

Editorial

New ways of recognizing the contributions to research

In any field we expect to be recognized for the work we do, and for that recognition to be fair and even-handed. Over many years the science community has developed a system whereby a scientific contribution to knowledge is generally recognized by authorship of a published peer-reviewed paper. Once upon a time papers had a single author, but in the 21st century that is now a most unlikely scenario in most branches of science. So, with multiple authors who goes first and how is the credit shared? The convention has been that the person who actually undertook the research – be it student or senior researcher – should head the list, but in some laboratories it is the supervisor who wants first place, whilst in others the Head of Department puts his name to every paper from his group regardless of his input. And in these days of team research across disciplinary boundaries can we actually say with confidence the first author is the most important? Whilst some articles with many authors have resorted to alphabetical listing this does not really help with the problem of attributing credit fairly and openly.

To counter this, many universities and scientific societies have developed guidelines for attribution, and these worked reasonably well until the growth of massive international teams for major projects. The paper on the Higgs Boson had seven pages of contributors but failed to answer the question what did they all contribute! Since authorship and specific indices, like the *h* factor and citation rates, are crucial to successful grant applications and promotions, crediting people correctly for their contribution becomes a serious matter. *Antarctic Science* took the first steps down this path when we required all authors to make a generalized contribution statement at the end of the paper.

More, however, is really needed as we move into the future. The standards organization, CASRAI (Consortia Advancing Standards in Research Administration Information, <http://casrai.org/CRedit>), has been busy developing a new taxonomy of the various contributing roles encompassed in authorship and has come up with 14 categories. These stretch from the conception of the idea and the formal design of the study, through the experimental work and the data analysis to the writing of the manuscript. But they also include the data management, supervision, project administration and funding acquisition. Of course, there are still potential problems in agreeing who falls into which category, how important each element is, and what constitutes equal roles. The trials so far have been in the biomedical and life sciences communities so there is the need for wider trials to see how generally these can be applied.

Alongside this the major science publishers have developed the ORCID digital identifier (<https://orcid.org/register>) to allow every researcher to have a unique marker across all journals and grants which enables, for example, funding agencies to draw down a complete picture of individual outputs without the complications you get in SCOPUS and Web of Science with common surnames. Meanwhile the CrossRef Open Funder Registry (<http://www.crossref.org/fundingdata/>) is increasingly allowing interested parties to see just what research has come from specific grant initiatives, contributing to a greater transparency in outputs than has been possible before.

All these new tools are still under development and will take time to be absorbed across the whole scientific community worldwide, but they are innovative uses of modern technology to allow the accurate attribution of ideas and efforts to individuals. Whilst this is unlikely to guarantee 100% happiness it will go some way towards making it a fairer world. *Antarctic Science* will be adopting them.

D.W.H. WALTON