According to one reliable source, the population of the planet today reached 6,544,121,481. While there is some variability in these estimates and there exists some remote possibility of population decline based on certain demographic models, especially in Western Europe and Japan, overall we can anticipate relatively steady population growth globally. And with the global population projected to increase to 8.5 billion before mid-century, we face challenges of unimaginable complexity in terms of our standard of living and quality of life. And of those 6.5 billion people alive today, less than one in one hundred—less than one percent—has the equivalent of a college degree.

In the world in which we live, with its dynamics and stresses and conflicts, I would argue that we are far from where we should be in terms of developing even the most rudimentary infrastructure for education that is requisite if we are to address the challenges that will confront global society. Before the end of October the population of the United States will exceed 300 million, yet if we were to tally up the number of new colleges and universities established in this nation during the past half century, the list would be very short indeed. If we extrapolate to the level of the planet, we can state with absolute certainty that the infrastructure required to advance the citizens of the world to a level of education necessary to accomplish the outcomes that we would hope to see—environmentally, socially, economically, on any scale or by any measure—simply does not exist.

At whatever level one considers the state of the planet, we are moving toward a period of dramatically escalating complexity. I would term it nothing less than massive complexity. Yet in our policymaking and planning and even in our daily lives we strive to deny that complexity in any way possible. And in our educational enterprises, rather than learning to understand and manage complexity, we continue to restrict our focus with ever-greater specialization and the narrowing of disciplines. The institutional frameworks we call universities do not sufficiently address either the challenges associated with population growth on the scale we are witnessing, or the attendant accelerating increases in complexity.

The very technologies that we assume simplify our lives are themselves fraught with complexity. We live in a world fragmented by borders and obstructed by boundaries, but information technologies have made it possible for both cultural manifestations and scientific and technological innovation to project through boundaries instantaneously, and this very permeability can easily prove to be disruptive. Misunderstanding and conflict is certain to be an unintended consequence of our advances in information technologies, as byproducts of our knowledge are transmitted across the world, increasing in number and frequency.

There are no easy answers, but all of us in this room should recognize the potential for cultural conflict. There are
innumerable opportunities for stresses to ignite unrest in various forms, as evidenced by the hundreds of millions of people who despise the United States, yet know virtually nothing about us. There is no simple explanation for that hate, but that we are entering a period in which technology is distributed at the speed of light and manifestations of our culture are ubiquitous around the world. Just as we draw breath without awareness, technology has advanced to the point that the expression and projection of culture has become unavoidable.

At the current rate of advance the amount of total knowledge in the biological sciences, for example, doubles every 180 days, and I can guarantee that some of that knowledge and the resulting outcomes will not always be used for good. If we do not have the ability or patience to understand the potential for cultural conflict within the complexities of technological advances and the binational or transnational interactions that accompany those advances, we will not be able to resolve conflict within the span of several generations.

**COMPETITIVENESS IN A GLOBAL ECONOMY**

**A**s a nation we are witnessing an unprecedented increase in competition from economies worldwide. India, for instance, has become the fourth largest economy on the planet. India will surpass Japan sometime during the next twenty-four months, and the Chinese will surpass us and become the largest economy in the world. You might say who cares? After all, we are just talking about large numbers of people generating considerable economic activity.

For the first time since 1920, the United States is no longer the dominant producer of peer-reviewed research on science and technology, and this represents an enormous challenge to our national preeminence in scientific and technological discovery and innovation. Since economic competitiveness is driven by technological advance, I would argue that we should care, and care very much, because when one takes into account the increasing wealth of economies with immense concentrations of capital and investment, their adaptability and competitiveness and the capacity for diverse economies to merge, their impact will register globally.

In this rapidly changing and highly competitive environment, I would argue that we both lack an adequate understanding of our competitors and are neglecting to explore the potential for relationships that we may wish to pursue with them, particularly in the high tech sector.

For the United States to remain competitive over the long term, we must work closely with our neighbors, Canada and Mexico. We already enjoy positive and productive exchange with Canada, but our relationship with Mexico is more complicated, and in other areas of the glove, such as the European Union, we have not established a competitive arena. With the EU we have no free movement of labor, no free movement of science and technology, and we must work through an artificial language barrier.

Competition between universities worldwide is a significant but generally overlooked dimension of competition between nations. Two weeks ago I was in Beijing, Shanghai, and Chengdu, traveling to support a number of collaborations we are establishing with various organizations and institutions in China. The senior officers of the Chinese universities I met with seemed more cognizant of this potential for conflict than on my last visit two years ago. While acknowledging the recent ranking of Arizona State University by Shanghai's Jiao Tong University as the one-hundredth leading university globally, they made it quite clear that they expect to meet and surpass our level of accomplishment in the very near future, and there is good reason to believe their assertion.

But we must balance scientific advance with human need while remaining constantly mindful of the responsibility that comes from our commitment to discovery and research. Should we go one step further and claim that discovery must come with a sense of morality? Can there be such a thing as a discovery best kept hidden out of fear that in our technologically advanced society it could be used in an immoral or dangerous way? The view from the scientific and academic community has been that we do the science and this is not our problem.

A well-known philosopher of science I knew during the decade I was at Columbia, Philip Kitcher, has written on the relationships between truth, science, and American democracy. He argued that science without purpose has no moral basis, that unless you understand why you are doing the science, you cannot claim a moral position. This contention struck like a lightning bolt within the academy. Most university scientists do not even want to entertain the thought of assuming a moral position, much less the need to defend one.

Our freshman class this year was born in 1988. They entered school the same year the Internet became interactive and ubiquitous—they have never known a time when an unlimited scope of information was not at their fingertips. These students operate in a different modality
than nearly everyone in this room because their access to
the collective knowledge of the world has been limitless.
Yet what responsibility accompanies this unprecedented
access? Should we therefore teach the moral implications of
information?

ONE PLANET, ONE PROCESS, ONE SET OF DYNAMICS

WE RARELY PAUSE TO CONSIDER THE COMPLEXITY
of the dynamic and interactive system of
biogeochemical cycles that constitutes the earth's surface
environment. Toxic chemicals now commonly found in polar
bears are evidence of this disregard. Airborne poisons found
in the North Pole derivative of factories in Thailand are taken
up into the atmosphere, circulated around the planet, settling
into the food chain thousands of miles distant. We are one
planet, one process, one set of dynamics, and we must make
our advances sustainable instead of destructive.

Every developing metropolis and rapidly urbanizing region
negotiating population influx from economically challenged
rural areas is struggling to resolve labor issues involving
transnational education and transnational transactions. How
do cities acquire sufficient labor outside of their immediate
population? How do they train and develop new workers
that come from an educational system either more or less
advanced than what is available locally? Those regions
that find a workable solution to these issues will have great
advantage over those that turn away from them. Whether one
considers toxic chemicals in the atmosphere or population
dynamics in developing nations, or a myriad of other
challenges that confront us, sustainability is at issue.

But the world is not yet on a trajectory of sustainability.
If our global society were doing a better job, our air and
water would not be polluted, and we would not allow such
a large percentage of the population to live in poverty.
Sustainability embraces environmental concerns, certainly,
but its implications are far richer, spanning issues intrinsic
to economic development, healthcare, planning of the built
environment and urbanization, energy, chemicals, materials,
agriculture, national security, and business, industry, and
government—in short, all the concerns of daily life in
societies around the globe. Sustainability acknowledges the
needs of human societies but in its framing seeks a balance
between social values, including equity and justice, and the
environment.

A FOUR-PART STRATEGY FOR GLOBAL ENGAGEMENT

AT ARIZONA STATE UNIVERSITY WE ARE ADVANCING
a new model for the American research university.
The New American University—this new paradigm for the
American research university—derives from the spirit of
egalitarianism that has always been the basis for our society
and which must never be overlooked in the design of
our institutions of higher education. Without exception
the institutions that come to mind when one thinks of
great universities are focused exclusively on academic
excellence, and that should certainly be the case. We all
want our children to attend renowned universities to be
educated by outstanding scholars and to associate with
peers who are equally outstanding. The only problem with
this scenario is that excellence has been achieved through
exclusion, that is, by constantly restricting the standards for
admission. These standards are at best subjective and more
often than not arbitrary.

ASU operates in a class of approximately one hundred
American institutions termed "Research I" universities,
a designation bestowed by the Carnegie Foundation that
refers to universities that are both comprehensive and
highly competitive in research. But unlike our peers,
we have undertaken the task of designing a university
that combines the highest levels of academic excellence,
maximum societal impact, and inclusiveness to a broad
demographic. Almost without exception, university
presidents share a sense of responsibility and duty to
society, but at ASU we are pioneering a model that
considers these factors intrinsic to the design of the
institution we aspire to become.

We are building a comprehensive knowledge enterprise that
is robust in its breadth and at once flexible, adaptive, and
engaged. We are first and foremost a teaching organization,
but as the nation's youngest major research institution,
we are also a discovery organization. Every member of
the faculty regardless of their discipline must also be a
discoverer. And when I speak of discovery I do not refer
only to science and technology, but to the gamut of ideas,
concepts, theories, models, and algorithms, new tools
and materials and manifestations of personal expression.
This evening I would like to consider the dimension of our
engagement that is global, including our emphases in both
economic competitiveness and sustainability.

If we are to advance the contribution of Arizona State
University to global society, we must do so as a global
institution, integrating the various dimensions we have
been considering. And we are pursuing a four-part global
engagement strategy. The first component of our strategy
is to expand our curriculum and develop new programs
within the core of the university that emphasize global
engagement. Our new School of Global Studies, for
example, offers an undergraduate program that is not focused either on war or peace, as is the case with most international affairs or area studies programs, but rather a focus on quality of life. By operating on the assumption that many conflicts are derivative of lifestyle stresses in given societies, we hope to facilitate positive change in the world. Imagine hundreds of students and dozens of faculty members committed to improving the quality of life worldwide, and the collective energy of such a unified effort emanating from within the school throughout the entire university.

The second component of our strategy is the establishment of the Global Institute of Sustainability (GIOS). Interdisciplinary research on human-dominated environmental systems has long been one of the strengths of ASU, but with the establishment of the Global Institute of Sustainability, ASU has joined a handful of institutions around the world as a leader in the emerging field of sustainability. GIOS is construed across all disciplinary boundaries, bringing together scientists, engineers, and scholars from all disciplines with government and industry leaders to share knowledge and develop solutions to pressing real-world problems. It is a group focused on balancing development with the maintenance of the natural environment while simultaneously fostering economic development.

In China I recently signed an agreement for our first joint project with the Chinese Academy of Sciences. The Chinese government is planning to build ten new cities of 10 million persons each from scratch. Within the next twenty years they foresee a population of 100 million living on land that is not currently inhabited. They are looking at what we are doing here for ideas on how to design cities that are sustainable. We hope that eventually all of our programs, from engineering to the arts, will develop frameworks of global engagement and sustainable community, with paradigms and models that can be incorporated worldwide.

The third dimension of our strategy focuses on expanding our international linkages. ASU currently enrolls approximately two thousand international students, a number that is low for an institution of its size. At a meeting of college and university presidents I attended in January in Washington, DC, it was acknowledged that the government response to the threat of terrorism had caused applications from foreign students to decline dramatically. At ASU applications from foreign students were down 40 percent this year, 35 percent last year, and 30 percent the prior year. In response we are attempting to recruit more foreign students, while simultaneously encouraging our domestic students to study abroad, and not only in English speaking countries.

We have been working vigorously to build what we call core relationships. We have identified four universities around the globe with which we are building comprehensive relationships. With Sichuan University, in Chengdu, China, we have established the International Institute for University Design, linking the two universities in mutually beneficial programs. With Tec de Monterrey, Mexico, one of the leading institutions in Latin America, we have established joint degree programs and research initiatives. The exchange is reciprocal, inasmuch as they have offered us ideas that we have incorporated into our organizational culture. We have also been building a relationship with Dublin City University, an institution in the European Union with which we believe we can rapidly advance a productive relationship. DCU shares characteristics with ASU and is establishing itself on many of the same principles. Similarly, Nanyang Technical University, in Singapore, identifies with our objectives. And while these institutions are not necessarily the most renowned in their respective countries, each has the ability to embrace new paradigms unlike more established schools whose organization and institutional culture render them less adaptable.

The fourth part of our strategy is to launch a large number of new projects and initiatives. For example, we are advancing a multi-million dollar project in Inner Mongolia where through sound management of grassland environments we are helping the Chinese government to end the encroachment of the desert and the dust storms threatening Beijing. During my visit there I never once saw the sun, and it was not raining nor was it cloudy.

An example of a project involving collaboration between the U.S. government and both U.S. and Mexican corporations is ongoing right now. We are investigating the heat island effect in Phoenix and how to alleviate it through new types of building materials, concrete, surfaces, and construction methods. We think this is indicative of how we want to help foster economic growth, both in Mexico and the United States, while simultaneously exploring solutions for labor reform and environmental sustainability.

We are also pursuing new projects funded by USAID with our Mexican counterparts, working on a range of initiatives and programs related to building business and technical alliances within the manufacturing sector. We have projects
ongoing in technology transfer, where we are taking ideas we have developed and finding ways to link these with technological opportunities outside the United States.

We are actively pursuing core relationships with other institutions that we hope will last for decades, such as the e-MBA offered by the W. P. Carey School of Business for top executives in business and government at the Instituto Tecnológico Autónomo de México (ITAM). The program is recognized as one of the best in the country and adds tremendous value to the Mexican economy. We also run an e-MBA program in Shanghai with over two hundred graduates to date, including numerous high-level Chinese officials and presidents of major corporations. We are also working with numerous graduates of ASU in pursuing entrepreneurial opportunities in their fields of expertise that will further our global connections.

Another important step in our global engagement is the appointment of Anthony “Bud” Rock, who will be joining us as vice president for global engagement. Bud holds the rank of minister in the U.S. State Department. He has worked with former Secretary of State Colin Powell and now Secretary Rice, and other key players on assignments around the world related to topics in science, the environment, trade, and technology. Bud Rock will be bringing us the kind of experience and background that will help drive our global engagement strategy forward.

Globalization is neither a fad nor is it a trend. Globalization is the outcome of hundreds of years of connectivity through trade and the transfer of knowledge between cultures. Short of a return to the Dark Ages, the genie is out of the bottle. Collectively the nations of the world will only become more deeply entrenched in the process of globalization, and as a New American University in this rapidly evolving world of global socioeconomics, we have no choice but to embrace it or be crushed.