

Tim Payn

Nothing lasts forever – so says Sebastian Klinger in this issue's *Last word*. This is particularly relevant in today's fast-changing world, I don't think there has been such a rate of change in so many things in human history as today – this has been termed the 'Great Acceleration', and the epoch the Anthropocene, reflecting human's impact on the planet. This issue of the journal takes a future-focused look at some aspects of forestry in Aotearoa New Zealand.

I've always personally had an eye on the future. Dreaming of what might be: anti-gravity logging machinery, terraforming and afforesting Mars, or breeding square trees for ease of processing. What can we dream of for our forests? Creative and visionary people built New Zealand forestry – we stand on the shoulders of giants. Who are our giants of today, or more importantly the giants of tomorrow, who will take our forests to the next century? What will they need to get us there?

We have come far: from the Royal Commission in 1913, recognising we could not continue to depend on our indigenous forests; through the radiata pine task force that developed the first intensive plantation forestry management systems; to, more recently, transformational harvesting technologies for the 65% of our plantation harvest that comes off steeplands. We are also at the cutting edge of forest conservation with a global reputation based on refugia (pest-free islands), whether on or offshore. This creativity and thinking has had a massive national and global impact.

So, what's important for the future of our forests? People and passion first and foremost. In the last few years, we have seen the emergence of a whole raft of initiatives aimed at younger people and informing and educating them about forests, forestry and careers. Alfred Duval of Future Foresters outlines their vision in this issue, the NZIF Foundation encourages students through awards (please donate today) and other groups (such as the WIDE Trust, Te Uru Rākau – New Zealand Forest Service) and the regional Wood Councils are very active in school programmes, scholarships and internships. Young people are the future, and we need to excite them about forests, which after all make up around 31% of both our terrestrial landmass and the planet's land cover.

Understanding forests is second – they are living breathing entities and far more complex than most people know – read Peter Wohlleben's great book *The Hidden Life of Trees*. Trees talk to each other! We do tend to have a simplistic view of forests – 'Oh it's just an exotic plantation.' That plantation depends on a complex ecology just as tropical rainforests do –

microbes, fungi, bacteria, insects, plants, animals, birds, trees all interacting. Let's teach our kids (and their parents) about ecology and how all living and non-living things fit together in a forest.

Then technology – the AI revolution and the Internet of Things – have turned forestry on its head. It's so easy now to do things on a smart phone, with no need to visit the forest. Dial up a satellite, download tree locations to your phone and off you go to do some wilding control, as we have been doing on a friend's block of regenerating forest recently. Technology opportunities are huge, and Claire Stewart and Robin Hartley give us a perspective on some of these.

Biotechnology and genomics to rapidly accelerate breeding programmes are covered by Mark Paget, another game-changer, as are the new nursery technologies outlined by Sebastian Klinger. Looping back to education and training though, one of the most exciting technology advances I've seen recently is the use of virtual reality for training. Toi Ohomai Institute of Technology has pioneered training for forest machine operations on video-based simulators, dramatically shortening training time – and also very attractive to a generation of young people raised on video gaming. This recognises the importance of mechanisation and health and safety in the forest. Toi Ohomai is about to double their capacity with the commissioning of a container-based mobile facility to reach students in remote areas. It's not a great leap to remotely operated machinery, allowing people to live far from the forest.

Other papers in this issue reflect the future and recent advances moving us ahead. Jason Wilson outlines the vision of a transformed forestry sector in a rapidly changing world and Te Uru Rākau – New Zealand Forest Service's role in this transformation. Glen Murphy looks at opportunities from automated log tagging to improved production efficiencies as part of the push to develop innovative harvesting technologies in forestry automation and robotics. Volga Lipwoni and colleagues at Scion and the University of Canterbury put forward new ways of estimating tree heights from 3D LiDAR point clouds he developed in his Masters programme, an exciting part of the revolution in forest inventory.

I will finish by reflecting again on our giants of forestry. Professor Geoff Sweet's obituary is in this issue. He was Prof at Canterbury when I was there – a gentleman and a scholar who had an eye on the future and those who would steward it.

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