ARCHAEOMETALLURGY IN THE UNIVERSITY – A PHD STUDENT'S DAY

July 30, 2011 ruthft Day of Archaeology 2011, Finds,Roman, Romano-British, Science archaeologist, Archaeology,Archaeometallurgy, Arts and Humanities Research Council, Austria,chemical composition, extremely kind and supportive supervisor, head of gold, Humanities, Institute of Archaeology, London, metal objects,physicist, records assistant, Ruth Fillery-Travis, satellite site, Science,Snake head, United Kingdom, United States, University College London, Wolfson Labs

Introduction

My name is Ruth Fillery-Travis, and I am an archaeometallurgist. That is, I use scientific analytical techniques to examine metal objects and the evidence of their production. I'm in a sub-discipline of a sub-discipline, as archaeometallurgy is a part of archaeometry/archaeological science, which is often considered a sub-discipline of archaeology. Luckily enough all the sub-sub-sub stops there, because I'm in the UK – if I were in the US archaeology itself might be considered a sub discipline of anthropology!

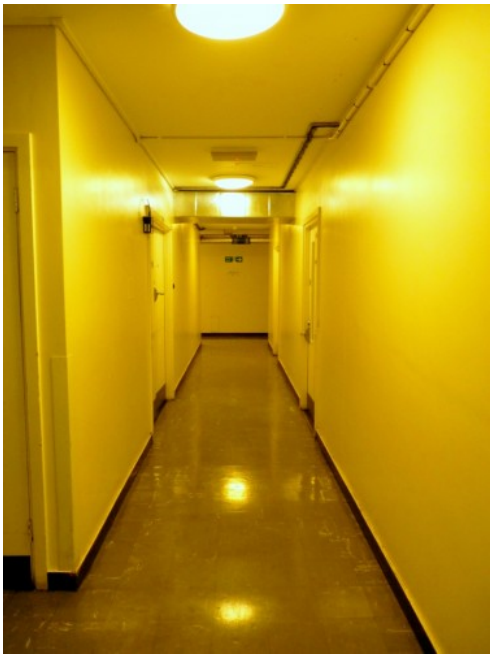
It might seem strange to be in such a niche subject area, but it fits my interests perfectly – I wanted to be a physicist right until I started studying it at university! After that I switched to Classical Archaeology, which had zero science and a lot of critical analysis of art, architecture and archaeological objects. Archaeometallurgy allows me to combine those two areas – I get to look at sometimes quite stunningly beautiful classical objects and not just analyse their physical appearance but use scientific techniques to analyse what they were made of and how they were made – like the snake ring adjacent.

I'm currently reading for a PhD at the Institute of Archaeology, University College London. I started in 2009 – before that I worked in local council archaeology as a records assistant on the 'Sites and Monuments' or (in more modern terms) 'Heritage Environment Records' of Norfolk and then Greater London. Nothing to do with archaeometallurgy – but then that's a common problem with studying archaeology. If you can get

Snake head of gold Roman finger ring

a job in the discipline at all – which
is tough – then it often isn't in the
area you originally trained in. But the advantage of that is that you can gain some fantastic experience – certainly my time working on the Greater London records was fascinating.

Between those jobs I studied an MSc here at the Institute, and I was lucky enough to have an extremely kind and supportive supervisor who guided me through the process of putting together a project proposal and applying for funding for a PhD. Without that kind of support its virtually impossible, and even then I saw lots of good projects and good people fail to find funding. There's very little available, and it's likely to get worse in the near future. I won Arts and Humanities Research Council funding for three years for a project analysing iron production residues from the UK and Austria, but when students ask me about career progression, I generally say it's a rule of 10% – only ten percent of BA students go on to MA/MSc level, and only ten percent of those go through to PhD (if that). I feel very lucky to be able to follow my dream career.



Institute basement corridor - beautiful!

Typical day

I live in London during the week which means I have to do battle with the overcrowded tube, so if I don't have teaching or a meeting I usually don't come into university until 10am so I miss the worst of the crowds. The archaeological science facilities at the Institute are fantastic, particularly the Wolfson Labs where I work, but due to space issues and the weight of the analytical machines we are all confined to the basement which isn't the most glorious of locations!

I nominally share an office with twenty other students – but luckily half of those are part time or work from home. In winter it can get quite crowded, but the nature of archaeological work means that right now most people are off on excavation or site visits – today there are only four of us around. One is in the library, one is hiding somewhere quiet trying to finish her final thesis draft, and two of us are the laboratory most of the day, so the office is pretty quiet. Although I have visited excavations to pick up material for my work, I don't excavate. I'd be happy enough to join an excavation as a specialist, but I've always found the actual digging to be pretty dull on a day-to-day basis, so I make the most of the quiet summer to get my lab work done.

As you can see, I am probably the messiest person in my office! I have something like 100kgs of material stashed in boxes and drawers, and I've just finished a big writing session so there's piles of books and papers on top of the desk as well. Luckily most people deal with much smaller samples, or more valuable stuff that has to be locked away, so most people's desks are not the disaster zones that mine is! On a typical day I'm either at the desk writing and processing data and photos, or in the laboratory doing the

analysis work, so this really is my home away from home.

My desk - not the tidiest place

In the laboratory

I've just picked up a second set of samples from my UK site, as well as a small box of samples from a satellite site associated with my main Austrian samples, so I'm in the laboratory today. Earlier in the week I washed all the samples and took photographs of them all, weighed and measured them and entered the data into my database, so now I'm ready to work on them.

Cups containing resin-mounted samples waiting to harden

When I work on valuable objects such as the Roman jewellery, I use non-destructive techniques or very, very limited invasive techniques. However the material I'm working on now is not considered valuable – it can't be displayed easily or interestingly in a museum, and many people take little interest in it – so I can use more destructive techniques. I cut up the pieces of debris, which are the left-overs from iron production, and I either grind them to a powder or mount cut sections in resin.

The powders are used to create pellets for XRF analysis – this allows me to see the exact chemical composition of the debris including trace elements. The resin-mounted pieces can be polished and then I can examine the crystal structures and any things trapped in the debris using a normal microscope or an electron microscope. The results of this will help me understand how iron was produced during the past, what decisions people made about how to produce iron, and whether people in different places were producing iron in different ways.

Out of the laboratory

It's summer so there's no teaching at the moment, but the advertisements for Teaching Assistants (TAs) for the coming year are out and so I drop in on Joe Flatman who is running one of the courses with TAs to get an idea of his plans for the course before I apply. I was lucky enough to get two TA positions last year and do a bit of occasional teaching and it has been one of the best experiences of the year. There's

nothing more exciting, more engaging, and more thought-provoking than teaching so I'm keen to do more.

By 5pm I'm heading out of the lab and to the station – I'm going home to Brighton and my other half for the weekend and I can get some reading or writing done on the train journey. Long-distance relationships are another common part of an archaeologist's career. Excavators tend to move around a lot and are often away from home on excavations; students move where the funding and the best courses are; and obviously academics have to keep moving if they want to progress.

You don't get any job security in archaeology and it can be hard on partners and families – we often joke in my office that the PhD funding we've got is effectively the longest contract we've ever had, and the best paid! But nothing beats doing something you're passionate about, and if you're willing to make the sacrifices then you can have one of the few jobs in the world where you are discovering things that *no one else knows*. There is so much about the past, from the way people lived, to the things that they wore, to the way they made things, that we just *don't know.* Although I work on objects archaeology for me isn't about*things*, it's about breaking through our own ignorance and uncovering the lost history of our ancestors. I hope that by the time my PhD funding runs out, the economy has recovered enough that I can find a way to keep doing this, because for me there's nothing more exciting and fulfilling than archaeology.