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# 101st Connecticut College Commencement Address

Martin Chalfie

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

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### Remarks to the Class of 2019

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

President Bergeron, Dean Cole, distinguished guests, faculty (especially Marc Zimmer), staff, families, and most of all graduates: Thank you for giving Tulle and me this opportunity to visit and learn about Connecticut College and to speak to you today. Tulle and I were grateful, but surprised, when the invitation came; working scientists don't usually give commencement addresses. And President Bergeron did not make our task easy. In her invitation, she noted that Connecticut College led all other institutions in the number of speeches on a list of great commencement addresses compiled by National Public Radio in 2014, and added, "I am convinced that you would advance this tradition." And then we were told that each of us had half the normal time. So, no pressure.

I looked at that list and to my surprise the speech I consider the most memorable graduation speech, the one I heard 50 years ago at my college graduation, was missing. Before I quote from that speech, let me provide some background. In the Spring before my graduation from Harvard in 1969, a small group of students took over University Hall to protest the War in Vietnam. The University responded harshly, inviting the local police onto the campus where they forcibly removed the students from the building. Several students were beaten. The next day, appalled at what the University had done, the vast majority of Harvard students went out on strike. By graduation, the strike was over, but the students were still angry and sat glumly during the ceremony with red armbands on their black robes.

In this environment of anger, frustration, and distrust, Meldon Levine, a new graduate of Harvard Law School, began his speech<sup>1</sup> saying, "The streets of our country are in turmoil. The universities are filled with students rebelling and rioting. Communists are seeking to destroy our country. Russia is threatening us with her might. And the republic is in danger. Danger from within and without."

The students, feeling that these comments were directed against them, hissed and booed the speaker to show their displeasure, but he persisted, saying, "We need law and order! . . . without law and order our nation cannot survive. . ." At this point a few parents rose and clapped in approval, further annoying the students. After the applause ended, he continued. "These words were spoken in 1932 by Adolph Hitler." The applauding, now ashamed, parents slunk to their seats, and the entire graduating class rose and gave Meldon Levine a sustained and enthusiastic ovation. He went on to say that the protests grew out of the ideals taught the students by their parents and teachers and ended by saying, "You have given us our visions and then asked us to curb them. You have offered us dreams and then urged us to abandon them. You have made us

idealists and then told us to go slowly ... We are asking that you allow us to realize the very values that you have held forth. And we think you should be with us in our quest.”

A great speech. Heart-felt and strong, with a message that said: Graduates, you are right to have your concerns and ideals, your hopes for the future. Those older than you need to see you for the remarkable, dedicated people you have become and listen to you. I think the same of you here today.

I also like this speech because it had no advice for the graduates, since I have always been wary of unasked-for advice. In fact, I am not sure I have advice to give. We are all unique—scientists would say an N of 1—and each of our lives is in turns messy, confusing, complicated, as well as joyful and fulfilling. And good advice for one person is not necessarily good advice for another. Besides, I rarely listen to advice, so why should you? Thus, I do not have words of advice, but I do have opinions. I will tell you something of my life, and Tulle will tell you something of hers, not as models, but to show how the future is full of surprises and pleasures. One of those joys for me has been going through life with Tulle and our daughter Sarah.

I was born in Chicago of parents who were children of immigrants. Neither of my parents went to college because of the Depression. When I went to college, they were proud and supportive, but not having had the experience, they had no suggestions of what I should do.

I entered college being interested in science, but left feeling that I could never be a scientist. A disastrous independent research project in which I repeatedly failed made me lose confidence in my abilities. Part of my failure stemmed from the ridiculous idea I had that asking for help was a sign of weakness and inability.

I’m sure you have heard the phrases “Follow your passion” and “Push through failure and learn from it.” Every time I hear them, I cringe. When I graduated college, I had no idea what I was passionate about. And I didn’t learn from or overcome failure. I quit. Fortunately, I had a second chance.

After graduation, I had a series of short-term jobs (janitor, factory worker, dress salesman, organizer of rock concerts in local parks) and then began teaching high school. There I made an important discovery: students have the summer off; teachers need to find a summer job, and mine was working in a laboratory. This time, however, I asked questions and sought help from others. I also thought of an experiment, which I tried when the boss was away, and it worked, leading to my first publication. This experience taught me several lessons. First, I realized that I did not have to do everything on my own; seeking colleagues’ advice was both useful and important. Second, I found that working with others still allowed me to contribute uniquely to a project. Third, I experienced the tremendous excitement of having an experiment work, to know that I was the first person in the world to see that particular result and to add my contribution to the world’s knowledge. I had found my passion. This summer experience gave me the confidence to go to graduate school.

Today I am a biologist using genetics to study nerve cell development and function, and I still get excited when I get new ideas and when experiments work. My most influential work, however, had nothing to do with these studies. Thirty years ago, I heard about a fluorescent jellyfish protein called Green Fluorescent Protein or GFP in a seminar. GFP glows green when irradiated with ultraviolet or blue light. Since the animals I study are transparent, I stopped listening to the talk and fantasized about the experiments I could do if I could put GFP into them: we could tell which cells had activated a gene because those cells would be green with GFP, or we could see where a protein went in a cell because it brought GFP along with it. Most importantly, we could watch these events in living organisms, we could watch biology happen. These thoughts began a research project that introduced GFP as a general biological marker and, surprisingly, because it was never a goal, led to a Nobel Prize.

Today GFP and other fluorescent proteins are essential tools in biology. For example, GFP-containing bacteria and viruses allow investigators to study how infections spread, and fluorescent mouse tumor cells allow researchers to investigate tumor growth and metastasis. Each year brings new adaptations and new uses. The efforts and thoughts of a great many people have developed uses for fluorescent proteins far beyond what I first imagined.

The GFP story also shows that one never knows who will make the next breakthrough. People worked on GFP for almost 30 years before we (as outsiders) did our experiments. To capitalize on the tremendous potential of scientific discovery, we must provide opportunities for everyone, to leave no one out. Today, I have a small lab with people from or who have parents from China, Chile, Canada, Haiti, and Vietnam as well as the US. They are amazing. We all gain when we enable everyone's potential.

I want to say a little about the consequences of getting a Nobel Prize. First, the Nobel celebration is a wonderful week-long party celebrating academic achievement. And I had never met a king and queen before. The best part, however, was the private dinner with my friends and family where they roasted me mercilessly for three hours. Second, because of the Prize, I have traveled more broadly than I ever imagined I would and talked with high school, college, and graduate students around the world. I can report that the next generation of scientists is truly amazing. Third, the Nobel gave me one more passion, my second job. Four years ago, I was asked to chair the Committee on Human Rights of the US National Academies. Our committee works on behalf of natural and social scientists, engineers, and health professionals anywhere in the world who have suffered significant human rights abuses. These include men and women who have been jailed and, in many cases, tortured for signing petitions or statements advocating free speech, doctors who have been arrested and imprisoned because they treated injured people who their government did not approve of, and researchers whose work angered governments who did not want to hear about their findings. Currently, we work on behalf of 84 people worldwide, but this number does not include the thousands of academics who have lost their jobs or are at risk today in Turkey, Venezuela, and Nicaragua or the many more that have been displaced by war and conflict all over the world. In this effort, I am privileged to work with some astonishingly talented and dedicated people, who constantly act to better the lives of others, and I am honored to lend my voice. Who would have guessed I would get this opportunity as a consequence of playing in the lab?

I'd like to go back a bit and say something else about the work with GFP. At first not many people thought that GFP was going to be that useful. In fact, only one person in my department at that time, in all of Columbia, realized GFP's potential, and it is time you heard from her.

Before you do, let me repeat what I said earlier: our lives are an N of 1, and we all take different paths. So, instead of advice, I have a wish: that you enjoy your uniqueness, keep your enthusiasm and ideals, and marvel at where they take you. You are now on what a friend of mine once called your "infinite summer vacation." Relish it. Congratulations.

*Quotes are taken from a transcript of Meldon E. Levine's speech "A Conflict of Conscience: Our Practice of Your Principles" in the July 7, 1969 issue of the Harvard Alumni Bulletin, pp. 47-48.*