

The fruits of imagination

The sciences and arts are often described as two separate cultures, but fruitful collaborations across this divide highlight the artificiality of such distinctions.

When Finnish artist Essi Kausalainen, during a residency at the Wysing Arts Centre in Cambridge, UK, asked a plant biologist what the most useful tool in their research arsenal was, she got a surprising answer: imagination. All of the data created, from the simplest, naked-eye observations to the most sophisticated (and expensive) techniques, are meaningless unless the researcher can create a mental model of the plant or other system to explain those data. As such, science is a highly creative activity, building plausible worlds on the basis of incomplete information and using imagination to fill in the gaps.

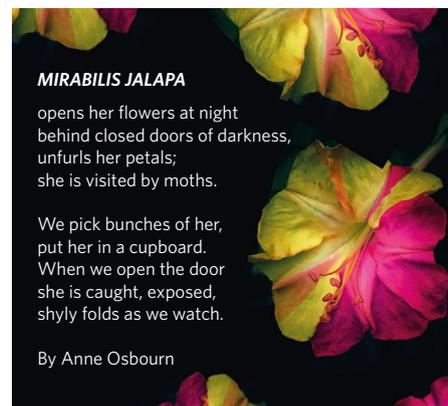
The divide between the sciences and the arts is far narrower than many people would believe. Indeed, it is relatively easy to argue that no division exists at all, that it is a wholly artificial construct of the culture we live in. Furthermore, scientists are in many ways more free to use their imaginative and creative faculties. An artist is constrained by the need for their work to be on some level believable, for it to connect with their audience. A scientist is required to constantly consider the unbelievable to determine whether it is in fact possible, probable, or even true.

The aim of *Nature Plants* is to take the broadest possible view of the plant sciences. Our remit stretches from the atomic-scale functioning of the biological molecules that make up plants, through studies that focus on molecular, cellular, organismal, multi-organismal, ecosystem and global scales. Nor do we restrict ourselves to any particular discipline of science, be it electrophysiology or economics, genetics or geopolitics. We would therefore be remiss if we did not on occasion also consider an artistic view of the plant kingdom.

With this sense of inclusivity, we are re-launching the Books and Arts section of the journal, with five reviews of five very different books. The first of these is firmly rooted in the world of plant biology, being the memoir of biogeochemist and palaeobotanist Dr Hope Jahren; her trials, tribulations and triumphs at the lab bench. The second is a superficially scientific-seeming flora — including glossary and dichotomous key — albeit

of a fictional place: J. R. R. Tolkien's Middle-earth.

Alongside these two long-form book reviews written by working scientists, which are the Books and Arts equivalent of a News and Views, we have three shorter reviews written by *Nature Plants* staff, and so more akin to Research Highlights. These include a look at the Colorado River, integral to the agriculture, ecology and communities of the American Southwest and yet abused and exploited to the point where its sustainability is in serious doubt. Another concerns the cultural and social significance of a number of trees that are either native, or at least very well known, to Great Britain. Our final review stretches the remit of the journal the most, as its subject is a work of fiction. Annie Proulx's new novel *Barkskins* follows the fortunes of two interlocking dynasties living and working in the timber forests of Canada, where the natures of the trees have as much effect on shaping the people as the loggers have on the trees.



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opens her flowers at night
behind closed doors of darkness,
unfurls her petals;
she is visited by moths.

We pick bunches of her,
put her in a cupboard.
When we open the door
she is caught, exposed,
shyly folds as we watch.

By Anne Osbourn

Credit: HR Johnson / Stockimo / Alamy Stock Photo

Elsewhere in the issue is a News and Views by Professor Anne Osbourn of the John Innes Centre in Norwich, UK, about the biochemical synthesis of two classes of plant pigments, anthocyanins and betalains, and why both are never found in the same plants. There is more than a hint of artistry in this News and Views, including its title: 'Painting with Betalains.' This should come as little surprise, as amongst Professor Osbourn's many achievements is the founding of the Science Art Writing

(SAW) trust, a charity that works to educate the public about science through art and writing (<http://www.sawtrust.org>).

SAW initially worked with primary school children, putting science to creative use in their classrooms, but its activities have expanded to include projects with teenagers focusing on the agritech industry, antibiotic use and synthetic biology. SAW has also developed a set of projects, collectively known as Lunchbox Science, to show children the links between science and agriculture by concentrating on different items that they would find in their lunchboxes. It also works with teachers in China and Africa to bring SAW elements to their classroom.

One of the best known betalain-producing plants is *Mirabilis jalapa*, the 'four o'clock plant'. True to her SAW principles, Professor Osbourn has written a poem concerning the plant (pictured); art inspired by science.

This brings us back to Essi Kausalainen. During her time in Cambridge, she became fascinated by mycorrhiza. This intimate symbiosis between plant and fungus is a relationship between two very different organisms, requiring recognition, a language of signals and responses, and a shared purpose. Through this interest she met Dr Uta Paszkowski of the Plant Science Department and, if their appearance on stage as part of Cambridge University's Festival of Ideas this October is anything to go by, became firm friends. The artwork that resulted is in no way an artistic representation of mycorrhizal symbioses, but a more conceptual exploration of how distinct entities can come together and negotiate collaborations.

When asked how her exploration of mycorrhiza had affected the way she approached her art, Kausalainen said that it had helped her to see how to change from an essentially solo artist into someone who now works more with others. This would be a good lesson for all of us, as science is an inherently collaborative endeavour in which the inspiration to imagine reality can come from anywhere. □

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