

Beyond the Ivory Towers: *On Tomorrow's American Research University*
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It is my privilege to offer today some perspective on the potential direction of the American research university in the coming years.

Some of my recommendations and predictions for the future of the American research university may seem surprising or counter-intuitive, while others will affirm what many others in higher education have proposed.

The key is that we must build a case for our campus communities to move in those directions that will require change.

To begin our consideration of a university that can shape the future, allow me to use an image from the distant past.

In the ancient legend, the supreme gods conceal the blessings of fire from humanity. It is just one of many ancient legends that ponder whether the mysterious forces that guide the universe are with us, or against us.

But, as the legend goes, the Titan Prometheus chooses to intervene. And he devises a clever scheme to help humanity.

Athena, the goddess of wisdom, also emerges as a hero in the legend. She secretly tutors Prometheus in the crafts of architecture, astronomy, mathematics, navigation, medicine, metallurgy, and the creative arts. Athena then secretly lets Prometheus back on Mt. Olympus, where he steals fire, and gives it to mankind.

Prometheus is, according to tradition, one of humanity's chief sponsors. In some traditions, he even shaped the first humans from the clay of the earth, and shielded them from the excessive demands of the gods. But above all, he is the one who allows mere mortals to move from darkness to light. He is the one who brings civilization to humans, in the form of the arts, and the sciences, and the professions.

Prometheus is a particularly subversive kind of hero. When he believes that something great is at stake, he is willing even to suffer the fury of Heaven – and indeed he suffers greatly at the hands of Zeus, in the episode's aftermath.

One of the greatest needs in our world today is a need for a "second Prometheus." And the reason that we should cherish our affiliation with the academy is because it is our

calling, within America's great research universities, to play, together, a Promethean role. For the future of our nation. For the future of our world.

Allow me to offer some context. We imagine ourselves dwelling within an enlightened age, and indeed we have accomplished much that was beyond the imagination of our ancestors. But let us consider the advantages that past ages had over us.

For most of human history, our forebears lived at times of greater clarity. Whether they lived in a village or a city, there was far greater consensus about what was real, and what was good, and what was certain. Our ancestors were burdened with fewer choices about how to live, how to die, and what to believe. Even when faced with seismic contrasts of worldviews – say, a Ptolemaic worldview, in which we are the center of the cosmos, or a Copernican one, in which we are one satellite in a more complex system – their choices were far less varied and confusing than what we have now.

At this moment in time, there is nothing resembling a consensus about the nature of our universe or our selves. Even within the empirical scientific community, we are not certain if we inhabit one cosmos or many. And though we feel we are closing in on so-called “theories of everything,” we realize our current theories are always on the verge of extinction.

Among the world's great faiths, and even within any one particular house of worship, conflicts rage about the nature of reality and of morality. Within the academy, ancient and new convictions and observations come into constant battle. Within politics and industry, we are seeing old boundaries blur away. What gods demand our allegiances today, and will they disappear tomorrow, to be replaced by new ones?

Yes, new winds blow toward us from all directions, and we find ourselves at the vortex of an intellectual tornado. In short, to be an intellectually honest human being today is to be very alone. More alone than even our ancestors who preceded civilization.

And we are not merely alone, but we find ourselves in an anxious darkness, more so than in the so-called Dark Ages, because we are aware of the many evils that we ourselves have hurled into this world, and the future damage that could come of them, while lacking the ancient comforts and certainties that our ancestors had regarding their own futures.

Here, in our day, can we dare say that the American research university can be a hero for our times, bringing light to a dark and chaotic world?

It may seem too much to believe. For one thing, the very term “research university” is a dry, clinical one, which does not begin to express the creative capacity of the community of scholars that is found here. Even the word “research” has been under criticism, as implying more attention to the needs of a laboratory than to the needs of a student.

We face increasing cynicism about the academy. Elite research universities have been criticized as being too divorced from the concerns of ordinary women and men, too insular, too wealthy, too inefficient, too expensive, too naïve about the realities of life beyond the ivory tower.

Even the *Economist* magazine described America's top universities a few years ago as "not so much 'palaces of learning' as bastions of privilege and hypocrisy."

And even when we speak of "elite" research universities, bear in mind that the very word elite is now often a code word for snobbery, for arrogance, and for irrelevance.

Something must have gone terribly, terribly wrong, for our society to have lost so much respect for concepts such as expertise, and intellectual authority, and yes, elite status.

Yet do we need to be defensive? We should say, no. Let us not resent this state of affairs. We have something to learn from it, so that we can see beyond our own ivory towers and the walls of the academy, and envision a new relationship with our community, with our nation, with our world, so that the full heroic, Promethean potential of the American research university is realized.

And so, I will offer today five predictions, or prescriptions, for the American research universities that will emerge as leaders of tomorrow.

Not all the elite universities of today will be leaders tomorrow; the richest universities will not necessarily be the leaders tomorrow. For even though universities are among society's most stable institutions, the pace of change will make some of them less relevant in a decade or two.

First, the Promethean universities will be those that know when to be local and when to be global.

They will know when a physical campus community is crucial, despite technological advances in communication, and when it should be irrelevant.

Many experts claim that, because of changes in society, our area of responsibility will look entirely different in a few years.

After all, wouldn't it be cheaper and more efficient to encourage students to pursue an education online?

Isn't a college degree mainly just a credential – a meal ticket to be stamped? And if so, can't the University of Phoenix do this job better and cheaper than we can?

In response, I would like to bring two numbers to your attention: 17 and 22.

17 and 22. These two numbers have great importance to the work that we all do.

At a time when some experts claim college campuses are becoming obsolete, or that universities should establish campuses around the world, these two numbers reveal that many core aspects of campuses will remain forever relevant.

Allow me to explain:

Between the ages of 17 and 22, a human being passes through a long corridor of transformation. A person's mind opens wide!

At a time when many believe a student between the ages of 17 and 22 can have her educational needs met online, I believe we should be considering bringing young persons to campus a year earlier.

During this age period of 17 to 22, young men and women are wrestling with what it means to be fully human, and to live in the society of other humans. Their spirits and personalities are especially impressionable.

It is in this corridor of transformation that much of their identity and many of their lifelong affiliations are formed.

Will this five-year-long corridor of transformation be a dark, narrow, limiting passageway? Or will it be a grand, liberating avenue to citizenship in a world of opportunity?

The answer is up to us—and our universities.

And the answer depends on the manner of experiences that our universities choose to provide.

The model of education that we must follow is more timeless than many would realize.

Humankind's status as social animals can never change! No amount of technology, no amount of virtual reality, can change the fact that humans live in community, and we live for community.

This means, surprisingly, that the traditional campus will always be around, but in a more high-tech way. And the smarter experts saw this day coming, where "high-tech" and "high-touch" are always connected. The more that we live our lives through technology, the more we cry out for real human community.

"High tech" will give the most information, but "high touch" is what will offer them the most powerful experience.

A character in a Mark Twain story once said, "Words are only painted fire; a look is the fire itself."

Think of the teacher-pupil relationship, and think of the two meanings of the word pupil. Our ancestors saw a link between a young student and the tiny image of ourselves reflected in another person's eye.

Plato said that true knowledge of our selves can only be gained by looking deeply into our own soul. And the way that we see that soul is by seeing it reflected in the eye of a wise person.

It reminds us that face-to-face intellectual and creative encounters will always be more powerful than an online community – although, as I will point out later, the gap between the physical kind and the virtual kind will be reduced.

This physical, human community is best done within American research university campuses, and it is a model that is distinctively American.

I point this out because many prestigious American universities are beginning to franchise their brands in the Middle East and Southeast Asia, building campuses and making it possible for students in those regions to receive an American degree while remaining at home.

But for undergraduates especially, life at an elite American research university — with its unmatched opportunities to learn both inside and outside classrooms and laboratories — cannot easily be replicated overseas. McDonald's, Starbucks, Burger King, and Pizza Hut may taste the same in Boston, Bahrain, or Bali, but the experience of being at a great research university is not so easily exported.

Students benefit most when they come together, full time, in a setting that offers both intellectual and physical community, a place where core academic values such as intellectual freedom, the unfettered search for truth, collaboration, diversity, gender equality, and even good old-fashioned school spirit are protected and encouraged. Such an environment best serves foreign and domestic students alike. Indeed, the presence of foreign students on our campuses is beneficial for American society as a whole. Domestic students can develop friends from all over the world and learn informally about their cultures. In doing so, they become better prepared to compete within a global society.

That is crucial at a time when Americans are being forced to move from that Ptolemaic worldview to a Copernican one, in which we are no longer the undisputed center of the world. International students are used to the latter worldview, so our children have much to learn from them.

The American academy represents the spirit of the first Academy, which refers to a small suburb of Athens where Plato, in 387 B.C., refined a model created by Pythagoras.

This particular Academy lasted nine centuries, to the time of Cicero and beyond. You lifted a young person from the comfortable confines of his home — and brought him to live in the Academy, where he would be stretched and molded by ideas and by people.

Indeed, the passage today to adulthood involves far more than time in a classroom:

- The best experience involves meeting people from other backgrounds.
- The best experience involves the chance to study abroad at key global centers.
- The best experience involves community service.
- The best experience involves academic breadth with depth.
- And yes, the best experience involves the collective spirit that a great athletics program can rouse.

William Bowen, the former Princeton president, has argued that athletics is crucial to the life of a great university. He noted that in no other nation does athletics play such a grand role in the building of a university community.

I have seen many world-famous inventors and scholars and entrepreneurs at USC — and what often gives them their greatest sense of joy is being able to give the USC “Victory” sign. It reminds us that, in the end, we want to belong—to belong to something bigger and more enduring than our selves.

So in this first phase of a student’s higher education, the undergraduate phase, the intellectual fire is kindled by encountering new people, new ideas, and new inspiration — in a physical community. It is local.

But the second phase is global. This involves master’s degrees, re-training, certificates, and continuing education.

At this phase, a person can increase her knowledge while working and living anywhere on the planet. This is the educational arena in which communications technology makes distance irrelevant.

While the undergraduate benefits, through proximity, from both the heat and the light of the Promethean fire, the master’s student can benefit from a light that originates far away.

Students today should count on lifelong learning – which means going back to school many times over their lives, to learn skills for new careers that don’t exist yet. This is especially true, given that students today can expect to live to 90, based on some developments that are underway, and given that they may have to work past what we have traditionally considered to be a retirement age.

The Greek playwright Aeschylus in his Orestia trilogy reminds us: Learning is, in the freshness of its youth, even for the old.

And prepare to be surprised by how such learning will look. Most people in 1988 would have made projections about the future of educational technology based on what computers looked like then. And many people today make projections about distance learning based on how online education looks today.

But at USC's Integrated Media Systems Center, the nation's first national multimedia research center, the future of immersive media environments has been previewed. Indeed, we know we are on the way to fully synthesized, three-dimensional virtual reality, in which the face-to-face encounter will be replicated better than ever before.

So, whether or not a student attends a traditional graduate program, she will find that top-quality online learning can help with career advancement and career change—over the course of a lifetime.

There is, however, one more phase of the academy: Doctoral and postdoctoral programs, and selected professional programs such as law. Here, we are back where we started: In community. Here we again must be local.

The Ph.D. is the sign of a hybrid university: One that teaches and one that innovates. And as we have noted, innovation must bring many disciplines together, in order to spark new knowledge. When we pull together, the basic sciences and social sciences and engineering and the humanities and professions, we allow them to find new perspectives and new pathways. And this, like undergraduate education, is best done in physical community.

Let me now offer my second observation about the Promethean university that we need in America:

The Promethean universities will re-define literacy for a new age, and will keep re-defining it.

Our global age demands this. Is a student truly literate if she possesses only the basics of the English language? Perhaps, but she may not be ready for the full opportunities – and the full demands – of a life that will be shaped by people far away, in Shanghai, Mumbai, Latin America, and various emerging economies.

Most research universities have foreign language requirements, but we must treat such requirements as more than a hoop to be jumped through on the way to a diploma. Linguists teach us how each separate language has its own notion of reality.

In a global world, our students will need to understand the different realities that are being experienced by the people they will encounter in their careers! So foreign languages should become central to the mission of our universities – a part of the core curriculum for any discipline and any student, both domestic and international.

Similarly, study abroad programs should be central. I mentioned earlier how bringing international students to our campuses benefits them and our students. But we also need our students to be overseas, doing significant study.

The difference between where we are and where we need to be is a matter of degree. We currently offer exposure – but we need to offer immersion, a full immersion in the enriching waters of global experiences.

And just as our students will benefit from other languages, they must understand the manner in which their own native languages are being altered by the digital media revolution, at a moment in which traditional concepts of literacy are being overwhelmed by new quantities and qualities of information.

So how can we stay mindful, in this Information Age, that there is a difference between information and education? There is a difference between data and wisdom. There is a difference between knowledge transfer and an intellectual community.

And literacy is merely the road to wisdom, and not the destination itself.

The American writer Lewis Lapham observed recently that more is at stake than a sharp memory for facts. “Awaken the student to the light in his or her mind,” he wrote, “and the rest of it doesn’t matter—not the curriculum or the number of seats in the football stadium, not the names of the American presidents or the names of English kings.”

For a young person to know the truth, and to be set free by it, according to Lapham, is for her to trust her own thoughts, to take possession of her own experience and history, and to speak in her own authentic voice. And this can happen, in our day, in more than one way. It can happen by studying a centuries-old painting, or listening to a brand-new song. It could happen through an old book, or a new digital video game.

In short, sparking the imagination of a young person, through the educational experience, requires first re-igniting our own imagination.

We are here to help young people learn to be readers, and writers and storytellers even though the methods of learning are changing. Young women and men who can read and write with a sophistication and clarity appropriate for our age. Who can read and write with insight. Who can read or tell a story not just with traditional words on a traditional page, but new digital forms of fictional and factual information. Who can understand how concepts of accuracy and reliability and authorship have changed from the time they even began their own schooling.

Our students must be prepared to be good interpreters of the digital media chaos before their eyes. These students must be clear thinkers and clear communicators with new digital tools of expression.

We must redefine reading and storytelling at our own confusing moment in history, so that young people will be able to master the creative possibilities that are implicit in their own lives, so that they can adapt and be ready for careers that don't even exist yet.

Indeed, they often know more about how to tell a story with digital media than we do. Here, the lines between learner and teacher are blurred; we are all a community of learners now.

We struggle to move beyond the age of the traditional lecture. But is the age of the lecture over? Is this the age of the seminar, with young people seeking to be drivers of the discussion, with every kind of voice represented?

The digital media revolution is altering how we believe and what we believe. And how we communicate and what we communicate. It demands a new form of literacy – one which adjusts not just to the latest forms of human expression, but which can anticipate and shape future forms.

Heraclitus, in his famous musings on change, said that change is the only constant in our cosmos. And because of this, he noted that a man cannot step in the same river twice, because it is now a different river and he is a different man. But in this cosmos filled with eternal change, what could we count on? Heraclitus' words were instructive: "Character is destiny." And we are transported back to our need to pull timeless wisdom into harmony with the demands of our moment, in a way that cultivates, in ourselves and in our society, a fire that is both ancient and fresh.

How can we combine tomorrow's digital media technologies with the most enduring forms of learning, in order to create a learning experience that is characterized by passion, which is considered central to the process of internalizing knowledge?

Our students must know what forms of communication have the greatest impact on human attention and on human memory. We can reach more people via one medium; but could another medium have greater impact? How can we combine media for maximum effect?

Here we can mostly propose questions – because the answers are still being developed. And, again, this is a journey where we and the students are co-learners. And our university environment becomes one of experimentation!

The future is ours to shape in this area.

Let me now offer my third observation about the Promethean university:

The Promethean universities will succeed in maintaining a steady and warming fire, one which forever renews timeless truths for our very own moment within time.

Think for a moment about how, during last year's presidential campaign, some partisans on both sides suggested that the wrong choice would doom our nation.

And yet two days ago, we witnessed a peaceful transition of leadership in our nation, another in a long line of such traditions.

In a past age, you had to rid an emperor by poisoning him or some other form of assassination. Now, we peacefully come to a consensus.

The premise of a true democracy is that the struggle for the truth will be fought in a different way, in a way that engages the merits of every possible viewpoint.

That once-inconceivable notion became an accident of history that began 2,500 years ago in Athens, and it now animates increasing portions of our world today.

Because of a variety of factors, the Ancient Athenians were an incredibly pragmatic people, eager to break things down into pieces and investigate with as much objectivity as they could summon. We speak of "democratic ideals," but these ideals were birthed in a pragmatic way, by people whose relentless search for better methods pushed them to examine what other civilizations were happy to ignore.

Professor Allan Bloom had argued that only nations that were influenced by the Athenians found themselves willing to doubt that their own way was the best way.

Most societies indoctrinated their citizens to believe that they were unique stewards of a great culture.

Those few nations, whose citizens questioned their own human tendency to ethnocentrism, were the best at learning from others, and, in turn, influencing others.

Think about what a rich dialogue that is. Are these not the traits that have defined our nation at its most dynamic and its most innovative? Are these not the traits that have defined research universities at their most exciting?

Allow me to argue that it is time for the American research universities to re-embrace the classical knowledge of our Western Civilization. The paradox is that, when we come to realize that other roots are as important as ours, the temptation is to become altogether rootless.

Do we allow ourselves to become lazy about our own heritage, because we don't have enough time to learn about everyone else's?

We learn about the history of our core values from the Greco-Roman experiment, and we see how our values have changed through revolutions and evolutions.

The Promethean universities are those that will maintain the spirit of the Greco-Roman classics as the everlasting foundation of modern democratic culture, while going much farther. We should not merely “lean on the Ancient Greeks,” to use the old expression. We should not merely learn from their successes. We should learn from their mistakes. And we should learn equally from the Roman experience with republicanism that followed.

The evolution of democracy in the Greco-Roman experience is an endless fountain of insight into human beings at a moment of astonishing social change.

Oftentimes, we offer the right classes and the right professors to teach classes on such matters. But because the subject matter appears peripheral to the new direction of our society, few students pay attention.

Are we doing them a disservice? Our growth as a society requires each new generation to understand, for itself, what came before it.

Fundamental concepts such as liberty, democracy, republic, president, legislature, senate, judiciary, trial by jury, the right of dissent and open criticism, right to own property, politics, philosophy, academy, tragedy, comedy, rhetoric, poetry, history -- they all derive from the Greek and Latin experience.

How many young American students – or international students – have a clear picture of the global democratic movement? Or its origin? Or its demands for separation of religion and state, or for civilian control of the military? Or the various obstacles that it faces?

Given that so many of these societies have students studying here in America, don't we owe it to them to help them receive insight from the past?

Think of some of the greatest works that have formed our society, but which are only dimly understood today (and these are just a few examples):

- Aristotle's *Ethics*
- Plato's *Symposium* and *Republic*
- Cicero's *On Moral Duties*, *On Old Age*, and *On Friendship*
- Seneca's *On Anger*, *On Clemency*, and *On the Shortness of Life*
- Aeschylus' *Persians*
- Euripides' *Trojan Women*
- Sophocles' *Antigone* and *Oedipus Rex*
- And Thucydides' *History of the Peloponnesian War* and Plutarch's *Parallel Lives*

In fact, it can be argued that, in the Homeric epics and Virgil's *Aeneid*, it is “all in there”: All the Greco-Roman wisdom can be reconstructed from those epics, through a careful reading and thorough analysis.

The ways of the ancient Athenians and Romans have become a part of the very air we breathe, across our planet. You see the Athenian and Roman imprint throughout time:

- through St. Augustine and Western theologians;
- through the Islamic philosopher Al Farabi and Rabbi Moses Maimonides;
- through the Magna Carta;
- through the Renaissance and John Calvin and Francis Bacon;
- through the Enlightenment and Rousseau and Thomas Paine;
- through our American founding fathers;
- and through writers such as Alexis De Tocqueville;
- on through to our own day.

How can we do more to kindle the fires of wisdom in our students, so that they learn from the collision of ideals and values in human history, in order to better grasp the possibilities at their own uncertain moment in history?

Perhaps we can honor those students who make it a point to devour the so-called “supertexts” of history, and distill new insights from yesterday for today, and for tomorrow.

In his leadership book, President Sample used the term “supertexts” to describe those books that have stood the test of time, for 400 years or longer, and which are still widely consulted. In times of constant change, these books remain widely read for a reason: they provide a reliable compass for the human condition. They reveal what is unchanging within the human condition. They help a human being find sure footing on the mountain ranges of life, in order to move upward with a “bold prudence.”

We should commend those institutions that assign summer reading programs, with discussion and reflective components, to their incoming students. But we can do more. Not just for incoming students, but for all continuing students. Not just to draw in students, but to draw in faculty and staff too. And not just for the summer, but for winter, and during the school year. We can offer additional programs that offer choices that challenge them within and across their disciplines.

Our students have passionate debates about political and business ethics on our campuses. What excuse do we have for not having engaged them with Aristotle’s *Ethics*? Or Cicero’s *On the Obligations*? What would an academic community look like in which a meaningful dialogue has been had among poets and philosophers and musicians and mathematicians and entrepreneurs and engineers about a work such as that?

Here, too, the American research university must be Prometheus. We must kindle a fire that is not simply ornamental, but which is powerful and transforming.

In other words, we must teach as if our lives depended on it! And in a sense, they do depend on it!

Having discussed how to make old knowledge fresh for the next generation, I would like to move to my fourth area: Research, and the creation of new knowledge and new works of creativity.

The Promethean universities will be agents of surprise: Their fire will forever point to new pathways.

First, let us ask: If the modern American research university did not exist, would prudent women and men seek to invent it?

Would we agree today to spend hundreds of billions of state taxpayer money to build libraries and laboratories, along with performance halls and athletic fields?

Would we agree today to take hundreds of billions of dollars in private citizens' money and set it aside as endowment in perpetuity?

We may not make such decisions for the first time today.

We should remember that this modern American research university model, which represents a series of historical accidents and opportunities, has served us well. Across the Pacific Rim and Europe, they are not waking up today with a feeling of envy for our financial institutions on Wall Street. They are not sitting in their corporate offices or their political assemblies, feeling jealous about our K-through-12 school system. They are not imitating our car companies.

But they all envy our 50 best research universities. What kind of economic engine would those 50 schools provide? What kind of intellectual capital would those schools inject into their societies?

And let us also take some pride in what we have accomplished during our brief history. Our elementary and secondary educational system is perhaps the world's greatest underachiever, for a variety of unfortunate reasons. How many students come through that system with a greater passion for learning than they entered with?

And yet, the products of our research universities, whether they were born here or overseas, become the leaders of tomorrow. The fact is that America would not be the leader that it is if its research universities were not as strong as they are. Maybe it involves the manner in which our research universities are such dynamic environments for discovery and culture.

We are a different institution from liberal arts colleges or religious schools. Theirs is a different mission. Ours is a place where the final word is not reserved for existing knowledge or doctrine; it is reserved for that new thing that has not arrived yet.

America's top 50 universities produce most of our Ph.D.s. And these Ph.D.s are the manpower (and woman-power) for American research as a whole.

Basic science is the creator and destroyer of global industries and eras. Cutting-edge science and technology discoveries can lead to marketplace innovations that create vast new economic sectors, businesses, jobs, and products to drive the global economy.

The Internet is the most recent example.

This reminds us that federal funding is not a hand-out! It finances the entrepreneurial spirit of American universities. We compete to perform research that benefits America directly and indirectly.

Yes, research universities have been criticized by politicians and the media for being bloated and inefficient. But I would argue that, if we did not have research universities, we would have to invent them.

The Promethean university must be bold and entrepreneurial. Entrepreneurs make things happen while they locate the resources to keep things happening; they do not wait for sufficient funding in order to get started. They don't blame the weather; they make the weather.

And there are three frontiers on which we will want to "make the weather":

The first and greatest is the biological and medical sciences revolution. This revolution is poised to change, quite literally, how we live and how long we live and how well we live. Physics was the queen of the sciences of the 20th century, and biology and medicine will be the queen of the 21st century.

The second frontier involves energy -- including all the issues ranging from alternative fuels to climate change to green economies.

The third frontier involves the continuing communication revolution. In 1990 most of us couldn't imagine an electronic web which could deliver the sum total of human knowledge to our desk, or which could revolutionize global commerce. A mere five or six years later, we could begin to see this.

Think about what an amazing development fax machines were 20 years ago; many people were intimidated from using such a modern technology. Think today of how old-fashioned they are.

Now, can we imagine what another 20 years will mean? Today our students customize their environments with iPhones and iPods and Facebook, while tuning us out; what will tomorrow bring to the students who have not been born yet?

My own sense is that we are on the verge of using communications technologies to immerse us in far better simulated realities that will make us look at this period as a Stone

Age. And so we will again need to redefine literacy and culture in those new contexts, in a manner consistent with what is enduring about the human animal.

That is why these three great scientific revolutions require every part of the research university – science and technology, and the humanities, and the arts, and the professions, working together in an entrepreneurial way.

And that leads to my final point:

The Promethean universities will turn internal rivals into true collaborators and create seminal new ways of addressing society's challenges.

I know, and you know, that interdisciplinarity has become a buzzword. It is already a cliché in some minds. The editors of higher-education trade magazines complain that everyone brags about their intention to do it.

The reality is that most universities have not done it much, or have not done it well.

Just as the ancients learned that fire comes from sparks, and sparks come from friction, intellectual sparks and intellectual fire come from interdisciplinary friction, so all research universities realize that a meaningful encounter of disciplines can provide rocket fuel for this nation's innovation engine. Most universities are still in the sputtering phase, with loud noises and false starts, but still with signs of great promise.

And research universities are closer to pulling off interdisciplinary innovation than any other institution on our planet. Corporations and government agencies have performed incredible acts in reshaping how we live and work. But no corporate R&D laboratory, and no national research laboratory is informed by the rich spectrum of disciplines seen at American research universities – and they could not hope to replicate it anytime soon, even if they had the desire.

No other entity has accumulated the depth and breadth of disciplines as the American research university; from the humanities to social sciences to natural and life sciences to engineering and medicine and other professions. To some extent, this happened by accident, as we developed separate academic units that connected less by a unity of purpose than by flower-lined walkways. And yet these separate units could be one of the greatest serendipities for American society, if re-deployed effectively.

So we need the right financial and career incentives, and the right processes, to promote the Promethean culture, which generates, creates combustion through a unique process.

Oxygen for the intellectual combustion is provided within the spaces that connect different academic disciplines; and within the space that connects the theoretical with the practical; and within the space that connects linear and structured thinking with the nonlinear, creative mind; and within the space that allows a young scholar to question

and challenge an older scholar, in a way that pushes them both forward to new ways of thinking.

What we need, in the end, is a new manner of scholar who works in a new manner of intellectual community:

- A scholar who can live in more than one world;
- A scholar who knows how to work with her peers from other disciplines within the ivory tower;
- A scholar who also knows when to go into the town square, so that she can find ideas and collaborators, from the private and public sector;
- A scholar who then knows when to return to the confines of the ivory tower, so that she can work in an environment of intellectual independence;
- A scholar who is willing to be challenged by the perspective of people from other countries and other generations;
- And, this is crucial: She must be a scholar whose ideas can be translated into societally beneficial innovation. This requires that her university be equipped to offer effective innovation transfer, and a culture that rewards new ideas that can make a tangible difference.

This manner of scholar will have a role to play on several horizons, especially on the three key societal frontiers that I mentioned earlier. And the sparks that will ignite from this interdisciplinary friction will surprise us.

Even the best efforts to predict the future fall short of the best efforts of the human imagination in action. The future is generally more peculiar, and more wonderful, and more textured, than we could have imagined.

We need not predict the future with great certainty; rather, we need to create a dynamic environment in which we can react and change rapidly.

Let me begin to conclude this reflection on the Promethean university by noting that the name Prometheus can be translated as “one with foresight.” And, to serve humanity, American research universities will certainly need foresight.

To have foresight, we need intellectual independence. While we must work with many partners “beyond the ivory tower,” we cannot afford to be pulled by the nose by outside forces. We must ultimately preserve our own academic values, regardless of the opinions of outside agencies or corporations.

As the recent economic meltdown has shown, some treasures can be erased instantly. They existed only on paper. The treasure of the mind, however, cannot be lost.

And when we speak of the treasure of the mind, we speak not of treasures of facts, but treasures of fire – a fire that endures winters and darkness. A fire that can regenerate those things that we have lost, in new and better ways.

In this moment, in this place, do we see our campuses as the deliverer of fire? As the generous source of humanity's most redeeming qualities? As a liberator of the human spirit?

The nature of governments and markets will change and intertwine in coming decades, accelerated perhaps by today's economic pressures. Societies are crashing into one another, with awful and unanticipated consequences. Who will bring order and meaning to the chaos?

Can the American research university, which has so often been belittled, truly aspire to be one of the heroes in this 21st century? Is this the role that it must play?

It may seem arrogant, but I will point out that it will take humble people to play that role.

Because, among the so-called educated class, there are two kinds of people:

1. Those who want to know how the world works; and
2. Those who know how the world works.

If you are in the second group, I believe you do not want to spend your career at a research university. You may feel more fulfilled being a part of a partisan think tank, a small denominational institution, or a social movement.

By contrast, the research university is the breathtaking arena for those people who are humble enough, to be tantalized by the possibility that what we will discover today will throw into doubt what we thought we knew yesterday.

The Promethean university keeps pushing forward, keeps looking for the dim light that will guide us for a few more steps.

The future cannot be micromanaged – it must be allowed to burst forth in unexpected ways. The future does not give up its blessings to narrowly specialized people who work cautiously, in isolation.

No, the future belongs to those who are willing to experiment boldly. Those who are willing to work alongside people who work differently, to find new perspectives. Those who are not afraid to make mistakes. And those who will keep pushing, a thousand times, in the pursuit of understanding our cosmos.

Those are the modern Prometheans, storming Mt. Olympus, in order to encounter Athena and the wisdom she offers, in order to find fire, and in order to bring those blessings back to humanity.

And these persons cannot be headquartered anywhere. They are at home only in an environment that encourages collaboration across disciplines, that encourages experimentation, that allows them to make mistakes over and over, and then to start fresh the next morning. Can the modern corporation allow such an environment? Can a government laboratory? Of course not – only the American research university can.

Our American research universities indeed have fire to capture, and to carry forward to humanity, to warm it and to enlighten it and to enliven it. We can seize, and share, that life-giving flame, which civilizes a species and allows it to stand majestically at the pinnacle of creation.

Thank you!

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