美国能源部长朱棣文哈佛大学毕业典礼演讲

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2009 Commencement Address at Harvard University

- U.S. Secretary of Energy Steven Chu

Madam President Faust, members of the Harvard Corporation and the Board of Overseers, faculty, family, friends, and, most importantly, today's graduates,

Thank you for letting me share this wonderful day with you.

I am not sure I can live up to the high standards of Harvard Commencement speakers. Last year, J.K. Rowling, the billionaire novelist, who started as a classics student, graced this podium. The year before, Bill Gates, the mega-billionaire philanthropist and computer nerd stood here. Today, sadly, you have me. I am not wealthy, but at least I am a nerd.

I am grateful to receive an honorary degree from Harvard, an honor that means more to me than you might care to imagine. You see, I was the academic black sheep of my family. My older brother has an M.D./Ph.D. from MIT and Harvard while my younger brother has a law degree from Harvard. When I was awarded a Nobel Prize, I thought my mother would be pleased. Not so. When I called her on the morning of the announcement, she replied, "That's nice, but when are you going to visit me next." Now, as the last brother with a degree from Harvard, maybe, at last, she will be satisfied.

Another difficulty with giving a Harvard commencement address is that some of you may disapprove of the fact that I have borrowed material from previous speeches. I ask that you forgive me for two reasons.

First, in order to have impact, it is important to deliver the same message more than once. In science, it is important to be the first person to make a discovery, but it is even more important to be the last person to make that discovery.

Second, authors who borrow from others are following in the footsteps of the best. Ralph Waldo Emerson, who graduated from Harvard at the age of 18, noted "All my best thoughts were stolen by the ancients."

Picasso declared “Good artists borrow. Great artists steal.” Why should commencement speakers be held to a higher standard?

I also want to point out the irony of speaking to graduates of an institution that would have rejected me, had I the chutzpah to apply. I am married to “Dean Jean,” the former dean of admissions at Stanford. She assures me that she would have rejected me, if given the chance. When I showed her a draft of this speech, she objected strongly to my use of the word “rejected.” She never rejected applicants; her letters stated that “we are unable to offer you admission.” I have difficulty understanding the difference. After all, deans of admissions of highly selective schools are in reality, “deans of rejection.” Clearly, I have a lot to learn about marketing.

My address will follow the classical sonata form of commencement addresses. The first movement, just presented, were light-hearted remarks. This next movement consists of unsolicited advice, which is rarely valued, seldom remembered, never followed. As Oscar Wilde said, “The only thing to do with good advice is to pass it on. It is never of any use to oneself.” So, here comes the advice. First, every time you celebrate an achievement, be thankful to those who made it possible. Thank your parents and friends who supported you, thank your professors who were inspirational, and especially thank the other professors whose less-than-brilliant lectures forced you to teach yourself. Going forward, the ability to teach yourself is the hallmark of a great liberal arts education and will be the key to your success. To your fellow students who have added immeasurably to your education during those late night discussions, hug them. Also, of course, thank Harvard. Should you forget, there’s an alumni association to remind you. Second, in your future life, cultivate a generous spirit. In all negotiations, don’t bargain for the last, little advantage. Leave the change on the table. In your collaborations, always remember that “credit” is not a conserved quantity. In a successful collaboration, everybody gets 90 percent of the credit.

Jimmy Stewart, as Elwood P. Dowd in the movie “Harvey” got it exactly right. He said: “Years ago my mother used to say to me, ‘In this world, Elwood, you must be … she always used to call me Elwood … in this world, Elwood, you must be oh so smart or oh so pleasant.’” Well, for years I was smart. … I recommend pleasant. You may quote me on that.

My third piece of advice is as follows: As you begin this new stage of your lives, follow your passion. If you don’t have a passion, don’t be satisfied until you find one. Life is too short to go through it without caring deeply about something. When I was your age, I was incredibly single-minded in my goal to be a physicist. After college, I spent eight years as a graduate student and postdoc at Berkeley, and then nine years at Bell Labs. During that my time, my central focus and professional joy was physics.

Here is my final piece of advice. Pursuing a personal passion is important, but it should not be your only goal. When you are old and gray, and look back on your life, you will want to be proud of what you have done. The source of that pride won't be the things you have acquired or the recognition you have received. It will be the lives you have touched and the difference you have made.

After nine years at Bell labs, I decided to leave that warm, cozy ivory tower for what I considered to be the "real world," a university. Bell Labs, to quote what was said about Mary Poppins, was "practically perfect in every way," but I wanted to leave behind something more than scientific articles. I wanted to teach and give birth to my own set of scientific children.

Ted Geballe, a friend and distinguished colleague of mine at Stanford, who also went from Berkeley to Bell Labs to Stanford years earlier, described our motives best:

"The best part of working at a university is the students. They come in fresh, enthusiastic, open to ideas, unscarred by the battles of life. They don't realize it, but they're the recipients of the best our society can offer. If a mind is ever free to be creative, that's the time. They come in believing textbooks are authoritative, but eventually they figure out that textbooks and professors don't know everything, and then they start to think on their own. Then, I begin learning from them."

My students, post doctoral fellows, and the young researchers who worked with me at Bell Labs, Stanford, and Berkeley have been extraordinary. Over 30 former group members are now professors, many at the best research institutions in the world, including Harvard. I have learned much from them. Even now, in rare moments on weekends, the remaining members of my biophysics group meet with me in the ether world of cyberspace.

I began teaching with the idea of giving back; I received more than I gave. This brings me to the final movement of this speech. It begins with a story about an extraordinary scientific discovery and a new dilemma that it poses. It's a call to arms and about making a difference.

In the last several decades, our climate has been changing. Climate change is not new: the Earth went through six ice ages in the past 600,000 years. However, recent measurements show that the climate has begun to change rapidly. The size of the North Polar Ice Cap in the month of September is only half the

size it was a mere 50 years ago. The sea level which been rising since direct measurements began in 1870 at a rate that is now five times faster than it was at the beginning of recorded measurements. Here's the remarkable scientific discovery. For the first time in human history, science is now making predictions of how our actions will affect the world 50 and 100 years from now. These changes are due to an increase in carbon dioxide put into the atmosphere since the beginning of the Industrial Revolution. The Earth has warmed up by roughly 0.8 degrees Celsius since the beginning of the Revolution. There is already approximately a 1 degree rise built into the system, even if we stop all greenhouse gas emissions today. Why? It will take decades to warm up the deep oceans before the temperature reaches a new equilibrium.

If the world continues on a business-as-usual path, the Intergovernmental Panel on Climate Change predicts that there is a fifty-fifty chance the temperature will exceed 5 degrees by the end of this century. This increase may not sound like much, but let me remind you that during the last ice age, the world was only 6 degrees colder. During this time, most of Canada and the United States down to Ohio and Pennsylvania were covered year round by a glacier. A world 5 degrees warmer will be very different. The change will be so rapid that many species, including Humans, will have a hard time adapting. I've been told for example, that, in a much warmer world, insects were bigger. I wonder if this thing buzzing around is a precursor.

We also face the specter of nonlinear "tipping points" that may cause much more severe changes. An example of a tipping point is the thawing of the permafrost. The permafrost contains immense amounts of frozen organic matter that have been accumulating for millennia. If the soil melts, microbes will spring to life and cause this debris to rot. The difference in biological activity below freezing and above freezing is something we are all familiar with. Frozen food remains edible for a very long time in the freezer, but once thawed, it spoils quickly. How much methane and carbon dioxide might be released from the rotting permafrost? If even a fraction of the carbon is released, it could be greater than all the greenhouse gases we have released to since the beginning of the industrial revolution. Once started, a runaway effect could occur.

The climate problem is the unintended consequence of our success. We depend on fossil energy to keep our homes warm in the winter, cool in the summer, and lit at night; we use it to travel across town and across continents. Energy is a fundamental reason for the prosperity we enjoy, and we will not surrender this prosperity. The United States has 3 percent of the world population, and yet, we consume 25 percent of the energy. By contrast, there are 1.6 billion people who don't have access to electricity. Hundreds of millions of people still cook with twigs or dung. The life we enjoy may not be within the reach of the developing world, but it is within sight, and they want what we have.

Here is the dilemma. How much are we willing to invest, as a world society, to mitigate the consequences of climate change that will not be realized for at least 100 years? Deeply rooted in all cultures, is the notion of generational responsibility. Parents work hard so that their children will have a better life. Climate change will affect the entire world, but our natural focus is on the welfare of our immediate families. Can we, as a world society, meet our responsibility to future generations?

While I am worried, I am hopeful we will solve this problem. I became the director of the Lawrence Berkeley National Laboratory, in part because I wanted to enlist some of the best scientific minds to help battle against climate change. I was there only four and a half years, the shortest serving director in the 78-year history of the Lab, but when I left, a number of very exciting energy institutes at the Berkeley Lab and UC Berkeley had been established.

I am extremely privileged to be part of the Obama administration. If there ever was a time to help steer America and the world towards a path of sustainable energy, now is the time. The message the President is delivering is not one of doom and gloom, but of optimism and opportunity. I share this optimism. The task ahead is daunting, but we can and will succeed.

We know some of the answers already. There are immediate and significant savings in energy efficiency and conservation. Energy efficiency is not just low-hanging fruit; it is fruit lying on the ground. For example, we have the potential to make buildings 80 percent more efficient with investments that will pay for themselves in less than 15 years. Buildings consume 40 percent of the energy we use, and a transition to energy efficient buildings will cut our carbon emissions by one-third.

We are revving up the remarkable American innovation machine that will be the basis of a new American prosperity. We will invent much improved methods to harness the sun, the wind, nuclear power, and capture and sequester the carbon dioxide emitted from our power plants. Advanced bio-fuels and the electrification of personal vehicles make us less dependent on foreign oil.

In the coming decades, we will almost certainly face higher oil prices and be in a carbon-constrained economy. We have the opportunity to lead in development of a new, industrial revolution. The great hockey player, Wayne Gretzky, when asked, how he positions himself on the ice, he replied," I skate to where the puck is going to be, not where it's been." America should do the same.

The Obama administration is laying a new foundation for a prosperous and sustainable energy future, but we don't have all of the answers. That's where you come in. In this address, I am asking you, the Harvard graduates, to join us. As our future intellectual leaders, take the time to learn more about what's at stake, and then act on that knowledge. As future scientists and engineers, I ask you to give us better technology

solutions. As future economists and political scientists, I ask you to create better policy options. As future business leaders, I ask that you make sustainability an integral part of your business.

Finally, as humanists, I ask that you speak to our common humanity. One of the cruelest ironies about climate change is that the ones who will be hurt the most are the most innocent: the worlds poorest and those yet to be born.

The coda to this last movement is borrowed from two humanists.

The first quote is from Martin Luther King. He spoke on ending the war in Vietnam in 1967, but his message seems so fitting for today's climate crisis:

"This call for a worldwide fellowship that lifts neighborly concern beyond one's tribe, race, class, and nation is in reality a call for an all-embracing and unconditional love for all mankind. This oft misunderstood, this oft misinterpreted concept, so readily dismissed by the Nietzsches of the world as a weak and cowardly force, has now become an absolute necessity for the survival of man … We are now faced with the fact, my friends, that tomorrow is today. We are confronted with the fierce urgency of now. In this unfolding conundrum of life and history, there is such a thing as being too late."

The final message is from William Faulkner. On December 10th, 1950, his Nobel Prize banquet speech was about the role of humanists in a world facing potential nuclear holocaust.

"I believe that man will not merely endure: he will prevail. He is immortal, not because he alone among creatures has an inexhaustible voice, but because he has a soul, a spirit capable of compassion and sacrifice and endurance. The poet's, the writer's, duty is to write about these things. It is his privilege to help man endure by lifting his heart, by reminding him of the courage and honor and hope and pride and compassion and pity and sacrifice which have been the glory of his past."

Graduates, you have an extraordinary role to play in our future. As you pursue your private passions, I hope you will also develop a passion and a voice to help the world in ways both large and small. Nothing will give you greater satisfaction.

Please accept my warmest congratulations. May you prosper, may you help preserve and save our planet for your children, and all future children of the world.

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