

Late last year, I went on a holiday to Europe with my husband, Chris.

We started our trip in the UK and while we were there we visited the Kew Fungarium in London England and the Royal Botanic Garden Herbarium in Edinburgh Scotland.

I'd like to talk about those visits tonight.

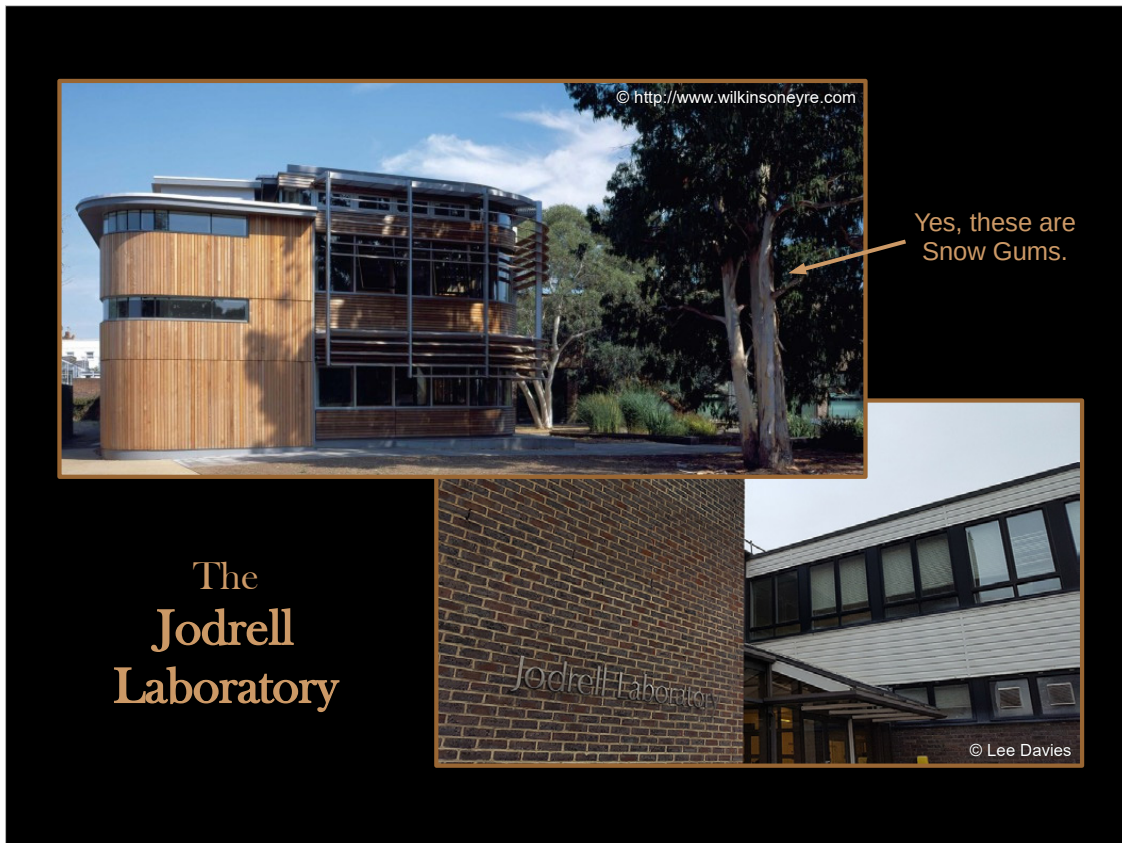
I'll start with Kew, as that's where we went first.



*Cyathus striatus*  
Found in Kew Gardens, London.

The main purpose of our visit to Kew was to photograph specimens of Birds Nest and Stinkhorn fungi to assist with my research on Queensland and Australian species.

I also hoped to learn a bit about how other Herbaria manage their collections.



Kew's Fungarium is housed in the Jodrell Laboratory building, which is located in a corner of Kew Gardens.

The Fungarium is made up of two departments - the Identification and Naming team and the Collections team.

I did get to meet a couple of the Mycologists from the Id and Naming team, but most of my day was spent working in the collections area with the Collections team.



(Left to right) Mrs Angela Bond, me, Mr Lee Davies and Dr Begoña Aguirre-Hudson.

And here they are:





Angela is the Fungarium's Collections Manager. Her duties include arranging and processing specimen loans and getting the agreement forms filled out for donated specimens. She also organises tour requests.

Lee is one of the Fungarium Collections Assistants. One of his many duties is to act as guide to the many tours that go through the Fungarium.

There is a third member of the Collections team who isn't in this photo, Shaheenara Chowdhury. She is also a Collections Assistant.

Begoña, here, is a member of the Id and Naming team. Her position is Assistant Curator and her main role is to re-curate and update the systematic arrangement of the collections and the indices.

## A Few Kew Fungarium Facts

-  1,250,000 fungal specimens.
-  60,000 species represented.
-  4,500 new specimens each year.
-  Research into taxonomy and systematics, conservation, plant health and ecology.

Here are a few facts about the Fungarium:

Kew has the most comprehensive collection of fungi in the world.

It is one of only several collections in the world that has a dedicated research team working with it.

It has, and this is a minimum estimate, at least 1¼ million specimens.

Those specimens represent at least 60,000 different species and this is estimated to be around 60% of the world's currently known fungal species.

Each year, approximately another 4,500 specimens are received and integrated into the collection.

The collection is used for research into taxonomy and systematics, conservation, plant health and ecology.

## Educational Displays



The Collections team receives more requests to borrow specimens from researchers all over the world than any other department at Kew.

Relative to its size, it also receives more visitors than any other Kew collection. Last year, they had a total of 44 tour groups go through.

These are a few of the things they have on permanent display in the collections area:

- some fungus themed posters;
- a collection of items made from fungal products;
- a sheep's skull covered with the tiny fruiting bodies of *Onygena equina*; and
- an assortment of fungi and lichen specimens. Most of the specimens are dried the usual way but a couple of them, like these, have been treated in some sort of plastic or resin to preserve them.



From what I understand, Kew looks after the UK's non-lichenised fungi collection – so that's the macrofungi and some microfungi species, and the British Museum of Natural History looks after the lichens. The Edinburgh Herbarium also deals mostly with lichens.

The collections at Kew are stored in two large climate controlled rooms that are situated beneath ground. One room holds the British specimens and the other holds specimens from the rest of the world.

Both rooms have work areas in them and the large mycology library is in the same room as the British collection.



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Ideally, Kew's specimens are stored in glassine packets put inside archival envelopes, which in turn are attached to botanical archival sheets.

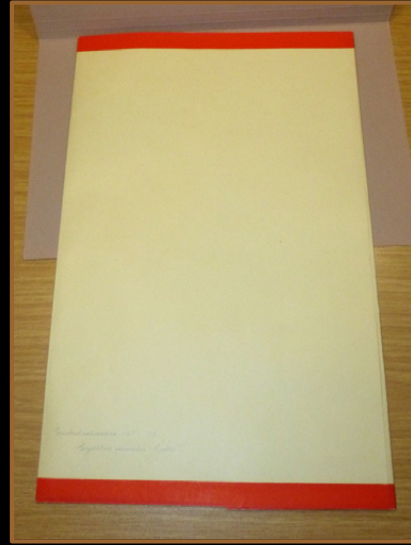
There may be a number of envelopes all containing the same species on a single sheet. The envelopes may come from all over the world and are placed in no particular order on the sheet.

The sheets are then stacked one on top of another and placed in folders for that species.

The folders are then put inside the distinctive green Kew boxes, which are stored on compactor shelves. There may be multiple species of a genus in the same box.

The boxes are arranged so that they run by genus name in vertical rows up and down from left to right.

You need a ladder to get to the upper boxes.



## Type Specimens

- 🔑 Stored with the other specimens.
- 🔑 Kept in red bordered folders.

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Type and other important collections are kept in the same storage boxes as the rest of the specimens.

To differentiate them, they are put into folders with a red border.

This practice was instigated during WW2 so that these special specimens could be easily identified and quickly evacuated if thought to be in danger.

One of the Curators during the war - Dr R.W.G. Dennis - also put a number of other specimens he thought worthy of saving into the red folders.

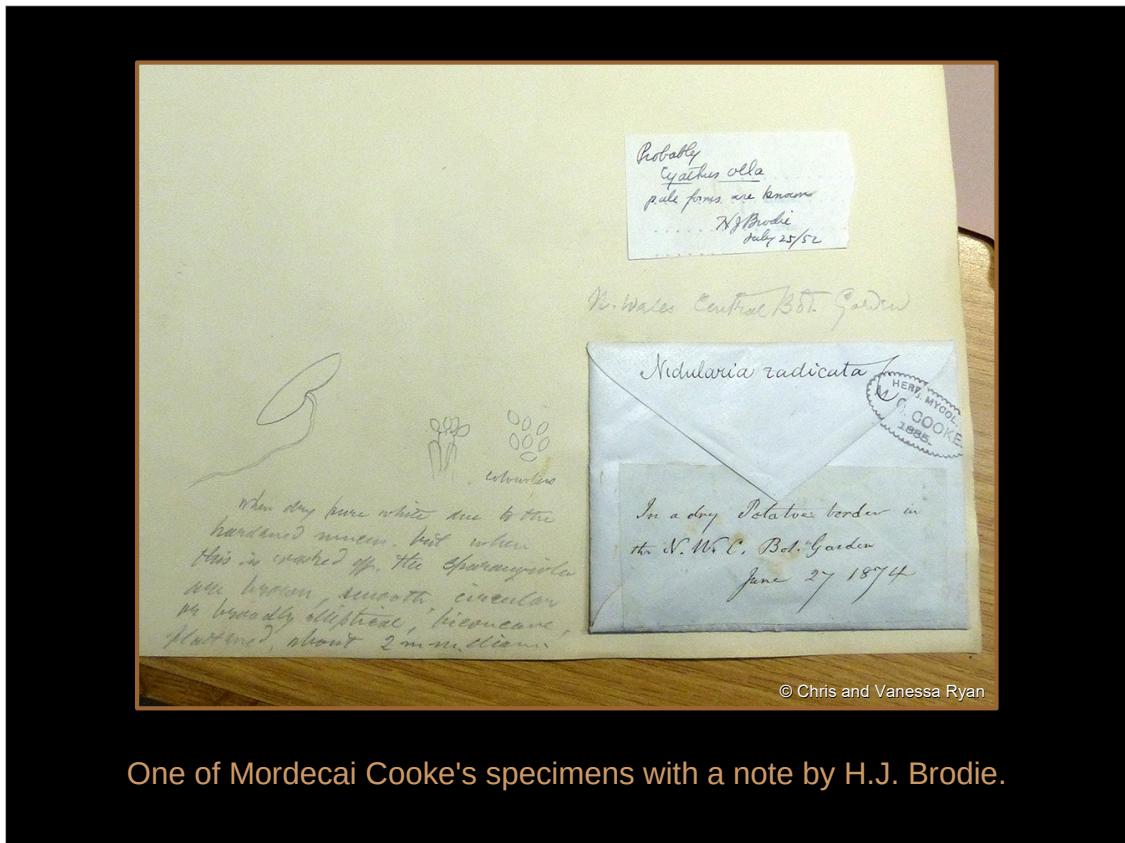
It was his way of protecting as much of the precious collection as he could.



Apart from the Type specimens, some of the fungi in the collection are very special from a historical point of view.

They include specimens collected by Charles Darwin in South America whilst on the Beagle and ...

...subcultures of Alexander Fleming's *Penicillium*. This is perhaps one of the most important fungal science discoveries in human history.



One of Mordecai Cooke's specimens with a note by H.J. Brodie.

Actually, the Collections area is filled with Mycological history.

While I was working, I came across notes written on envelopes and sheets by people such as H.J. Brodie - who literally wrote the book on Birds Nest fungi and D.M. Dring, who did the same for the Clathrate Stinkhorns.



I also came across specimens that had been pressed and taped or glued directly onto the archival sheets.

In the past, fungi were once considered plants and so they were preserved like plants. I think BRI might even have a few old specimens like this?

Most of the collections, like these two, didn't have much, if any, information with them.



And there are collections.

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A very few had detailed notes with them.

And some, like these stinkhorns, had useful watercolour illustrations of the fresh fungus.

Some of the collections were only one or two fruiting bodies in poor condition, others had lots of fruiting bodies in various stages of development.

I guess Kew's collection is much like BRI's, in that regard.



So that's a bit about Kew.

I had a good day there. The staff were all very helpful and friendly and Chris and I felt most welcome.

I gave them some QMS brochures and they gave me a brochure they'd produced about the fungi found in Kew Gardens and some of the work done in the Fungarium.



And now we skip along in time ten days and jump north about 500 kms to Edinburgh.

My visit to the Edinburgh Herbarium came about a bit by accident. I'd emailed one of the Scottish Fungus Groups with the hope of meeting up with some of the local amateur mycologists to have a chat.

You can imagine my surprise when the reply came from Dr Roy Watling, inviting us not only for a chat but also to a tour of the Edinburgh Herbarium.

For those who might not know, Roy's a highly respected Scottish Mycologist. He's done a lot of very important research and written a lot of books.



(Left to right) Mr Neville Kilkenny, Dr Stephan Helfer and Dr Roy Watling.

Two other Scottish Mycologists also came to spend the morning with us. They are Neville Kilkenny and Dr Stephan Helfer. Here they are with Roy.

Neville (on the left) is a volunteer Research Assistant at the Herbarium. He met Roy some years ago and got interested in fungi. The two men were given a grant which allowed Nev to do an apprenticeship with Roy.

Stephan (in the centre) is the Senior Scientific Officer in the Mycology and Plant Pathology department the Herbarium. He took over the position when Roy retired.

## Some Scottish Facts

- 🍄 Fungi aren't taught about in school.
- 🍄 There are amateur groups much like the QMS active across Scotland.
- 🍄 The groups are all affiliated with the British Mycological Society.
- 🍄 The members meet fairly regularly.
- 🍄 The fruiting season is April to November.

Before we began our tour of the Herbarium, we chatted about Mycology in Scotland and Queensland.

These are some of the things I found out:

As with here, fungi aren't taught about in Biology at school.

There are amateur groups much like the QMS active across Scotland. Each group looks after a region of the country. Stephan and Neville and, I think, Roy are active members of the Fungus Group of South East Scotland.

The groups are all affiliated with the British Mycological Society.

The members meet fairly regularly during the fungal fruiting season. This is sometimes twice a week.

And the fruiting season is usually during the warmer months of April to November.

- 🍄 Not that much is actually known about most Scottish fungi.
- 🍄 New species are still found.
- 🍄 Specimens are either sent to Edinburgh or Kew.
- 🍄 The groups submit species to IUCN for Red Listing.
- 🍄 Large areas of Scotland still haven't been looked at.
- 🍄 Many areas are deliberately burned at regular intervals.

Not that much is actually known about most Scottish fungi.

They still regularly find new species and these are usually sent to Roy.

Specimens are either sent to Edinburgh or Kew.

The groups submit species to the IUCN for Red Listing. Most of the species are classed “data deficient”.

Like Queensland, the most examined areas are around towns and national parks or reserves, with large areas of land between them that haven't been looked at.

Fire in Scotland is mostly on the moors and set by private owners who burn at will, usually in a 5 to 15 year mosaic pattern. This is for heather rejuvenation for creating the ideal habitat for Grouse hunting. Because of the long history of burning, Mycologists have no idea what the original species in those areas might have been.



I was given a very generous handful of brochures and booklets that the Herbarium has produced.

In return, I gave them some QMS brochures.



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So, after our chat, it was time for the tour.

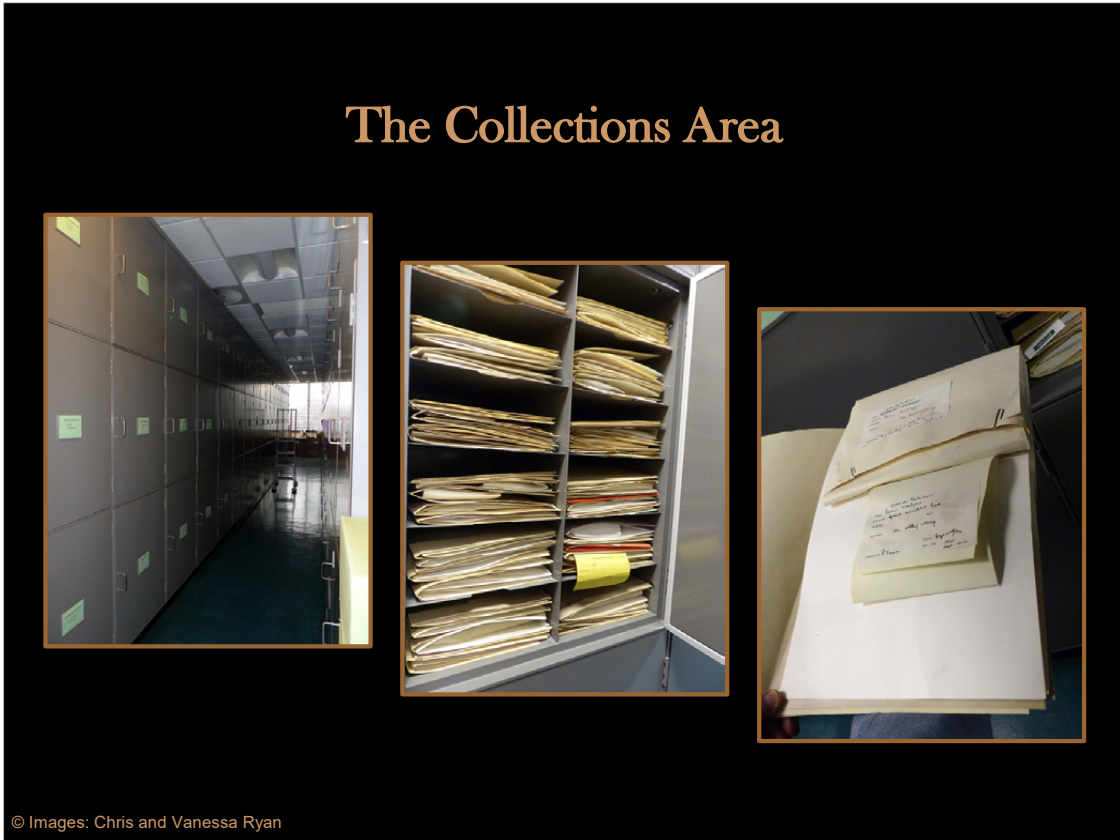
I guess before going any further, I should say a little about the Herbarium in Edinburgh.

It's located in an unimposing building at the edge of the grounds of the Royal Botanic Garden.

It has a long history, with its beginnings in the late 1600's with the private collections of the various Keepers of the Royal Gardens.

Roy told us the history of the Mycological collection. I wish I had recorded him speaking as it was very interesting. Like Kew, the collection has grown over time through a number of significant donations.

## The Collections Area



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There are estimated to be 100-120,000 fungus and lichen specimens in the collection. Roy is in the process of counting them.

The fungi and lichen collections area is quite large - consisting of rows of tall, metal cabinets. The cabinets are supposed to be fire-proof.

Inside them are piles of folders and inside the folders, as at Kew, are archival sheets with the packets holding the specimens stuck to them.

The Type specimens, again as with Kew, are stored in red-edged folders scattered amongst the other specimens. You can see some here.



Collection with watercolour illustration.

As in London, many of the specimens in Edinburgh are very special. For example, the collection includes many of the Swedish Mycologist Elias Fries' specimens.

We looked at some of the specimens. A couple of them, like this one – not one of Fries' by the way - had lovely hand-done watercolour illustrations with them.

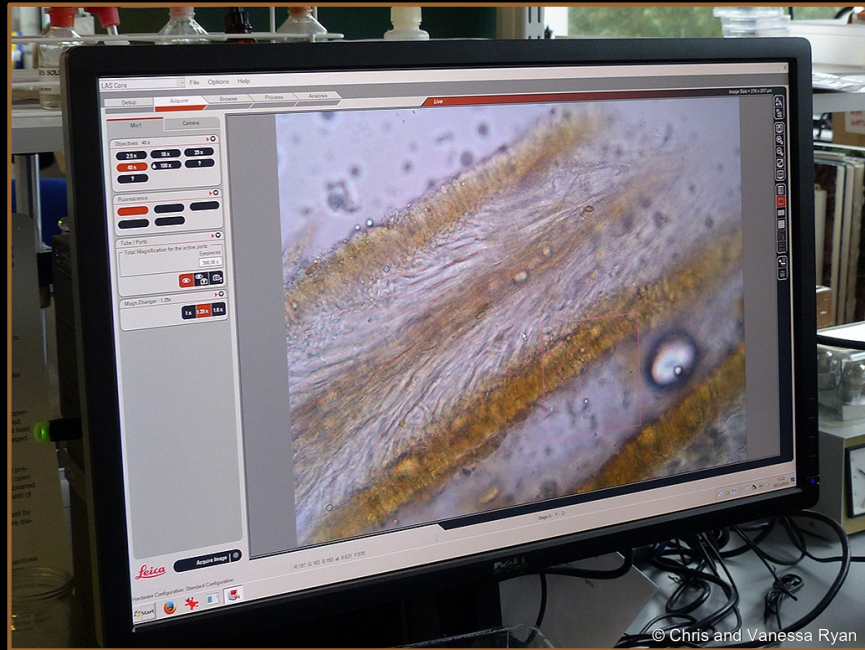
## Mycology Laboratory, Edinburgh.



Upstairs from the collections area is the lab.

It is quite well equipped and is in a large, airy and well-lit room.

Much of the space is now used by the Lichenologists, but the Mycologists still have a corner to themselves.



Sample of a toxic mushroom.

Nev and Stephan showed us a specimen that the team had been working on. It was from a food poisoning incident. The Edinburgh Herbarium gets 8 or 9 poisoning calls each fungal season.

The mushroom had been a part of a meal that had made a family very sick. There wasn't a fresh sample to look at, just the cooked mushroom mixed in with all the other ingredients.

The guys had managed to find a bit of the mushroom's trama and some spores and had worked out that it was some kind of bolete.

They think that it was actually an edible species that had been dried and sent from overseas by a well-meaning family member. Unfortunately, the mushroom had rotted before it had dried properly.



After the tour we still had half an hour left before lunch, so Stephan and Nev took us out on a quick foray into the Gardens.

The guys took us to their favourite tree and we quickly found some fungi growing beneath it.

Three of them were easily identified - *Clitocybe nebularis* Clouded Funnel, *Lepista nuda* The Wood Blewit and *Chlorophyllum rhacodes* The Shaggy Parasol.



We explored the gardens a bit further and found even more fungi - two different *Clavaria* spp., some *Geastrum triplex*, and a *Xylaria* sp. to name a few.

So that was the end of our time at the Edinburgh Herbarium and so I come to the end of my talk.

A final word from Kew...



In conclusion, I'd like to say that visiting these two Fungaria really brought home to me just what special and precious places they are.

It's not just about collecting, describing and naming species, or preserving and conserving the specimens. It's about making the world a better place through learning what fungi can do for us. Maybe they **can** save the world.

So, fungaria like Kew's and Edinburgh's, and yes, our very own BRI's, really are of world wide significance.

But ultimately, they are only as good as the collections they hold. So it's important that we, as collectors, do our best to provide good quality specimens with useful notes.

By doing that, we will be giving future Curators and Mycologists a priceless legacy.

Thank you.