual effort at improvement. Universities are held to account through the many accreditation agencies that review their various programs. In addition to these structural factors that make institutions accountable, universities are making the results of these various evaluations more accessible to the public. They must continue to make progress on such transparency.

Preserving the Partnership between Research Universities and the Federal Government

Over the course of our nation’s history, a partnership between universities and the federal government formed and evolved to meet national challenges. Thomas Jefferson believed that universities were so important to our democratic ideals and the needs of the nation that he founded the University of Virginia. The Morrill Land-Grant Acts, born of practicality and necessity, articulated parameters of a nascent relationship. The Act stated: “...without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.”

The university-government relationship evolved in the last century into an actual partnership. One aspect of that partnership is the federal government’s providing financial aid to help students receive a college education regardless of income or wealth. The foundation for this element of the partnership was the G.I. Bill, which supported veterans returning from World War II and helped to build the world’s strongest middle class. Today, that support ranges from the Pell Grant for the lowest-income students to student loans, a new G.I. Bill, and other forms of aid. All of these taken together supplement the assistance provided directly by colleges and universities to their students.

Probably the most evident manifestation of the partnership developed during World War II, when scientific effort, most notably the Manhattan Project, helped win the war. After the war, social scientists helped design the economic, political, and security institutions of the postwar world. The partnership was extended thereafter through the blueprint developed by Vannevar Bush in his report to President Truman, “Science the Endless Frontier.” This seminal report recognized the importance of basic research in the development of new ideas and products essential to economic growth and insisted on linking basic research to graduate education. The
university-government partnership grew rapidly after the Soviet Union launched Sputnik in the competitive context of the Cold War.

As the largest sponsor of research, the federal government continues to look to research universities to conduct the bulk of the nation’s basic research, particularly as industry has turned more toward applied research. Economic competitiveness, energy needs, environmental problems, and national security challenges are among the issues the federal government seeks to address through this investment. Moreover, as noted above, the American system succeeds in educating students in the process of conducting research. Universities thus are using this national investment not only to address these critical scientific and technical challenges but also to educate the next generation of scientists, mathematicians, and engineers.

However, the research partnership faces challenges, and its success will continue to depend on several fundamental understandings.

First, it depends on the federal government providing steady, continuous, and predictable financial support for basic research. Basic research requires a complex infrastructure of people, facilities, and equipment. Universities undertake substantial financial obligations when they build the research infrastructure and recruit the best faculty on the assumption that, based on competitive review, their faculty will be able to secure federal research grants. These investments are long-term and cannot be turned off and on easily. If overall funding, or the federal reimbursement for the costs of this infrastructure investment, is reduced unpredictably, universities must either make up the difference from other sources of revenue or reduce their research commitment. This ultimately harms the public interest. To provide the maximum public benefit, both partners must fulfill their responsibilities, but universities face the greater risk.

Second, for the partnership to produce the best research, federal grant funding must be allocated through a competitive merit review process. The genius of the American system of supporting basic research is that it has been built on the competitive structure of our universities, where faculty compete for grant funding based on merit review. This competitive process has been one of the major factors accounting for the widely recognized, exceptional quality of the research conducted in American universities. If it is eroded by the political process, a fundamental aspect of the university-federal partnership will be lost, and, with it, a great source of American scientific and economic competitiveness.

Third, the partnership, like all partnerships, relies on trust. Universities must be held accountable for the investment the federal government makes in them. They cannot simply say, “trust us,” and ask for taxpayers’ dollars. Research must be conducted with integrity and safety. At the same time, the federal government cannot so overburden universities with regulations and reporting requirements that they suffocate in a bureaucracy of compliance review. Faculty should spend their time on teaching, science, and scholarship, not on accounting.

Equally important, trust involves confidence in the value of basic research and in the long-term return that basic research can yield. Government places this trust in universities not blindly but based on ample experience. Applied research has an important role as well, and it deserves the support of both the federal government and private industry. But industry provides little support
for university-based basic research, so recognition of the importance of federal support for basic research is an essential aspect of the partnership.

America’s Strength: The Quality of Its Research Universities

The strength and quality of American research universities are derived from many sources: fundamentally from the freedom in which they operate, and which they, in turn, propagate; from the breadth and interaction of the multiple disciplines they comprise, including basic and applied sciences, technology and engineering, social sciences, arts and humanities; from the partnership between universities and the federal government built on a competitive environment driven by merit; and from the linkage of education, research, and scholarship.

These are the fundamental elements of America’s “best industry.” Our research universities are essential public goods providing a comparative advantage for the United States. As robust as this system is, it is also delicate and can easily decline if treated with neglect or not understood as essential to the future strength of the nation.

The public good that these universities represent can be measured in new ideas that yield new products or new cures to disease; in new approaches to difficult social problems; in new expressions or interpretations of culture; in new and invigorating creative output in the arts; and in the development in students and communities of the practical capacity and moral commitment to help others. Universities’ public good can be measured in the number of graduates who will contribute to the well-being and productivity of society.

And finally, the public good of American universities is also in the intangible, immeasurable contributions they make through a citizenry educated in the framework of freedom for a society that cherishes and seeks to enhance freedom throughout the world.