

## Graduate school: the movie

There is a series of documentaries tracking a group of British schoolchildren every seven years, that began when they were all at age seven with a film called *Seven-up*, and has now passed age 35. The films were made with an explicit assumption that social class and innate character, properties already apparent in a seven-year old, would be the defining characteristics of the adult's life. While this assumption turned out to be partly true, the films also showed clearly how much of character seems to be determined by stage of life: in many ways, the 28-year olds were more similar to one another than they were to themselves at 21.

These films have come to mind recently while thinking about the progress of students through graduate school, which has come to seem remarkably consistent to me. The sad thing is that much of the process is traumatic to the student, yet completely predictable and expected. What is needed is a documentary for incoming graduate students, tracking some previous graduate class with interviews about once a year.

Most undergraduates who decide to go into science do so with only a minimal idea of what graduate school is like, let alone what the whole career path will be. The first shock comes when they arrive at a new place and suddenly find themselves surrounded by other students with similar interests and equal talent. On the one hand, it's stimulating. On the other hand, a student who was really one of a kind in college becomes one of a group,

and even the ones from high-powered institutions find their classmates daunting. By the middle of the year, student after student has come to me expressing doubts about their abilities and performance. Each is sure that no other member of their class is concerned. My protests to the contrary are met with polite disbelief and occasional tears. I wish I had an instructive videotape instead of more Kleenex.

Fortunately, the anxiety of the first year dissolves with choosing a thesis lab, and immersion into lab work. This period is the honeymoon of graduate school, characterized by enthusiasm for science, the lab, and the future for about a year. Then, problems. First, with the exception of those students who worked as technicians for a few years, it is rare to see a graduate student who is ready for full immersion into the life of the lab. The diversity of undergraduate life fades into endless days doing the same thing in the same place. Second, nothing goes as quickly as planned, and plans to solve development or protein folding by one's qualifying exam suddenly look as naive as they actually were. Third, internal motivation flags. Undergraduates are constantly being given feedback — grades, evaluations, and the like — and even the most self-motivated use that information to keep themselves on schedule. It doesn't happen in graduate school, and the long, slow, business of making progress in the lab becomes tiring.

Thus follows: the slump. A time comes when the student has been in graduate school for as long as he can remember, and yet will still be in graduate school for as long as he can foresee. Disillusionment with the process, the project, and the advisor are inevitable. This period is accompanied by discreet inquiries to medical schools and patent law firms. Again, each student is

convinced that he is alone. I wonder why they talk to me instead of to each other.

Despite all that, most of the students stay in the lab, and then most hit the crucial transition that comes some time in year four. It often follows a scientific result, especially the kind of scientific result that represents a ticket to freedom. Many students can remember the exact gel or assay that made them realize that they would, in fact, get a thesis, if they could just follow this up and get things done. The later this result comes, the more bitter the student, understandably, but afterwards things change again. Like first love, the first blush of enthusiasm never quite returns, but a different kind of determination appears, and things get done. This is the key element of the documentary, the part to show all the students undergoing anxiety or slumps. If you can see yourself here, eventually, it will all work out. You will graduate, and then the choices will be yours.

In theory, students should be able to see their own futures by looking at the students older than themselves. In practice, it's impossible for the student to imagine that those older students were ever like he is now. So I need a volunteer graduate school class for the documentary. I also need a photographer with a video camera. The film is called: *First Year Up*. It has a low budget, since the target audience is limited. And this documentary will not solve all graduate school problems, since knowing what will happen does not necessarily prevent it from happening to you. But knowing that these stages are normal should relieve some anxiety. To volunteer, please call my agent.

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My Word discusses contemporary issues in science, as they appear to Andrew Murray, Cori Bargmann, and guests. Responses will be welcomed by the editor.