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Life as a Palaeontologist: Going solo and making a living out of working with fossils

by Leyla Seyfullah ^{*1}

Introduction:

In an [article](#) on Palaeontology [online] last year, Sarah King explained how undertaking a PhD can help you to launch an academic career in palaeontology. Obtaining that PhD can be a frustrating yet ultimately rewarding experience, but it is only the beginning for many palaeontologists — and it is worth pointing out that a PhD isn't a prerequisite for certain jobs in palaeontology (for example, dealing fossils). Here, I hope to give you a sense of what might happen after the PhD, and how this could lead to a wide range of new challenges and take you down previously unimagined paths. You didn't think that getting a job in palaeontology would be straightforward, did you?!

As a PhD (Doctor of Philosophy) student, you are dedicated to working on your doctoral thesis: a single piece of independent research and thinking. After several years of work (in Europe, usually three or four), which could require copious amounts of blood, sweat and tears, you should finally complete your thesis; after successfully defending it (in an examination that is called a viva in the United Kingdom), you will obtain a doctorate that qualifies you as an expert in the field. In the rest of this article, I will summarize my experiences as a 'postdoc' (a postdoctoral researcher) in palaeontology. For me, becoming a postdoc provided the best opportunity to carry out the research that I enjoy and am good at — but it wasn't without its difficulties. Ultimately, I hope that through this postdoc work I will be able to obtain a permanent position in a research institution that will allow me to continue to develop my ideas and keep working with fossilized and living plants. As an adviser once said to me: "A happy worker is a productive worker, and a productive worker is happy!"

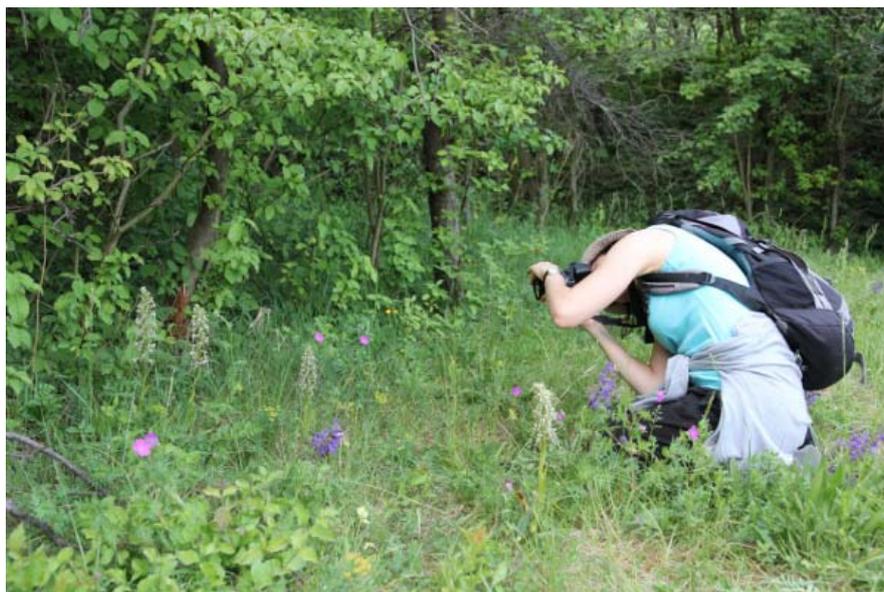


FIGURE 1 — LEYLA IN A FIELD OF ORCHIDS IN GERMANY. CREDIT: L. SEYFULLAH.

Time for a real job:

After I had finished celebrating getting my PhD, my family asked two (im)pertinent questions. Firstly, hadn't I completed my studies yet? Secondly, when was I going to get a 'real' job? I was shocked that people might think that I was planning to stay a student forever (no way, living on a student budget is not easy!) and that what I wanted to do for the rest of my life — stay in academia — was not seen as a real job. Perhaps this perception was because I am the first person in my extended family to get a PhD, and also because I hadn't explained very well what being a postdoc means. To combat this, I will here outline my experiences after completing my PhD, as a postdoc in palaeontology. I am most certainly no longer a student, and I definitely feel as if I have a proper job — I even pay taxes!

First, survive the PhD...

I thought long and hard when deciding on my PhD subject; I knew I would have to devote several intense years to working on living and fossil plants, and this would dictate what I could do next and how I would be able to work in the future. As a result, I really enjoyed most of the experience, although it was not always what I was expecting. During the last two years of my PhD I had to begin thinking about what to do and where to go next, because proposals for research funding can take many months or even years to devise, write up and get assessed. I started developing projects to follow on from my PhD work, and I also started getting involved in other people's applications for funding. I was very optimistic! I breathed a huge sigh of relief when I passed the defence of my PhD at the end of 2008, and thought: **OK, everything is going well on the application front, but I wonder how this disaster in the world economy is going to unfold?** Well, indirectly it was to have a massive impact on my future.



FIGURE 2 — CYPRESS TWIG PRESERVED IN AMBER. CREDIT: L. SEYFULLAH.

The way I saw my choice:

The path I have taken is fairly typical of palaeontologists who want to continue working as researchers at a university or other academic institution. Being a postdoc is strange, liberating and exciting. It is the period of an academic career where you are starting to establish yourself in your field by developing your own research directions and collaborations ('going solo'), but do not yet have too many teaching or administrative responsibilities. There is a major downside, however: you have only a fixed-term position. The postdoc phase can be a period of immense freedom because these temporary contracts provide the opportunity to work in a range of different labs, meet new

working groups and test out ideas that you didn't have time for in your PhD. If you are a postdoc in someone else's research group, the principal investigator (your boss — normally a permanent member of academic staff at your university or institution) is frequently the person who won the research funding, so the responsibility for the project does not rest on your shoulders, although you can personalize the work to make it your own if you wish. The flip-side is the precariousness of this system, particularly if you have family considerations to take into account. Are you going to drag your young family around the world for a reasonably well-paid but temporary job? Are you going to tough it out long-distance for an unknown number of years? What if it all doesn't work out? What happens between contracts? It can be a difficult personal decision.

Intermission:

When the economy went south in 2007, funding opportunities began to dry up as the UK government evaluated the country's debt and realized how little money was left for publicly funded agencies such as research councils and museums. Few research grants were stopped outright, but the competition for funding greatly increased — finding money for research became much harder across the academic world, not just for postdocs but at all levels. I was allowed to stay on at the University of Birmingham, UK, after my PhD to work up papers and ideas for grants as an honorary (unpaid) postdoc. The advantage of this was that I could make use of the cutting-edge equipment in the lab, the extensive library collections and the support of all the staff around me. I also worked part-time as an administrator, helped out on student fieldtrips, took classes and processed samples — anything to pay the bills! Truthfully, it was not a stable or fulfilling time. Trying to juggle administrative work with grant applications, job-hunting and learning to write better scientific papers, along with the weekly search for temporary hours in offices or other university departments, was grindingly depressing. On top of this, I was continually trying to find small sources of funds to tap into so that I could participate in international conferences, network with other researchers and try to get a job elsewhere. I knew that it wasn't just me; plenty of friends and colleagues had lost their jobs or couldn't find anything. So I kept at it, and got by on the support of my family, department, collaborators and the international palaeobotanical community. My luck changed when I appealed (desperately, at this point!) to contacts abroad, because there was little available in the United Kingdom. In the end, as with buses, two offers came along at once. From nothing, I suddenly had the choice either to work on somebody else's project in Switzerland or — rather more appealingly — to work in Germany on an independent project that I had proposed with a researcher whom I had met only once previously.

A new hope:

Having written it based on my own interests, I was particularly keen to work on the independent project, and duly accepted this offer. The project involved studying fossils preserved in [amber](#) to fill in some of the gaps in our knowledge of seed-plant evolution and to reconstruct 'amber forest' ecosystems. I was rather nervous about moving to a new place, but overwhelmingly relieved to have secured a paid position. Finally someone wanted to invest in me and my project — even if it was in a country I had never considered working in before, and where I didn't speak the language. So, I left my home and said 'Auf Wiedersehen' to my partner, pets and plants, and set off with my laptop and suitcase. I arrived in Göttingen, Germany, armed with a guidebook (a thoughtful leaving present) and a phrasebook (an even better leaving present). By the end of the first week, I had a room to live in, an office with a working computer and a bank account, chiefly through the efforts of a very helpful

undergraduate student. By the end of the month, I had my first salary instalment and I could nearly afford to be excited, except that I knew I had to pay off debts and start saving because I was contracted for only a couple of years. Putting all that aside, I focused on trying to learn German at night classes (a disaster and rather inefficient) and getting settled in the lab (much easier).



FIGURE 3 — WILHELMSPLATZ, THE OFFICAL CENTRE OF THE UNIVERSITY OF GÖTTINGEN. CREDIT: L. SEYFULLAH.

When in Rome (or Göttingen):

My first few months in Germany were incredibly hard, especially because I spoke no German. I felt rather alone at times: I knew nobody, and the university is rather old-fashioned and somewhat conservative, located in what can feel like the middle of nowhere (especially in winter). The city is quaint and has lovely timbered buildings, but I quickly discovered that those can be drafty in the winter (as can old British buildings, I'm sure!). For three months, I had immense difficulty understanding the complex domestic recycling system, the obscure university bureaucracy and the general etiquette about basic things such as shaking hands, when to address people using the polite form 'Sie' or the informal 'du' and what gender a noun has. I reminded myself that at least now I had my own project and a salary, so I should make the best of it. I laughed the first time someone said that the best thing about my new university was that it was just a few hours from great cities like Berlin, Hanover or Frankfurt. After the fifth or sixth person said it, I was getting desperate; cabin fever was setting in, so I bought myself a travel card and started to spend one weekend every month investigating the German train system and the fabled places that people were telling me about. I threw myself into more of the terrible language classes, spoke awful German-English hybrids and found myself a lovely flat and a very understanding German flatmate.

After months of stressful negotiations, my supervisor and I finalized plans for the fieldwork that formed the core of my project, and set off on one of the most memorable experiences I have ever had. I spent several months carrying out fieldwork in the Southern Hemisphere, in the southern spring — so I avoided a wet German autumn, which is pretty much like a wet British one — all paid for from my fellowship. I was part of a truly international team of experts. For the first time, when I was introduced as the expert botanist and palaeobotanist, I thought to myself: ***Yes, I can live with this, and this is what it has all been about!***

Sticky questions:

Fieldwork allowed me to develop ideas and collect material with which I could start to answer questions about the relationship between resin (the ‘sticky stuff’ in some living seed plants) and amber, which is fossilized resin.



FIGURE 4 — MILLIPEDES TRAPPED IN FRESH RESIN. CREDIT: L. SEYFULLAH.

I was particularly interested in answering the following questions:

1. What does and does not get preserved in resin and so in the amber?
2. Under what conditions do modern plants start to produce excessive amounts of resin? Some plants produce resin in small amounts (think of sticky bits on pine cones, or small oozing tacky blobs when you cut a pine branch), but amber in the fossil record can be found in large amounts (as well as tiny isolated drops), so what happened to make the trees weep so much resin that then got preserved as amber? There are several hypotheses that might explain this, including the evolution of new wood-damaging insects, diseases or ecological disasters such as hurricanes flattening large portions of forests. My aim was to try to distinguish between these possible explanations.

3. How could this massive resin outpouring be preserved as amber in the fossil record?
Answering this meant looking at the environment and ecology of living trees to see how long resin lasts and how it might get buried and preserved (or not).
4. Can we tell apart the different reasons for resin production in the fossil record using chemical tests on ambers and using the modern resin material as a guide?

I could not possibly hope to answer all of these questions in a short field season or even in one three-year postdoc position, but I wanted to at least work out **how** I could go about answering the questions in the future. The research team that I joined also wanted to learn about newly discovered New Zealand amber deposits, and I was particularly keen to study the fossil plants surrounding them. All this would help us to figure out how these fossils are related to the resin-rich trees that still inhabit the Southern Hemisphere. This subject closely integrates both living and fossilized seed plants, and is strongly linked with their evolutionary history. It is the sort of work that I have always wanted to do.



FIGURE 5 — FOSSILS PRESERVED IN AMBER. CREDIT: L. SEYFULLAH.

Getting my hands dirty:

I spent several weeks in New Caledonia looking at the behaviour, ecology (including associated insects and fungi) and environment of the most resin-rich (and some of the rarest and definitely stickiest) trees in the world today. New Caledonia is a small, very isolated French territory in the southwest Pacific Ocean: a botanical sub-tropical paradise. It is made up of one large island and several small ones (including the Loyalty Islands) and is basically a massive outdoor laboratory, and an excellent example of island [biogeography](#). Some of the strangest relict plants from the ancient land mass of [Gondwana](#) survive there. It is also the centre of diversity of the plant family *Araucariaceae*, which is thought to be the parent plant of most of the conifer-derived ambers. Many

of the plants are extremely endangered, so it was vitally important that I get legal permissions to observe, record and collect them.



FIGURE 6 — FIELDWORK IN NEW CALEDONIA. CREDIT: L. SEYFULLAH.

On the North Island in New Zealand, I collected fresh and [sub-fossil](#) resins from [endemic](#) resin-rich tree species so that I could start to understand fossilization processes in resins. I also collected amber from [lignite](#) mines in the South Island. It was a messy, sticky, but amazing time, and I am incredibly lucky to have been able to go and do this as part of my job. A postdoc is not, however, just about fun in the field, and after the fieldwork the ‘real’ work of chemical analyses must begin; so, back to the lab in Germany.



FIGURE 7 — FIELDWORK IN NEW CALEDONIA. CREDIT: L. SEYFULLAH.

How do German universities work for academics:

I am part of a cross-disciplinary research group in Göttingen. This 'geobiology' group, which encompasses a range of fields such as [molecular biology](#), [evo-devo](#), [microbiology](#), geology and palaeobotany, was founded with start-up money from the German Research Foundation specifically to promote the establishment of new groups that sit outside mainstream research fields. The foundation's rationale was that continued fundamental reform of the German university structure is needed to bring in young, foreign scientists to work in new research areas that could not get a foothold under the traditional system. I have a 100% research contract, so I am not required to teach, but I have given some lectures and seminars in English. German is the preferred undergraduate teaching language, but some higher-level science courses are taught in English. Specifically, we teach palaeontology, geology and molecular biology to biology and geology students. I also demonstrate how to use microscopes and other useful but delicate (and expensive) machinery. I have supervised several student projects (in English), and will have even more this year (word must have got out that writing your thesis in English with the assistance of a native English speaker is a good thing for your career!).

During my day-to-day job, I get to work on fossils with amazingly helpful collaborators from all over the world, and also teach students about conifers, resins and ambers — all in my compact but well-equipped lab and office. This is more or less the best any academic palaeontologist could ask for, and it is just a shame it will not last for longer — but, anyway, on to the next challenge!

Where and what next?

This is the postdoc's perennial question. I still miss my partner, pets and plants, but I have a system worked out with my host that allows me to come back to the United Kingdom every so often to get my fix of home — and to get a good curry! I do feel torn about leaving my partner in the United Kingdom, but there is really little other choice at the moment. My host and I have learned a lot from one another, and we have developed a great research group and ways of working. I might never find a good curry in Germany, but I can have fun there now and feel fairly comfortable. I am happy to stay in Germany, but like all postdoc positions, it is not permanent. So, I keep writing applications and looking for other posts. I would like to come home eventually, and set up my own research group in the United Kingdom; however, part of me is happy to look abroad, because I now realize that it can open up possibilities that I had not previously envisaged. Germany would not have been my first choice for a job after my PhD, but actually I am now quite fond of much of my German experience. I believe that part of this is luck, but much more is about what you make of it. Fingers crossed that plenty more papers and grant-writing lie ahead.

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