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Make Open Science your New Year's Resolution

by Freddie Theodoulou, Science Editor

Let's face it, 2016 brought with it many challenges and uncertainties for science. First came the political events that set the UK on the uneasy path to leaving the EU. Then, while Remainers and Brexiteers alike were reeling from this bombshell, we woke up one morning in November to discover that the US had elected Donald Trump as its next President. Concern has been expressed within the scientific community at his choices of climate-change sceptic and anti-vaxxer advisors. As we go to press, Academic Twitter is expressing further unease at the administration's temporary move to ban government-funded scientists from sharing scientific information on social media. Although the full implications for science of Brexit and the Trump administration remain to be played out, if new immigration policies dictate the restriction of movement of scientists, a negative impact on the global scientific community seems inevitable.

It's an emotional response, but the world suddenly feels smaller and more insular. While we may not be in a position to influence immigration legislation, one positive way to make a difference is to support Open Science. The Open Science agenda aims to change the way that science is conducted and encompasses open access, open data, research metrics, citizen science and research integrity. In this spirit, throughout 2017, *The Biochemist* will be taking a look at citizen science. As discussed in David Pye's article on page 44, there are several definitions of citizen science, but engagement of the general public in scientific research is the common theme. This isn't a completely new idea: from the Renaissance to Victorian times, science was a favourite leisure pursuit of the independently wealthy middle classes, with well-heeled ladies and gentlemen collecting fossils, gazing at the solar system, cataloguing plants and observing animal behaviour. A lecture at the Royal Institution was considered a good night out, on a par with the latest play or opera. However, there was more to this than keeping a small section of the population entertained: the endeavours of gentleman scientist Charles Darwin gave birth to arguably the most important and influential theory in biology.

Since the early 20th Century, the practice of science has – rightly, some might assert – become the preserve of professionals, with formal frameworks for training, dissemination, quality control and safety. But in a society that claims to be tired of 'experts', are we unwise to exclude the enthusiastic amateur? Modern citizen science is distinguished from its Victorian forerunner in two significant aspects: crowd sourcing and democratisation. It also straddles national boundaries. However, whilst natural history topics such as animal migration are particularly well served by citizen science, it is a moot point whether this model works equally well for molecular bioscience research. Virtual games such as the protein structure solving app, FoldIt have been hugely successful and neatly circumvent the challenges of amateur lab work. Meanwhile, the emerging field of garage biotech continues to create controversy, provoking bioterrorism fears, but has also been hailed as a hotbed of creativity akin to Silicon Valley in the 1970s and eighties. Could the next Darwin be dabbling in a little synthetic biology at the weekend? Amid the hype, there is still much to discuss and debate. Perhaps we should make the pursuit of Open Science our New Year's Resolution? ■