

Keynote Address

By, Dr. Huntington F. Willard

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Let me add my welcome to you this afternoon and offer my hearty congratulations! I thought I was pretty smart when I was in 7th grade, but, believe me, you have all left me in the dust!! To be among the top 2% of students taking the SAT or ACT is remarkable by itself. But to do this two or three years earlier than planned is truly mind-boggling. So, you have my congratulations, my respect, and my awe.

Before I forget, let me also congratulate your parents and your teachers. Partly, this is because I'm a geneticist. And somewhere out there, I have to believe that some part – at least some small part – of your success is due to those terrific genes that you inherited. But, perhaps especially because I'm a geneticist, I also recognize that genes aren't everything. Ultimately, our potential as human beings is unlocked by the environment we find ourselves in – loving, supportive families or dedicated, passionate teachers and mentors. I know that whatever I've been able to achieve (despite my own so-so SAT scores...) has benefited enormously from wonderful teachers at each step of my education. So while you deserve great praise for your hard work and should be justifiably proud of your wonderful achievement, don't forget to thank your teachers.

So now what? You've scored really well on a very challenging test. What comes next? Believe it or not, the hard part comes next! There are high expectations for you, and I suspect that you have high ambitions for yourselves. Some of you, no doubt, have a pretty good idea of what you might want to do with your life – whether that future be in law, medicine, government, business, entertainment, science, architecture or social work. Some of you may want to be a teacher yourself; I know I did. Or an astronaut; I know I did at one point. Or a minister; I wanted to be that too. Some of you may even want to play big-time sports, perhaps in this very stadium where our Duke men and women play basketball. It may come as a surprise to you to know that Duke's athletes are pretty smart themselves! It's not unusual for college athletes here to be scholars, taking a difficult double major or fulfilling a challenging pre-medical curriculum or aspiring to be an engineer. Remarkably talented people often find a way to be remarkably talented in more than one area.

And some of you will have absolutely no idea what you want to be. Believe me, that's ok too! I was lucky; my future was clear to me early on, in ninth grade, when I took my first biology class. I was hooked from then on, and I've enjoyed the many different paths that my interests in biology and genetics have taken me. But what has been so surprising to me is that success along most of these paths required skills, passion and instincts that I was never taught in school. My career in human genetics and then working on the Human Genome Project was the predictable part. But I could not have predicted getting to work on – and even have a bit part in -- a television movie about a scientist that was filmed in my laboratory one summer. Or getting to design a 300,000 sq ft building specifically for interdisciplinary research into biology and



Above: Huntington Willard, Director of Duke Genomics Institute, addresses Duke TIP Grand Recognition Ceremony Honorees

medicine. Or getting to start a small biotechnology company based on research findings from my laboratory. Each of those was an unexpected turn in events that then shaped the next directions my career would take. So, learn to expect the unexpected. Believe me: smart people are no smarter at knowing what the future will bring; but you can be smarter about recognizing opportunities when they present themselves and smarter about knowing what risks to take and where to try to best make your mark.

Let me tell you a story about being smart. This past winter I had the chance to meet several young men, about your age, in Kenya in the eastern part of Africa. They belonged to the Masai tribe. Perhaps you've seen pictures of Masai warriors and herdsman, wearing brilliant red robes, with elegant jewelry and beads on all parts of their bodies and carrying poles. Those poles are important, because it is all that protects them from lions and other predators while they are hiking with their herds for days at a time across many, many miles of the Kenyan landscape in search of food or water for their cattle. They have no cell phones to call for help, only those sticks.



7th Grade Talent Search Grand Recognition Ceremony honorees with their medallions

So, while walking along with these Masai, often in plain view of elephants or other large game who would not take lightly having a Duke professor in their territory, it dawned on me that the only thing keeping me from being trampled was our Masai guide and his wooden stick. As he carefully steered us along a path downwind of the elephants (apparently it isn't a good idea to be upwind of wild animals that are much bigger than you are...), we gently inquired if he was any good at this. After all, if the Masai are like any other group of people, then there must be some who are quite talented and some who are not! And it struck me at that time that this was probably an important thing to find out! Our Masai friend responded simply "if I wasn't very good at this, I'd be dead."

As a geneticist, it occurred to me that this was the ultimate manifestation of Charles Darwin's great theory on evolution, survival of the fittest. Survival isn't getting to be a Duke professor. Survival isn't even scoring in the top 2% of seventh graders taking the SAT. No, survival is knowing how to protect yourself from a lion attack, equipped only with your smart understanding of nature and a small stick.

I didn't give up there. "No, seriously," I said, "there must be friends of yours who aren't any good at herding or at avoiding lions." He thought about this for a moment, and then finally understood what I was asking. "Ahh," he responded. "Those we send to school!" So, there it is. It's important to remember that the achievements worth admiring depend a lot on the circumstances. Here, today, we salute you TIPsters! But there, in the wilds of Kenya, true smarts are rewarded in different ways. And believe me, there is much to admire about those young Masai men and women.

I'd like now to say a few words about science in this country. Now, I know that not all of you love science; I'm not sure that I did either in seventh grade. But it is important that everyone know something about science and the scientific process. There are too many questions and

issues that are critical to life today that involve science and the consequences of science at some level. Consider stem cells, cloning, bioterrorism, genetically-modified foods, genetic discrimination and DNA fingerprinting, just to mention a few. To have an appreciation of these issues and to engage in meaningful debate about them requires both understanding a bit of science and appreciating both the potential and implications of that science.

So, let me mention four lessons I've learned about science. And – who knows? – there might even be some lessons in this for those of you who are sure that you are headed in a very different direction.

First, spend your time researching questions where no one knows what answer to expect. Too many scientists in my view tackle problems where there is a very good outline of the answer and what to predict. Others, the more adventurous sort, step back where you can see only the faint outlines of a black box and you can see all possibilities. For them, science isn't answering obvious questions or walking through open doors; it's searching for new doors where we didn't even know a door existed.

Second, don't confuse data or information with "the answer". Have respect for data; if they are obtained in a truly unbiased manner, then they will be critical for providing the foundation for a possible answer. But remember that an "answer" is merely an interpretation and a judgment, often biased in ways we don't fully recognize by our beliefs, our culture and our politics. An answer isn't "the truth". It is only today's best guess at the truth, based on the data and information you have at hand. No matter how sure you are, it may look very different in the light of tomorrow.

Third, just because it's written in a book doesn't make it so! Beware people who sound too convincing or who speak with great authority. Be respectful, by all means, but be skeptical. Form your own opinions, based on your own data and your own information. But be prepared to change your opinion later, if new data indicate you should.

And fourth, learn how to ask good questions and ask them often. This may seem counterintuitive, but research is all about the questions and rarely about the answers. The smartest people I know (and the smartest students I know) ask the most questions. Don't be afraid to appear "dumb"; it may turn out to be the smartest thing you do.

Now, let me return for a moment to Kenya and conclude with another story about that Masai herdsman with the stick. This story begins some forty years ago, when a young man, probably about your age, was herding his cattle near an airstrip in the middle of the desert. As a plane circled overhead, he looked back and saw a few zebras grazing on the grass runway. He ran back, waving his stick, and chased the zebra away in time for the plane to land. The passenger, a wealthy American in Kenya for a safari, came to speak to the Masai youngster to thank him. As they spoke, the American learned that the young man didn't think he was very good as a herdsman, and that he would rather go to school to



Proud Parents look on at the 2006 Duke TIP Grand Recognition Ceremony

learn about the world. His father, though, thought he was a dreamer and couldn't afford to send him to high school or college. The American befriended the young man and his parents. He offered to pay for the young man's education in Kenya and, after high school, brought him to the United States for an extra year at Exeter Academy in New Hampshire, in order to let him learn about a new culture. At the end of the year, this former Masai herdsman decided he would like to go to college. He applied to Harvard and got in, and after that, he applied to medical school and got in. He spent 10 years in the United States as a physician and research scientist. He then returned to Kenya, where he is now a geneticist in Nairobi, investigating the causes of insect-borne diseases that are so devastating for life in Africa. This former herdsman is now one of the most important scientists of his generation in Africa, made possible by a chance encounter with a few zebra on a runway and a dedication to working hard, to asking questions, and to helping people. He had a talent and he made the most of it.

So, here you are. I salute your accomplishment in arriving here at this Grand Recognition Ceremony. Your talents and achievements are awe-inspiring and you should be warmly congratulated for this. But remember – real talent will come from knowing how to make best use of this achievement, whatever path in life you decide to take or on whatever path life decides to take you.

There are many zebra on the runway. Go find them!