

## **Here, there and everywhere: the COVID-19 lockdown, bedroom bughouses and rise of the backyard bioblitz**

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In mid-February, as my latest teaching contract at Lincoln University approached its end, COVID-19 was a very distant problem. Only a week or so later and COVID was a very real and much closer problem as hundreds of Chinese students started returning to Lincoln from their combined Christmas break and Chinese New Year celebrations. As March began, the scale of the pandemic became global and personal. All China Southern Air flights from Christchurch through China were cancelled, and, as a consequence, my flight to Ireland via Guangzhou no longer existed. A week after arriving in Ireland, using a rearranged flight via Dubai, the Irish government initiated unprecedented actions: schools were closed, six nations rugby was postponed, and, as a potent symbol of the perceived threat, Dublin's St Patrick's Day parade was sadly cancelled.

As with higher education institutes around the world, undergraduate teaching at Trinity College Dublin moved online and new distance-learning formats were initiated. One by one, global conferences and local meetings were cancelled or postponed, culminating with our own Society's decision to cancel our annual meeting planned for Dunedin. Work restrictions were imposed, and we slowly entered the brave new world of mass 'working from home'. Initially, colleagues mused this might represent a substantial opportunity, offering vast expanses of unimagined 'free' time for finishing the backlog of papers, identifying the backlog of

specimens, and submitting the backlog of peer reviews. There was even the possibility of slipping in a few funding applications along the way.

For some scientists, however, this caused a slight dilemma as writing is not the most enjoyable component of their work, and days of writer's block and staring at a blank page can be as stressful as it is frustrating. When faced with a situation where other work is impossible and writing seems the only option, one way to avoid doing any actual writing is to start reading about how to do writing. Properly. The big online MOOC providers, such as Edx.org and coursera.org, allow us, at no cost, to develop our academic writing skills at Berkeley or brush up our English grammar at the University of Queensland. For the ambitious there are even masterclasses in scientific publishing provided by *Nature* (masterclasses.nature.com). Writing guides are themselves diverse, and range from self-help books coaching you towards an implausible 5000 words an hour (Fox 2015) to trimming down our flabby text or adding flair and panache to our dull and prosaic academic prose (e.g. Sword 2012, 2016).

A common theme of these books, including Stephen King's *On Writing*, is that an essential element of the writing process is a place of seclusion, where the author can focus, the door can be closed, and all disturbances, both human and electronic, can be blocked. Unsurprisingly, for many, the divine solitude and serene idyll of the imagined home writing retreat was replaced fairly rapidly by the screaming reality of the full house under lockdown. Although the academies fully endorsed working-from-home, they did not openly recognize the seemingly endless meal preparation and home schooling that now competed for our attention, or acknowledge how the adoption of traditional gender-aligned domestic roles could disproportionately disadvantage female academics (Minello 2020). The hope of the COVID-created sabbatical slowly waned, replaced with mild despondency as another aspirational to-do list remained unticked, abandoned to a succession of multi-partner email conversations and strength-sapping Zoom meetings.

On the plus side the first New Zealand lockdown was relatively short. In Ireland and the rest of Europe, however, researchers and post-grad students were faced with long-term laboratory closures, travel restrictions, and the loss of a whole season's worth of precious field data (Cornish & Barbic 2020; Paterlini 2020). For some fortunate entomologists, a dedicated home study already exists, complete with professional microscope, burgeoning shelves of identification keys, and the pins and pots needed for specimen perusal. For the rest of us without the space (or spousal permission) to spread our entomological tools, a newly recognized domestic area came into existence, widely referred to as the 'isolation station'!

In these unique times, sheds, spare rooms, dining-room tables and cupboards-under-the stairs have all been lovingly converted to allow the continuance of entomological research and specimen curation (Fig. 1). My personal isolation station was designed specifically for the rearing of solitary bees. Last spring, I set up artificial bee nests containing cardboard tubes at 16 Irish farms. The tubes were of five diameters and set at three heights to see how this affected occupation by different species of bees. As the summer progressed, the ends of the smaller tubes were blocked with mud and clay, whereas the larger tubes were sealed with discs cut neatly from nearby nettles. By the end of the summer over 300 tubes had been sealed and were then retrieved and stored in an outside storage facility to overwinter. In March this year, just as the bee emergence period was about to start, I received an email from Trinity College saying it would be closed to all staff from 5 pm that day. Immediate action was called for.

"I need to pop into work and bring some stuff home"

"I hope it's not hundreds of dead insects as usual"

"Nope"



Fig 1. From Lucan to Lincoln. Dr Stephanie Maher, a research entomologist at Trinity College Dublin, and John Marris, curator of the Lincoln University Entomology Research Collection, provide fine examples of converting spare bedrooms into multi-functional, ergonomic, entomological study facilities. John's Great Grandfather looks on...

So began the thrice daily routine of ‘checking the bees’ to see what and how many insects emerged from each individual tube. To make things simpler it was deemed necessary to commandeer the entire surface of the spare bed to arrange the tubes, and attempt to maintain some scientific integrity by measuring the minimum and maximum temperature each day. After three months a sizable collection of mason bees, leaf cutter bees, and potter wasps, along with a whole suite of parasitoid Hymenoptera and Diptera, had been obtained (Fig. 2). The process was so successful there is now an issue about how, for consistency, we repeat the rearing process in future trials.

Citizen science recording was another activity that has blossomed during lockdown. Researchers, conservation initiatives and recording groups all urged the cocooning populace to use their enforced free time to engage more with nature and submit their observations to national biodiversity centres and global recording initiatives ([bbc.com/news/uk-wales-52414876](https://www.bbc.com/news/uk-wales-52414876)). iNaturalist ([www.inaturalist.nz](http://www.inaturalist.nz)) encouraged people to take part in ‘stay-at-home’ 20-minute challenges to record as many birds, lawn plants, and even lichens in the allotted time ([inaturalist.nz/projects/stayinathome-nz/journal/33950](http://inaturalist.nz/projects/stayinathome-nz/journal/33950)). Jon Sullivan, a Senior Lecturer at Lincoln University, and trustee of iNaturalist NZ-Mātaiki Taioa, reported a huge increase in records received during lockdown. In an RNZ interview, Jon reported there had been over 16,000 observations involving over 3000 species uploaded in the first three and a half weeks of the Covid-19 national lockdown, a 40% increase compared with the same time last year.

As more people had more time to explore their gardens, it seemed inevitable that things would start to become competitive. The Otago branch of the Entomological Society launched their own “Invertebrate Isolation Initiative”, with prizes awarded for most observations, most species, and “coolest beetle”. Jon Sullivan also decided to use the lockdown time to increase the species inventory for his own back garden, aiming to add a new species each day. When NZ moved to Level 3 on 23<sup>rd</sup> March his tally was 401 species, increasing to 424 by 17<sup>th</sup> April when he was interviewed on the Jesse Mulligan Radio NZ show, and an impressive

515 by June 8<sup>th</sup> when NZ was declared (temporarily) case-free. Another Lincoln University entomologist, Mike Bowie, informed me his own back garden inventory had reached a more modest 268 invertebrate species through his lockdown recording activity. Nevertheless, with Jon's longer list containing non-invertebrates, I am still unsure as to whose Canterbury backyard is the entomologically superior. Maybe Mike will set the story straight, or at least formalise the challenge, in his aptly named 'Backyard Critters' column of the *Selwyn Times*?

For some really serious citizen science, the iNaturalist City Nature Challenge, which coincidentally ran over the Anzac Day weekend from 24-27<sup>th</sup> April, involved three New Zealand cities - Auckland, Christchurch and Dunedin - in a global recording bonanza: 12,000 records were submitted in NZ, and over 800,000 around the world. Entomological biogeographic data obtained from citizen science projects is now a significant tool in the assessment of long-term trends in insect abundance and distribution, especially in countries such as New Zealand where baseline data for many groups remains lacking (Hodge 2020). This huge boom in records, obtained over such a narrow time period, will surely be of considerable value, both now and as baseline data for comparison with similar intensive recording events held in the future.

There was only a single COVID case in New Zealand when I left in March. Back then I had not the slightest inkling that the global death toll would pass one million before the year was out and that COVID restrictions would still apply in many parts of the world. For those not directly affected by the pandemic, even with the saturation of news and social media, the magnitude of events can still seem distant, and the crisis reduced to a resigned 'soldiering on'. In New Zealand, we can be thankful that things are looking good once again, the field work is recommencing, labs are being opened, and the students are back in class. This scenario might currently seem inconceivable for many of us, but at least gives hope that our eventual 'new normal' might look a lot like the old normal given time. Until then, I am keeping the bedroom bee room safely on hold.

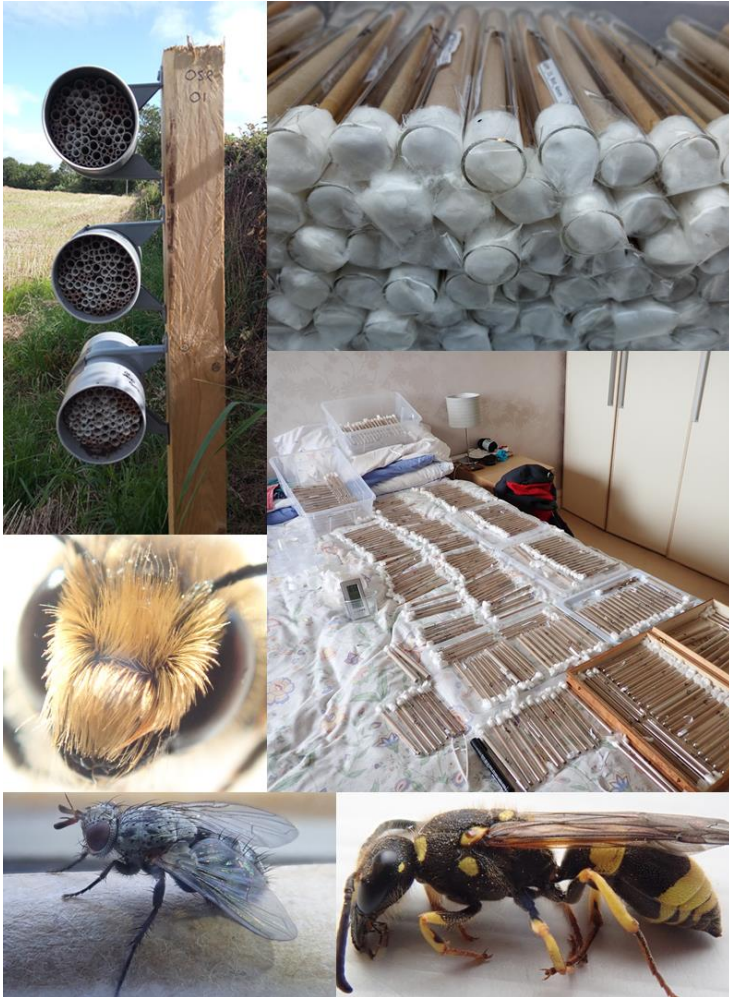


Fig 2. The story of a field study on cavity nesting bees. From top left clockwise: cardboard nesting tubes were placed out at three heights at 16 different Irish farms and left in place from March to September. Nests were retrieved, each occupied tube placed into an individual glass casing tube and then maintained horizontally at room temperature. Emergents were collected daily and included potter wasps (Vespidae: *Ancistrocerus* sp.), a dipteran parasitoid of earwigs (Tachinidae: *Triarthria setipennis*) and leaf-cutter bees (Megachilidae; *Megachile versicolor*).

### Acknowledgements

The author thanks all the farmers who allowed access for the bee study, Irene Bottero for field assistance, and the EU Horizon2020 ‘PoshBee’ program for funding. Thanks to Steph Maher and John Marris for their home photos, and Steve Downes and Stephen Boulton for identification of the tachinid and vespid specimens. Finally, the author expresses his appreciation of Melissa Else for her calm toleration of the ‘bedroom-bee room’ for seven months. And counting.

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