

WHAT FOR ART THOU, Ph.D.?

SCOTT FREEMAN*

I just spent five years thinking about the question posed in the title of this essay.¹ Verily, verily I say unto you: defining a research topic, passing a general exam, collecting data, and writing a dissertation were mere child's play compared to my struggles to come up with a decent metaphor for the doctoral process. The science was manageable, but the poetics were murder. What was *really* going on here? What was this Ph.D. program all about, in *essence*? What did it mean to *be* a scientist?

My first hypothesis was that getting a Ph.D. would be a lot like learning how to drive a cab.

Now not just any cab, mind you, but a London cab. The London Cab Driver Model was my leading metaphor for the Doctoral Process when I entered graduate school.

You see, to be certified as a Cab Driver in London you have to acquire what London Cab Drivers call "The Knowledge." Having The Knowledge means that you know every nook and cranny in the London metropolitan area. You have to know every remote alley and apartment block, every irrational name change for streets. It takes most people a year or two to do this—to memorize London's geography.

Then, to earn your license as a London Cab Driver, you take an exam in which a City of London Cab Examiner tells you where to take her all day. She can give any address that pops into her fiendish City of London Cab Examiner mind, no matter how obscure. You are expected to drive directly to that address, without hesitation, and by the most direct route. If you don't, you flunk. If you do, you're a London Cab Driver.

This, I thought, was what becoming a Ph.D. scientist was all about.

This paper was submitted to the 1991 Dwight J. Ingle Writing Award for young authors.

*Department of Ecology and Evolutionary Biology, Princeton University, Princeton, New Jersey 08544-1003.

¹The title is translated from Playdo's classic philosophical query *Cogitus est Doctoramus?*, according to word-equivalencies given in Wilson's *Phrasebook of Jive Latin*. Some give "Why in God's name do you want to get a Ph.D.?" as the correct rendering; the literature also offers "Intrapersonal Dialoguing Within the Doctoral Paradigm: Potentialities of Conflict and Resolution." The reader is free to choose his or her own favorite.

© 1993 by The University of Chicago. All rights reserved.
0031-5982/93/3602-0804\$01.00

After all, I thought, science is about Knowledge. Once I was a Ph.D., I thought, young Students and members of the Lay Public and even perhaps Congresspersons and Policy-Makers would hail me at the University's curb, ask me a scientific question in my field of expertise, and I, why, I would steer them directly to the answer, without hesitation, and by the most direct route possible. I would do this because I would have The Knowledge, the Scientific Facts.

Or, so I thought. After only a year of graduate school, of watching how science is actually done and how scientists actually are, I knew this metaphor was in deep, deep doo-doo.

First, I realized, getting The Knowledge takes most Cab Drivers a year or two, three at the outside. Getting a Ph.D. takes most scientists five to seven years, nine at the outside. Clearly, something qualitatively different from just getting knowledge was going on here.

Second, I realized, there was a key flaw in the Cab Driver Metaphor. In my second year in graduate school, after I had started to actually do some science myself, I came to realize that the essence of the whole profession, of the whole pursuit, was just that: pursuit. Sure, scientists need to know a lot of stuff, but the thing that separated the great scientists from the mediocre ones wasn't how many *answers* they knew, but how good they were at asking *questions* (emphasis *mine*). Good scientists ask lots and lots of interesting questions. And, as everyone knows, there's nothing worse than a Cab Driver who asks a lot of questions.

Cranking these results through the appropriate statistical machinery (Freeman's Goodness of Metaphorical Fit [GoMF] Test) gave a probability value of 0.42. That is, the London Cab Driver Model was not significantly different from a random metaphor when it came to capturing the essence of the Ph.D. process.

I was crushed. After all, I thought, given the job situation I'd probably end up driving a cab after I got my doctorate. Now I had data to prove that driving a cab had no relationship—not even a metaphorical one—to doing science.

Then, in my third year in graduate school, I experienced one of those rare moments of discovery that most scientists only dream of—the kind that makes you jump out of the bathtub and go running down the middle of the street stark naked, yelling Greek words at the top of your lungs.

Bar Mitzvah.

I know, I know. Bar Mitzvah isn't a Greek word—even *I* know that. No, Bar Mitzvah was my inspiration, my new metaphor.

I had a second hypothesis, far more promising than the London Cab Driver Metaphor. I began working feverishly, late into the night, pursuing data on how well the Bar Mitzvah Metaphor fit the Ph.D. process.

The early results were encouraging—even astonishingly good. The

Ph.D., like the Bar Mitzvah, is a rite of passage: the transformation of a young man or woman from intellectual child to adult, from student to teacher, from consumer of knowledge to producer of knowledge. In the process the Ph.D. student, like the Bar Mitzvah candidate, learns a new language, reads all the holy books and journals and begins to quote them fluently, is trained in an entirely new way of interpreting everyday experience, and discovers a well-defined role and identity in society.

I faltered temporarily when I realized that after a doctoral program you join a community of scholars, while after the Bar Mitzvah you join a community of faith. But . . . there were parallels there. With enough arm-waving the reviewers would never object.

Then, when I stumbled across a Supporting Allegory, I almost called a press conference on the spot. The formal derivation is very complex, so I will give only a broad sketch of the logic here. The first allegorical postulate is as follows: Many years before a boy is ready for the Bar Mitzvah, while still a babe, an infant, he is marked as a candidate, as one of the chosen, by: Circumcision. The correlating allegory follows after many steps, built on postulates supported by *reductio ad absurdum* (RAA): Many years before a student is ready for a Ph.D. defense, while still an intellectual babe, a scientific infant, the student is marked as a candidate, as one of the chosen, by: the General Exam.

Thus, with the Bar Mitzvah Metaphor I could offer a compelling and general explanation for the existence of a phenomenon—the Qualifying Examination—whose function had hitherto been completely mysterious.

This was not Ordinary Poetics, this was *Revolutionary Poetics*—an authentic paradigm shift. The best minds in the world had been barking up the wrong tree in trying to figure out why the general exam existed. Traditionally, scholars had relied on arguments of historical inertia or tortuous appeals to “the student's own good.” Now I could prove, through formal logic, that the General Exam made as much intellectual sense as a Circumcision made medical sense, but **THAT WAS NOT THE POINT!** The point of the Qualifying Exam, like Circumcision, was to signal a point of no return. Afterwards, the candidate was Marked, Differentiated, by the Elders.

But then, as I began to complete chapters in my actual Ph.D. thesis, I uncovered a critical flaw in the Bar Mitzvah Metaphor. Suddenly and irretrievably, the whole string of logic broke down.

For after a Ph.D. defense, so very unlike after a Bar Mitzvah ceremony, there are: No Presents.

Using the data I'd gathered, the Bar Mitzvah Metaphor languished at $p = 0.06$ (Freeman's GoMF Test). I had a metaphor that was only marginally significant—tantalizingly close, but not good enough to publish.

I well recall those dark days just before my Ph.D. defense. Five years of asking questions, of reading, of doing experiments and getting results . . . I was almost a Ph.D. and I still had no idea about what the process was *really* all about. I had mounds of scientific results, but no poetic ones.

I became cynical, anti-social. I walked the darkened, rain-drenched paths of the campus for hours on end. I sneered at the cheerful undergraduates as they laughed and talked on their way to afternoon lab, oblivious of the existential despair sure to engulf the scientific careers they aspired to. I scoffed at my graduate student colleagues, toiling away at their research, unaware that without a strong metaphor to light their way through the trials ahead, without a vision of what *being* a scientist was all about, they were doomed to slip and fall into the black holes of science—the competition, negative reviews, rejected grant proposals, and domineering senior colleagues—that lay just ahead.

Then came the Wednesday afternoon before my defense. I went to the gym, determined to sweat out my metaphorical angst. Just outside, undergrads in colorful shorts and T-shirts scrambled over the enormous rock-climbing practice wall. As I passed by I recognized the person who seemed to be in charge, as a student I'd had in lab.

True to my cynical mood, I challenged her. "Laurie," I said, "rock climbing has got to be the stupidest, most irrational, least rewarding thing I ever heard of people doing in my entire life."

She smiled, and nodded cheerfully.

"So why?" I asked. "Why do you do it?"

"Well," she said, after a thoughtful pause, "have you ever found yourself just sort of wandering around, not doing much of anything different, you know, not challenging yourself or anything?"

"Sure," I replied. I did that for years before graduate school.

"Then one day you see this big rock," she continued. "Know what I mean? A BIG rock."

I nodded. My dissertation question was a very, very big rock.

"So you walk around this rock a few times, and you start thinking about it. You know, like *all* the time you're just thinking about it, wherever you are and whatever you're doing. You keep going back to this rock over and over, and pretty soon you start looking for cracks, you know, like for handholds," she said, gazing wistfully at the practice wall. "Then, you talk to people about this rock. Pretty soon," she went on, "you're not just wandering around anymore like everybody else—you're thinking about this rock all the time and how to get up it. You've just got to climb it."

If I'd been in a bathtub at the time, I would've been sitting bolt upright by now.

"So you start to climb it," she said, her eyes gleaming. "Usually with

a lot of help at first, you know, like from other climbing jocks. They help with technique and equipment and stuff, like the way I'm helping these guys.

"And then, I don't know," she continued, shaking her head wistfully. "Something happens. It's just one of those things you can't explain. You practice and fall and get banged up, but you get higher each time you try, and then one day you make it to the top, and then you're never the same. You're a rock climber."

I kissed her, passionately. "And what do you do after?" I asked, breathlessly.

Still stunned from my embrace, she stammered, "I don't know, tell everybody about the view, I guess."

I ran off, leaving her dazed and bewildered. I ran and ran, back to my office, back to my computer, where I madly began typing in the data she'd given me. I held my breath as I selected "Freeman's GoMF Test" from the STA-TS-SPEAK pull-down menu, and entered "X = Ph.D. program," "Y = Rock climbing," and then "RUN."

I closed my eyes as the hard disk hummed. Slowly, ever so slowly, I opened them. "M = 14.7, p < 0.001." A highly significant result. I was a Man with a Metaphor. The falls, the bone breaks, the scraped knees of graduate school, even the exhilarating view of a successful research result: suddenly it all made poetic sense.

At last, I could not only defend my dissertation, but understand it. I finally knew what I'd been learning to do during the last five years, and what I'd become.

So when my committee and friends gathered in the lecture hall that fateful Friday, I didn't just talk about data and conclusions: I talked about a process, a climb. I gave a talk about the handholds that worked, the cracks I exploited, the view from the top.

My last slide, my concluding image, summed up both the process and the story. It was a slide I'd changed at the last minute—the morning of my defense, as a matter of fact. I threw out the image of a gorgeous sunset with the punchline from my research printed neatly over it, and substituted a hastily-drawn sketch of piles of rocks stretching off into the distance, with my research punchline scrawled underneath. It was a less romantic ending but far more true to life. The view from the top of my dissertation wasn't of sunsets and endings, but of more rocks to climb—ones that I'd never even seen before.