Jeff's View

Postdocs

"What have you done today to make me famous?" asks the distinguished professor, putting a jovial arm around his postdoc's shoulder. If you find this strange – welcome to the postdoc universe.

Most dictionaries will not tell you what "postdoc" means. It is newspeak for "postdoctoral fellow" – somebody who has graduated with a PhD degree and then gone elsewhere for a few years to do research. A scientific apprentice, as it were.

Postdoc – the word says it all. There is the vagueness; "postdoc" specifies neither rank nor duty. There is the lack of status; nobody outside science has ever heard of the word, so it is useless for calling cards, civil service pay scales, or promotion schemes. And there is the no-man's land: the suffix "post" stands for the past and has the melancholic ring we associate with post-modernism, post-genomics, or post-mortem analysis. A postdoc is neither here nor there. The terms "undergraduate student", "graduate student" or "assistant professor" promise a future; "postdoc" does not promise anything. For the others, it is "up or out"; for a postdoc, it is only "out".

Forty years ago, when I was at that stage, most postdocs were in effect "Pre-Assistant Professors". I still think that is what postdocs should be. Whereas freshly minted PhDs can, and should, consider a wide variety of job possibilities – in academia, industry, banking, law, science administration, or politics – someone who has invested several years in postdoc training should aim for a position involving research. But today's shortage of assistant professorships has made this goal elusive. Postdocs may wind up as Research Associates, untenured Assistant Professors, or Guest Scientists – anything that sounds good and means nothing. These phony euphemisms tell us that the postdoc system is in crisis.

The key problem is that postdocs are finding it harder and harder to get a job afterwards. The collapse of the Iron Curtain and the scientific growth of many Asian countries have swelled the number of those wanting to get postdoc training in the USA and Western Europe. But back home, long-term jobs are often scarce or non-existent. And they are also getting scarcer in the USA and Western Europe, which are clamping down on their science budgets in order to straighten out their finances or pay for expensive wars. At US universities, the availability of junior faculty positions is also diminished by tenured professors who do not want to retire. Some of them cannot afford it because of their meager pension, but many just want to hang on because they would not know what else to do, or because they are convinced that science would collapse without them. There *are* exceptional scientists who should never stop doing research, but most of us become less innovative with age and should make room for the next generation. Refusal to do so threatens scientific innovation and the long-term viability of the tenure-track system. Also, the academic job markets in Europe and Japan are notorious for their insider trading and the rarity of independent junior positions. All these problems have led to a massive traffic jam at the end of the postdoc tunnel. Those trapped inside the tunnel must do a second or even third round of postdoc training. But a string of postdoc stints looks bad on the CV and makes it even harder to find a long-term research position.

Another problem is the excessive dependence of many postdocs on their supervisor. Dependence breeds abuse and abuse is on the rise. Successful PhD graduates from many rich countries are generally immune to this problem, because they can count on comfortable postdoctoral fellowships from their home country and therefore pick almost any postdoc mentor they choose. It is *they* who recruit the supervisor, not the other way around. That is why the quality of the postdocs is one of the best indicators for the quality of a laboratory. Institutions in rich countries can also offer postdocs well-paying temporary staff positions. But many postdocs, particularly those from Eastern Europe, India, China and other less wealthy countries, must find a supervisor who is willing to pay their stipend from a personal grant or some "slush fund". There is nothing inherently wrong with such stipends; on the contrary, it is only thanks to them that many young scientists received their postdoc training. But these stipends can be reduced or even stopped at the supervisor's discretion, making the recipient almost totally dependent on the supervisor. Some institutions grant all postdocs, even those paid through research grants or foreign fellowships, the same social benefits they offer their regular employees. But many do not, and that is where the problem lies. I have seen a supervisor getting dissatisfied with the scientific performance of an Asian postdoc and firing him on three months' notice, even though the postdoc had a young family to support and neither the money nor the position to return home. I have seen postdocs appointed on a 50% or even 25% salary, even though they worked full time. And, yes, I have seen postdocs being victimized by cultural arrogance that sometimes bordered on discrimination. Science has never been a perfect shield against chauvinism or intolerance, and the current nationalistic and fundamentalist paranoia has not helped matters. In this poisoned atmosphere, an Arab, Turkish, Indian or Serb passport – or even name – can be a definite scientific handicap. And visa offices will not consider it a bonus, either. Raising this touchy matter is politically incorrect and a university official once gave me a dressing down for offending her with such nonsense. "The lady doth protest too much", Shakespeare whispered into my ear. Thank you for that, William!

History has never known a class-less society and our scientific community is no exception. Whoever thinks that we do things the democratic way should have his head examined. We are usually a meritocratic oligarchy and sometimes a monarchy. I could even name you a few fields that resemble religious sects. You may think that the pecking order at our universities starts with the tenured professors and continues with untenured professors, postdocs, graduate students, and undergraduates. But that is poppycock. If one considers official rights, legal protection and professional representation, the true power structure is tenured professors, untenured professors, undergraduates and graduates, with postdocs at the bottom. Many postdocs, particularly those paid through research

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grants, have no official rights. Students' Associations, fraternities, graduate committees, or Deans of Graduate Studies do not feel responsible for them. Neither do the faculties. Many postdocs lack even proper insurance. They may be on foreign soil and try to cope with unfamiliar customs, an unfamiliar language, or with raising young children. Their spouse may have interrupted a career for their sake and now feel isolated and frustrated. And money is nearly always a problem. For a young couple, the postdoc period can be the most insecure and vulnerable period of their shared life.

On the other hand, insecurity and vulnerability are the sisters of development and evolution – in yeast, fruit flies, as well as human beings. The international flow of postdocs is the bird migration that selects the best, fights inbreeding, and keeps the scientific community healthy. Having done well in two different laboratories and two different countries is a pretty objective quality seal and usually opens many doors. And postdocs – together with the graduate students – are the major engine that drives scientific innovation; postdocs and graduate students do most of the experiments and make most of the scientific discoveries. Without them, we professors would have to roll up our sleeves – and then may the Lord have mercy on us all.

Most of us remember our postdoc years not as Purgatory, but as Paradise Lost. It was then that we could do research without having to sit in lectures, cram for exams, toil in committees, or haggle with students about grades. It was then that we made some of our most original discoveries and chose our long-term field of research. And while the job prospects of today's postdocs are no match for those of young business graduates or MDs, they are way better than those of musicians, writers, painters or actors. Creative professions have always had their price. Keep your ears open at the next faculty party and you might hear a normally reserved colleague talk excitedly about the postdoctoral years: "The boss was a slave driver all right, but the lab was great. Most of the time we were broken and our miserable car crapped out at the worst moments. But I could work in peace and, boy, did I work *hard*!" "You were also still young and crisp" the spouse may add dryly. God bless our spouses.

This rough-and-tumble postdoc universe mirrors that of science and we should not overregulate it. I shudder at the thought that the bureaucrats in Brussels, Washington or Tokyo may decide to put the international postdoc system through their wringer. Science does not need more regional quotas, Centers of Excellence, vacation standards, or 35-h work weeks. It needs young minds willing to try new things, to put up with hard work, and to take risks. Science, the great adventure, needs adventurers.

But science also needs prudence. We should all use it to keep the postdoc system healthy.

If you are a graduate student, start thinking about where to do a postdoc at least 1–1.5 years before you graduate. Shoring up a fellowship can take a lot of time and most good laboratories have a long waiting period. Of course you should look for scientific excellence, but do not forget the human angle. Some famous laboratories are snake pits, which can suck the joy out of science and may warp you for life. Selecting your postdoc mentor is one of the most important professional decisions you are ever going to make, so do visit the laboratory you are interested in and talk to the students and postdocs in private, preferably one at a time. Are they happy with the lab and the supervisor? Would they choose the place again? Do they get the support they need? And what has become of the previous postdocs?

If you are a PhD supervisor, remember that it is one of your most important duties to help your students to select the most suitable postdoc mentor and to write an informed, personal and intelligent letter of application. Many of you do not take this duty seriously, even though it is an essential part of a good graduate education.

If you are a postdoc supervisor, remember that a postdoc's presence in your lab is an unspoken plea to you: "I respect and trust you, and want to learn from you. That is why I have left home to work with you. I am now in your hands – please take good care of me". It is a touching message; let it sink in and work on you.

And now to you, my dear postdoc. You, too, have obligations. Do you enjoy the facilities of your host lab, yet refuse to help maintain them? Are you one of those who invariably call in sick when it is time to clean up the cold room? Do other laboratory members looking for advice make a circle around you because you are always too busy? Do you refuse to chip in when your supervisor needs help in grading an exam? Will you be remembered as one of those obnoxious types that are the curse of a research career? Will you be one of those who routinely ask for letters of recommendation one day before the deadline? Will you secretly plunder the laboratory when it is time to pack up and leave? I could go on, but I guess you got the drift. As a postdoc you are an important member of the laboratory family in which every member depends very much on the others. Do not abuse this power.

One of my former postdocs – let me call him Mark – just received a prestigious prize. I learned of it when I leafed through a scientific journal and caught his photo – that of a self-confident man approaching middle age. Seeing this familiar stranger opened a floodgate of memories. During my research career, I have worked with more than 80 postdocs and I am often no longer sure who overlapped with whom. But I still remember my reaction when I first met each of them face-to-face. Mark's face had shown intelligence, motivation, and that youthful irreverence that I miss seeing as a retired professor. I also sensed an appealing touch of insecurity. He had graduated from a top university but, in spite of his talent, had not done too well in his PhD thesis. His PhD supervisor had been on the outs with him and written a lukewarm letter of recommendation. Here was a gifted young man, whose start in science had been bumpy and who was struggling with self-doubt. We immediately hit it off, but I felt that a heavy burden had been dropped into my lap. At that time, working with postdocs was still a novel experience for me. Also, I had been a bad advisor to my previous postdoc because I had been too immature to handle her rough edges. I was afraid of another failure. I was acutely aware that choosing a postdoc is just as crucial, and difficult, as choosing a postdoc mentor. Would I do a better job with this young man? Where – and who – would he be 10 years down the line? During that first encounter, my insecurity may have outstripped his. Perhaps, that is why the news of his prize gave me such a rush of happiness. It was relief, gratitude, affection, and pride all rolled into one.

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