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ATA Scientific Travel award entries Nov 2013

1/ Name and Title: **Jeff Kelleway**, University of Technology Sydney

My colleagues and I study the flow of carbon and nutrients in aquatic ecosystems. During a field campaign along the Murrumbidgee River, near the end of a drought, we found that our floodplain wetlands had completely dried out. There was no water. No fish. These were the things we had travelled 12 long hours to sample and study. We weren't about to turn around and head home with our tails between our legs though. Scientists need samples - we needed to find something new to study! We looked around. The floodplain was still and seemed devoid of life. The birds had long since left. Even the frogs and snakes had gone looking elsewhere as the wetland dried out. In the distance we saw a mob of kangaroos resting in the shade of the river red gums. We looked down around our feet. Eureka! We were standing in poo! Lots of glorious kangaroo poo, full of energy and nutrients! We snapped on the gloves and started picking up scat after scat, until we had bags full of the stuff! Back in the lab we learnt how to distinguish scats of different kangaroo species. We crushed them up, analysed them for elemental composition as well as carbon and nitrogen isotopes. By comparing the 'signatures' of the scat isotopes with those of food plants on the floodplain we were able to investigate the role kangaroos play in energy cycling in floodplain ecosystems. We have since published our results, which show that kangaroos are important recyclers of energy within a floodplain, meaning that when droughts break, this material is washed into the rivers where it provides the energy required by a thriving aquatic food web! Serendipity in science is finding yourself standing in poo, just when you need it most!

2/ **Dr Shih-Ping Su**, University of Sydney

I sincerely believe in serendipity in Science. An example of how a stroke of unexpected good fortune occurred during the last year of my Bachelor of Biotechnology degree; I was completing an Honours project involving the characterisation of endogenous metabolites present in a rare moss species found in Antarctica (one of the very few species of plants able to survive in the continent). I wasn't finding anything particularly interesting so I was prepared to just write up the results I've got and just get the Honours thesis done with. However, as I was working in a Medicinal Chemistry laboratory that was focusing on anti-HIV drug development, I decided to give our collaborators a few samples of the metabolites that I've extracted from moss to test for anti-HIV activity – you know, just for the sake of curiosity. The result that they sent back to us about two weeks later stunned myself, my supervisor and the whole laboratory; two of the samples I provided them had

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extraordinary high activities against HIV, more so than any compounds the laboratory had ever produced. This result then set off a string of subsequent follow-up projects for the research group I was working for, to further purify and analyse this compound, with the aim to one day be able to produce an anti-HIV drug from these moss metabolites that I have extracted. So yes, I sincerely believe that luck does play an important and somewhat underestimated role in Science, after all, we are only human.

3/ **Mr Robin George Andrews,** University of Otago

Geological mapping: a blend of unbearably breathtaking scenery and days on end spent looking for a very specific, very dull mineral deposit. Swings and roundabouts, I suppose. 'Why did you get into volcanology, by the way?' I asked my supervisor, the two of us standing atop a rather steep, ancient volcanic mound in Arizona. His answer was something of a non sequitur. 'Rattlesnake,' he said. 'What?' 'There's a rattlesnake right next to you,' he said, before performing a sort of evasive moonwalk. Looking down to my left, I noticed a poised to strike rattlesnake, examining me. I slowly rotated myself, and, for reasons I could not elucidate on any further, I mimicked my supervisor, and panic moonwalked out of the way. Unfortunately, I took this panic moonwalk slightly too far, and moonwalked off the cliff. I don't know if you've ever fallen off a cliff before, but it tends to hurt, mostly thanks to the gravitational field that Earth selfishly exerts on all of us. I smashed into a plate-like rock jutting out of the cliff, fell down another few metres, and then rolled unceremoniously down a slightly bumpy, spikey slope. After about thirty seconds, I stopped. I could twitch most of my muscles during a quick systems check. The congregation of volcanologists stood at the precipice of the cliff above me like a silhouetted audience of giggling, unconcerned monkeys. I reached behind my head, explored the strangely soft mound with my fingers, and grabbed some of it; bringing it forward, I poured the black crystals over my chest, and flumped back, my eyes staring up at the volcanologists above. 'Pyroxene?' my supervisor blared down the cliff face. I nodded. Is there serendipity in science? Well of course there is: discoveries are often stumbled upon – in some cases, quite literally.