



Educated at Sheffield University in England, he studied metallurgy, earning a 1975 PhD in the discipline. In 1991, the university conferred on him a Doctor of Metallurgy degree for his published work, following it up in 2004 with its highest recognition, an honorary Doctor of Engineering degree.

Wadsworth

Thank you for inviting me to join you for this great, uplifting, Commencement Ceremony.

Let me start by saying that I recognize I am the only thing standing between you and graduation, and party-time, so I plan to be brief.

I was told years ago that for a commencement speech, I am to assume the role of the deceased in an Irish wake; that is, I am necessary for the ceremony, but I am not expected to say too much.

In 1972, about 41 years ago, at age 22, I sat in my own first university commencement, in Sheffield, England.

I could not have imagined at that time that I would ever stand in front of you today, with the introduction that President Jacobs gave me. And, it would have been impossible to imagine myself in my current role at Battelle. First, I will tell you that 40 years have flown by . . . you may not believe it, but it will happen to you so you need to use your time wisely.

Second, I wasn't a very successful student until my early twenties, so my story is one of hope!

As I briefly describe my experiences and observations, I ask you to think about three questions which I have had to deal with, and with which you will have to deal.

Each question is a conundrum — that is, there is no correct answer and the answer will change with time.

First: Where will you live and work?

Second: What will you do?

Third: How will you do it?

So I am clearly not from Ohio – I could say I am from East of Ohio; a very long way East. I was born in, Hamburg, Germany, to English parents, because my father was in the army.

By age 16, I had lived in Germany, Holland, England, Calcutta in India (we travelled by boat and train), Singapore, England, South Yemen (Aden), West Berlin, and England again. I attended eight different schools, and I don't recall liking any of them. Because I have several degrees, people assume I found school to be easy, but I was a below-average student at best.

I did once win a prize for the most improved student – that can be a back-handed compliment.

My dad died when I was sixteen, and my mother and I were pretty much left to figure things out. No-one in my family had stayed at school beyond age fifteen; going to college was completely unheard of.

But at 16, my exam results although not great, were better than expected; I had a clever idea about leaving school but a teacher ordered me to go and sign up at the local school. Being an army kid I said "Yes sir!", and I stayed at school until I was 18. As an aside, I would urge you to take a few minutes and write down on a piece of paper who helped you, and how, and then reproduce that in your own career.

To everyone's surprise two years later I then scraped into Sheffield University to study metallurgy, which nowadays is often called materials science or materials engineering.

Why did I select metallurgy at age 18? I had no idea what to do, and because I wasn't doing very well, a teacher told me I should study pharmacology or metallurgy. I want to emphasize that I worked very, very hard. My work ethic was very high, I just didn't do well.

He asked me after a couple of weeks which I had decided upon. I hadn't, so he gave me a book on metallurgy. I never actually read the book, but applied to study metallurgy.

So I went to Sheffield, and struggled for two years to stay in school. But in the third year, junior year, something happened. I was starting to get interested in metallurgy, but my confidence was quite low. I went to seek help from a professor. He went through a problem with me in detail and asked if I understood. I didn't. So he explained it again; I still didn't understand it, but I was starting to. He went through it for a third time, and half way through I suddenly understood what was going on, and I stopped him at that point because it was suddenly clear to me why the problem was interesting.

I always remember that moment as one that changed my life and I went from strength to strength.

I graduated almost at the top of my class, immediately entered a Ph. D. program, finished in three years, and won prizes. What had happened to me was that once I understood my subject, it stopped being a problem to learn. I have since learned that this phenomenon is not uncommon.

For this reason, I never give up on young people because they may not have had this moment of realizing they can succeed. So never give up – somewhere out there is the interest, the passion, that will make what you do fun.

Let me move again to my three questions:

First: Where will you live and work?

Up to the last 100 years or so, most people lived within 50 miles of where they were born. But this is no longer the case.

After Sheffield University, I came to the United States for one year to do a post-doc at Stanford University in California, and ended up teaching there also. I never went home – but I am a legal immigrant!! Please don't tweet or text the Immigration Department.

I stayed in the California Bay area for almost 25 years, after 4 years at Stanford I worked for Lockheed and then Lawrence Livermore National Laboratory.

Eleven years ago I moved here to Battelle knowing that a year later I would go to East

As I graduated in 1972, the most pressing problem for my generation was the Cold War. The U.S. and the Soviet Union had about 50,000 nuclear warheads; each 10 times the power of the Hiroshima bomb. There was no discussion of global warming; AIDS did not exist. On the other hand, we had sent men to the moon in 1969 and the seeds of the internet revolution had been planted. So, you are graduating at a time that is no less stressful, no less exciting, no less critical – but the details are different.

Today, the threat of mass destruction has been replaced by terrorism, smaller wars, and nuclear proliferation.

The area of energy and the environment is a

Now, the fact is that the nations that address these problems most effectively will prosper. As I go around the world, which I do, I see the international competition stepping up. In China, in Russia, in the Middle East. We follow these trends very carefully.

I conclude that in order to compete, we need three smart things – smart people, smart ideas, and smart environments.

So the U.S. must solve these problems through increased focus on education, science and technology investments, and creation of alternative business solutions through increased awareness of international competition and impacts.

Today, we have work to do on all three of these areas.

Bill Gates recently stated, “This country runs on innovation”. But, innovation requires an increasingly highly-educated workforce.

And this brings me to my great concern – our current state of education. This is across the board, but in particular in the sciences, technology, engineering, and mathematics.

This should be a matter of passionate concern to all Americans, because an educated workforce is the key to innovation.

So in answer to question 2, what will you do? Let me repeat my suggested answer. Do something important. Do something that matters.

The third question is: How will you do your life’s work? My suggested answer is do it with great passion.



Another way to ask this, is how important is it to be happy in your job?

My observation is that working at a job that pays a lot of money, but makes you miserable, is not worth it.

Albert Einstein said something that is helpful in this regard: “The most important motive for work, in school and in life, is pleasure in work, pleasure in its result and the knowledge of the value of the result to the community.”

Steve Jobs, the CEO of Apple, said: “The only way to do great work is to love what you do.”

So, I will give you this advice. If when you wake up, you do not want to go to work, please change what you are doing and find the vocation that inspires you.

And, here is the motivation: The ability to change your job is a privilege that many of your parents, and perhaps most of your grandparents, did not have. My Granddad had to sort sheep fleeces in Tierra del Fuego because in the 1920's in England that was the only job he could find. He was away for 10 months of the year. The unacceptable alternative was to be unable to sustain his family, but parents work hard so that their children will have a better life.

Being passionate about your work is, in my opinion, the one way to achieve personal and professional satisfaction and achievement.

Let me summarize, figure out where you are willing to live, do something that matters, and do it with passion. Think big, think differently, think often. I assure you that the next 40 years will flash by – they have for me. Your source of pride will not be your acquisitions, or your recognitions, but the lives you touched, the differences you made.

I hope that those of you who are graduating today will take with you the vision that is driving the University of Toledo to build on its distinguished history and contribute to creating the workforce of the future.

To you, the members of the Class of 2013, congratulations on your achievements.

I have one final request of each of you: please thank your parents, thank your teachers,