

A week in the plant life

If, as the former editor of *The Washington Post* Phil Graham said, “[journalism] is the first rough draft of history”, then it is sometimes worth looking back at recent news to try to identify the significant events among the noise.

History is just one thing after another. At least that is the opinion of Peter Rudge in Alan Bennett’s play *The History Boys*, albeit expressed somewhat more robustly. As a bald statement of fact it is difficult to refute, but that does not acknowledge the deeper structure of events. While it may be difficult to tell while they are happening, some things are more significant than others. But which? Even from the specialist viewpoint of plant biology, it can be interesting to look back on the very recent past and see what might be remembered and what is quickly forgotten. As an example, let’s look at the entirely ordinary week that began on 13 March 2017.

A great many pieces of research are published in a week, even in plant biology, but only a very small number get reported beyond the confines of the specialist literature. The biggest research news of this chosen week was probably the publication in *PLoS Biology* of fossils from central India, purporting to be not only the earliest known photosynthetic organisms, but the earliest eukaryotes¹. A team led by Stefan Bengtson, a palaeobiologist at the Swedish Museum of Natural History in Stockholm, studied fossils in 1.6-billion-year-old rocks using X-rays, revealing internal structures, such as a plant-like cell wall, that they believe identify the organisms as red algae. This would certainly be historic news if true as it would push back the endosymbiotic origination of chloroplasts by at least one hundred million years. But definitively identifying organisms from fossils is notoriously difficult and not all palaeobiologists are convinced.

Less controversially, but with more obvious practical benefits, was a paper out of Jeff Dangl’s group at the University of North Carolina at Chapel Hill investigating the responses of *Arabidopsis* to phosphate stress². They elucidated a mechanism by which plants respond to phosphate shortage by reducing the severity of their immune response, thus allowing greater colonization of their roots by soil microorganisms. The bacteria that take advantage of the more welcoming, or at least less hostile, attitude of the plants increase the uptake efficiency for what phosphate is present in the soil. In fact, soil inoculation experiments showed that the bacteria themselves are instrumental in increasing the *Arabidopsis* phosphate stress

response, encouraging the plant to see them as helpful allies rather than invading foes.

However, dominating the plant-related news were not detailed molecular studies, but rather reports on the effects of environmental variables on both wild and crop plants. A number of British environmental charities, under the umbrella organization Plant Link UK, brought out a report entitled *We Need to Talk About Nitrogen*, which alleged that almost two-thirds of wild habitats in the United Kingdom were being damaged by increases in nitrogen from fertilizers and industrial pollution (<http://go.nature.com/2ndo1X5>). Meanwhile, researchers from Zurich University in Switzerland showed that the current decline in European bumblebee populations could dramatically increase the rate of self-pollination of wild flowers, leaving them more vulnerable to diseases³. In the United States, the preoccupation was with the recent bout of cold weather and its potentially devastating effect on sensitive crops such as strawberries.

Perhaps none of these present and potentially parochial concerns will turn out to have historical significance. For that, we should perhaps turn our attention to the realm of politics. Here, a single plant seems to dominate, marijuana. This plant is little studied scientifically, despite its fascinating biology (see *Nature’s Outlook* on the subject: <http://go.nature.com/2nFZyvf>), but the current moves towards its greater legalisation, along with countermoves to limit such liberalization, are a constant source of stories and opinions in both local and national news outlets across the United States.

There is also the imminent confirmation of President Trump’s nominee for the role of US secretary of agriculture, Sonny Perdue. Perdue may prove to be one of President Trump’s less controversial nominees, garnering a degree of support from both sides of American politics. Nevertheless, this former governor of the state of Georgia has interests in large-scale agribusiness, which meant it took a full seven weeks to assemble the requisite financial disclosures to support his candidacy. In fact, Perdue’s involvement in global agricultural trades, such as grain exporting, may make him one of the most outward looking of an increasingly protectionist administration.

This third week in March also marked some beginnings and endings. One beginning was the announcement by the American Society of Plant Biologists and the Society for Experimental Biology of a new journal, *Plant Direct* (<http://plantdirectjournal.org/>). *Plant Direct* promises to be a little different from the journals that exist at present. It will be a ‘sound science’ journal, that is a journal with no criteria for novelty or significance, only focusing on accuracy of both execution and description of scientific studies. However, unlike previous journals of this kind, such as *PLoS ONE* or *Scientific Reports*, *Plant Direct* is intent on providing a service for the specific community of plant scientists. The model for the ‘society journal’ of the future?

The week’s saddest news was the death of André Jagendorf on 13 March, aged 90 years. Jagendorf is not perhaps the household name that he should be, even amongst plant biologists. He was one of the generation of biophysicists who from the 1950s onwards did so much to construct the foundations of modern biology. Working at Johns Hopkins University and Cornell, he investigated first the basic processes of photosynthesis, providing in 1966 the first unequivocal support for Peter Mitchell’s chemiosmotic mechanism for ATP synthesis⁴, and later the molecular biology of chloroplasts. He was an imaginative, ingenious and meticulous experimentalist with a great love of jokes, with which he peppered all his conversations and correspondences. Although Jagendorf became a professor emeritus in 1997, he continued active research until a few weeks before his death. It is hoped that he was able to complete the experiments he was working on.

The week of 13 March 2017 is no more remarkable or mundane than any other. It does, however, demonstrate the concerns that continue to shape the future of plant science. Environmental fears and agricultural imperatives; political ideals and vested interests; remembrances and aspirations. Such are the threads from which history is woven. □

References

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