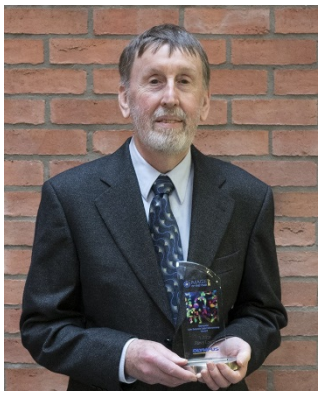

Dr Steve Lowry is our winner of the Olympus Image of the Year competition 2017 for his beautiful image of the skin of a sea-cucumber. We spoke to Steve to find out more about the image and how he created it.

Can you tell us a little about the image and why you chose it?
The image is of the skin of the sea cucumber. The sea cucumber skin has spicules – small needle-like anatomical structures – which are paired with a plate on an anchor. The anchor articulates on the plate so it can be slightly raised. The theory is that this may help to protect the sea cucumber from predation as the anchors stick in the mouth of a potential predator and make it unpalatable. The slide is an old Victorian or Edwardian slide – from when preparing this type of specimen was very popular with microscopists. They used to arrange the plates and anchors in patterns, rather than look at a whole piece of skin.

The reason I chose this image is because I had several images of arranged plates and anchors, but I was interested to look at a whole piece of skin to see the plates and anchors in their natural situation. After a long search I found a slide which had an intact piece of skin. They're quite rare – I think I've only found three in my lifetime, and this was the best one.

What technique did you use to create the image?
The image was taken using polarised light microscopy. The sea cucumber's skin is more or less transparent without the polarised light and I further modified the colours by using a wave retarding plate. I haven't put extra colours in though – only those created by the microscope. I tried to reproduce it as accurately as possible. As a general rule, if I can't do it on the microscope, I tend not to do it.

Can you explain your process for choosing and taking images?
As I get slides I pick out the ones that strike me as interesting and that would potentially create nice artistic images. Or I might work on a series of things. For example, I did a series on flower buds last year and I've done a series on sections of wood this year. The international gardening photographer award I won was for a portfolio of six sections of flower buds photographed through the

Spicules on the skin of a sea cucumber – a combination of polarised light and a wave retarding plate reveals the beautiful structure of the skin that provides the background for the sea cucumber's defensive structures.

microscope. When it comes to using the microscope, I find that a lot of different subjects work at the same magnification. My most used objective is the 4X objective. I occasionally go up to 10X or 20X, but I find that the lower magnification is often adequate to give you the images you want.

How did you get interested in microscopy?
I was always interested in looking at the fine details of things. When I was doing my PhD in zoology at Queen's I was researching intertidal woodlice called *Ligia oceanica* to try and find humidity receptors and this got me using both light microscopes and electron microscopes. Then later at Ulster University, most of my work involved scanning and transmission electron microscopy – based on the technique, rather than on a particular subject. That means I worked on mycology, diatom research and materials science – a whole range of different topics based around electron microscopy.

When did you first think about using microscopy for art?
About 10 or 12 years ago – I became interested in old Victorian microscopy techniques and polarised light microscopy, and I got a grant from the University of Ulster to create an exhibition based on Victorian microscope slides.

What's the biggest difference between doing this and research?
Probably the biggest difference is that when you're working as a researcher you're creating images that will have only a limited interest because of their scientific potential. Occasionally you might get something that is attractive or artistic but the interest is still in the information it gives rather than image appreciation. Now I've got the freedom to create interesting images. I do still produce images which have technical information rather than artistry but the thing that really fascinates me is producing images that have a bit of both.

Why the interest in old slides?
One of the reasons that I like working on this is because it's an archive that if people don't capture it now, is progressively going to disappear because many specimens will deteriorate over time. Having said that, I've been working with slides from the 1870s and some of them are still as good as the day they were made. One of the challenges with old microscope slides though is that sometimes the labels are missing and you've got to do a bit of detective work to find out what's on them. I quite enjoy that though.

Any ideas about what you could do with a new microscope?
I've got a collection of three dimensional objects which I haven't photographed, so a new microscope would give me an opportunity to go in a completely different direction – working with incident rather than transmitted illumination and exploring some macro rather than micro techniques.

More information: www.olympus.eu/imageoftheyear