

2019

101st Connecticut College Commencement Address

Tulle Hazelrigg

Follow this and additional works at: <https://digitalcommons.conncoll.edu/commence>

Part of the [Arts and Humanities Commons](#)

This Speech is brought to you for free and open access by the Office of Communications at Digital Commons @ Connecticut College. It has been accepted for inclusion in Commencement Addresses by an authorized administrator of Digital Commons @ Connecticut College. For more information, please contact bpancier@conncoll.edu.

The views expressed in this paper are solely those of the author.

Life After a Liberal Arts Education

Remarks to the Class of 2019

by Keynote Speaker Tulle Hazelrigg, Department of Biological Sciences,
Columbia University
Connecticut College's 101st Commencement
May 19, 2019

First, let me add my thanks to President Bergeron, Marc Zimmer, and the entire Connecticut College community for this incredible honor. I will try to be brief in my comments, because I know that what you really want to do is toss your caps in the air and get on with celebrating.

I grew up in a college town, Bloomington, Indiana, the home of Indiana University. I was always interested in science as a kid. This interest was influenced by my father, who was the head science writer for the I.U. news bureau and an amateur astronomer. Both of my parents were very supportive and tolerant of my interests, so tolerant that they looked the other way and ignored my attempts to fill our home with all sorts of creatures—dogs, cats, chickens, ducks, canaries, frogs, turtles, crickets, and a rat.

My first science experiment occurred during seventh grade when I decided to test Mendel's laws of inheritance by breeding fruit flies in our basement. Because I couldn't stand to kill the flies, I would just let them loose in the house. Soon the house was infested with fruit flies. My father, disturbed by all the flies in the house, asked Herman Muller, the Nobel laureate and geneticist who had discovered, in his studies with fruit flies, that X-rays can cause mutations, what to do. Muller's reply was to invite me to do my science fair projects in his lab.

So, I was on my way to becoming a scientist, or at least having a menagerie when I grew up. Unfortunately, this dream was derailed in high school, when the teacher in charge of our honorary science academy kicked me out after learning that I had attended protests against the War in Vietnam. This politically-motivated rejection made me feel like I didn't belong in science, and I lost my motivation. This was my first big mistake: to let my choices be dictated by the whims and prejudices of others. It took me some time to undo that mistake.

From high school, I went to Oberlin College, my mother's alma mater (she was an accomplished violinist). But an admissions officer hearing me say that I was thinking of getting back into science, said that real science students were certain of their choice before they entered college, and not just thinking about it. And I believed him, a person who knew virtually nothing about me, and majored instead in Philosophy. But as things turned out, the study of Philosophy, and my entire liberal arts education, have helped me greatly as a scientist. This education taught me to think, to ask questions, to make connections between disciplines, and also how to write, all of which have been important for my science.

After college, I didn't know what I wanted to do. Like Marty, I had a series of different jobs and pursued other interests—I was a substitute teacher in the Boston school system, and then a daycare teacher; I spent a year in Sweden and Denmark taking art courses and exploring my mother's Danish roots, and then I worked for a year as a psychiatric aide in a hospital.

At that point, I returned to Bloomington, took classes in psychology, math, chemistry, and biology, rediscovered my love of genetics, and entered the graduate program in Biology. Since then, the study of genes and development in fruit flies has been my life's work.

I want to talk now about my contribution to the GFP story. Marty had shown that a gene's regulatory region could drive the expression of GFP, but I wanted to put GFP onto another protein. So, my graduate student, Shengxian Wang, and I became the first people to attach GFP to another protein, creating a protein with a glowing green lantern that allowed us to follow it in living cells. As at other times, people discouraged me from doing the experiment because they thought it wouldn't work. Fortunately, by this time, I knew enough to ignore the negative comments and proved that they were wrong; the GFP fusion protein behaved just like the normal protein except that now we could see it. I remember well the exciting moment when we sat at the microscope and first saw the bright green fluorescence of the protein in living cells.

One funny thing happened when Marty was writing his paper on GFP. Shengxian and I were completing our experiments, and Marty wanted to reference this unpublished work, and needed my written permission. The letter I wrote said he could cite our work, but only on three conditions: 1) that he made coffee early every Saturday morning for two months 2) that he cooked me a French dinner, and 3) that he took out the garbage nightly for a month. He still hasn't paid, but he showed a slide of this letter during his Nobel lecture. A few months after that lecture the pharmacist at our local drug store recognized Marty and said, "Hey, aren't you the scientist who just won a Nobel Prize?" Marty smiled and said yes, looking pleased. Then the pharmacist turned to me and said "I loved your letter!"

For the last several years at Columbia, I've taught a course called Genes and Development for non-science majors. Teaching non-majors is especially rewarding to me because they bring new and interesting perspectives to the material. Intermixed with the lectures are workshops in which the students discuss the ethical and societal impacts of the science we've been studying. This year the workshops included: The Uses and Misuses of DNA information, Genetically Modified Organisms, Steroid Use and Abuse, Artificial Reproductive Technologies, and Cloning. As an example of the sorts of things the students find to cover, the cloning workshop this year addressed the ethics of cloning pets, as well as environmental impacts of cloning animals threatened with extinction. Without my liberal arts education, I don't think I would have even thought about designing this course in the way I have. That education made me more aware and concerned about how science affects our society, and how advances in science are used.

I want to turn to another topic that concerns me: the status of women in science. Bertie Preer was a good friend who was a role model to me during graduate school. She and her husband John were geneticists who made groundbreaking discoveries about genes, studying paramecia. When she started her career in the 1940s, women rarely got independent jobs in science, so she worked together with her husband in his lab, but nepotism rules made it impossible for her to be paid. In

a lecture she gave as part of the Joan Wood Women in Science Lecture series at Indiana University in 1994, Bertie described her frustration. She said: “Letters of support from former professors and co-workers made no difference. I had lengthy arguments with a dean in the administration, and that made no difference. So, I continued to work with no salary for several years.” Those nepotism rules didn’t change until the 1970s. Today the situation is better, but women still have too many barriers to success in science, starting with not being hired in numbers that reflect their representation in graduate school and in postdoctoral positions. And the culture of the scientific workplace needs improvement so that everyone feels comfortable and fully supported in their careers. Science will progress more rapidly when women share in it equally with men, because science thrives on new ideas and diverse opinions.

Finally, in this last part of my talk, unlike Marty I want to give you some advice, actually the advice, I wish I had heard.

1. Keep in touch with your college professors and other teachers. Let them hear from you every once in a while. One of my greatest rewards as a teacher is to hear what my former students are doing.
2. Find a mentor you trust, in whatever future path you choose, and don’t be shy to ask for help and advice.
3. Don’t listen to people who discourage you.
4. If you choose to follow a new pathway after you leave college, like I did, don’t be surprised if it takes some time to figure this out, and if you experience some setbacks. It’s only through the ups and downs that you will actually figure out what you want, so you should embrace them.

In closing, I want to say the most important thing of all: Congratulations to all of you! And to your families and friends! This is a momentous day for you!