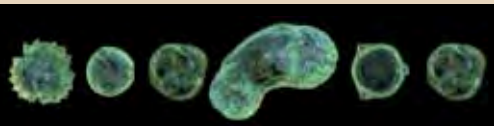
All sorted

The Classifynder – revolutionising pollen counting

Malcolm Wood writes.



Katherine Holt has seen a lot of pollen. During the four years of her PhD investigating past patterns of vegetation in the Chatham Islands, many thousands of grains passed under the lens of her microscope, each one painstakingly magnified, identified and tallied.

How much time did she spend identifying pollen? "Gosh, I have never sat down and thought about it. It's a bit depressing. I would spend weeks on identification."

What does pollen look like under the microscope? Amazingly various. "Beech pollen is like a thickened disc, a doughnut without the hole, and around its edge are around eight little slits. Its surface is slightly bumpy. Flax is triangular, with a reticulate pattern on its surface, almost like a honeycomb. I could talk for weeks and weeks about the range of shapes and sizes."

Nonetheless, tallying pollen counts is essentially scientific hackwork: at once meticulous and skilled, repetitive and mundane. Holt, nowadays a Massey lecturer in physical geography, will be pleased to pass it on.

Her rescuer is a digital microscope imaging, identification and pollen counting system, going under the name of the Classifynder, developed by staff from Massey's School of Engineering and Advanced Technology led by Emeritus Professor Bob Hodgson.

The Classifynder initiative began as a meeting of minds between Hodgson and Emeritus Professor John Flenley, who is perhaps best known for his work in employing palynology to map the human and ecological history of Easter Island.

"John Flenley looked at how to apply a computer to the problem of pollen classification and I got involved in applying specialist technology to come up with a product," explains Hodgson.

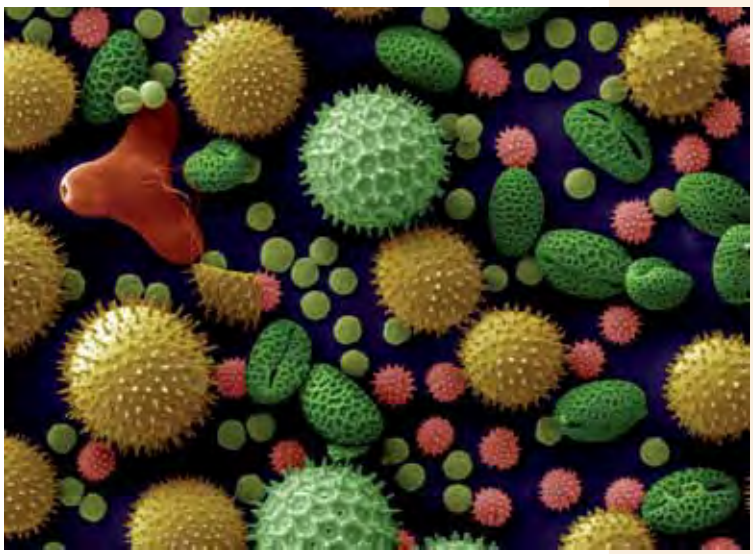
Now three generations on from its first prototype, the Classifynder is emerging as a commercial product: prototype machines are in use around the world. In Australia, the CSIRO (Commonwealth Scientific and Industrial Research Organisation) held an exhibition of images taken by the Classifynder to celebrate its purchase.

The Classifynder could end up widely adopted. The CSIRO, for example, intends to use it to identify how various insects and invertebrates function as pollinators within natural ecosystems. In biosecurity it can be used to identify the countries of origin of a range of products, notably honey. For allergy sufferers, it can establish airborne pollen counts and source species.

Does Holt wish she had been born just a few years later, so sparing herself all those hours at the microscope? No, for her it has been a privilege to play her part in the development of a new technology. It is the generation that is performing manual pollen counts in the period between the Classifynder's development and its wider deployment that she feels for.

In any case, she is not done with pollen counts just yet. Every day she returns to the microscope, but now it is to calibrate the accuracy of the Classifynder so that Hodgson and his team can tweak its performance.

"I want to check that it can deal with fossil pollen and broken pollen, things that pose some of the biggest challenges for automated palynology."



At top: Lecturer in physical geography Katherine Holt with the Classifynder and (inset) pollen grains as the Classifynder sees them. At right: Miscellaneous pollen grains (*William Crochot, Dartmouth Electron Microscope Facility*). Above left: Professor John Flenley. Above right: Professor Bob Hodgson.