Solo scientist

Researchers who work for themselves can benefit from forming coalitions that provide both practical and psychological support.

BY AMBER DANCE

In 2012, academic life was going well for archaeologist Jeffrey Rose. Employed by the University of Birmingham, UK, but working in Oman, he had found stone tools that provided on-the-ground evidence for human migration out of Africa. He had also just been named a National Geographic Emerging Explorer, an accolade that came with funding.

But in the same week in which Rose attained the award, he received an e-mail from his university. It was closing its institute of archaeology and he was out of a job. “Essentially, I got shipwrecked,” he recalls. “It was awful.”

By then, Rose had fallen in love with the landscape and people of Oman, so he let his academic job search fizzle out after a couple of disappointments. “Deep down, I didn’t want to be part of academia,” he says.

Instead, he cobbled together a living from diverse projects: hosting television programmes about archaeology, mythology and religion; conducting archaeological surveys for oil companies; and writing a book for the government of Oman. “I was surprised I could make a living doing archaeology outside of a traditional university,” says Rose.

He is among a number of scientists who are doing science without the benefits of a conventional, bricks-and-mortar employer, and who are starting to band together for mutual support. Although there are no comprehensive data on how many scientists worldwide take the freelance approach to research, at least two virtual institutes have formed to provide scientists with an affiliation and network of support. One is the Ronin Institute for Independent Scholarship, which has accumulated more than 100 members since it was established in 2012. About three-quarters live in the United States, says founder Jon Wilkins, a theoretical evolutionary biologist who lives in Montclair, New Jersey. He named the institute after the Japanese samurai who worked independently, instead of pledging themselves to a master. In the United Kingdom, a similar virtual institute called CORES Science and Engineering was formed in 2014.

Some scientists are forced into independence by a lack of jobs in their field or in the location in which they wish to live. Although others...
Scientists in countries without universal healthcare may have to pay for medical care. They are decamp owing to their disillusionment with academia, the pool of freelancers also includes retired or emeritus researchers.

**ANOTHER WAY**

Working independently gives researchers the freedom to pursue projects that interest them, whether as a full-time job, a part-time vocation or a hobby. However, independent scientists must contend with an uneven stream of income, the potential for loneliness in the workplace and the absence of the prestige that an institutional affiliation can confer (see ‘The pros and cons of going solo’). Not working for a conventional research organization can also prevent researchers from being able to apply for certain types of grant, and some worry that their papers are less likely to receive fair reviews. To do well as an independent researcher, it helps to know how to write a successful grant application and to have honed networking skills.

“What I do on a day-to-day basis is not that different from what anybody in a more traditional academic position would do: read papers, write papers, apply for funding, work with collaborators,” explains Wilkins. He decided to go it alone in 2011, after a six-year term at the multi-disciplinary Santa Fe Institute in New Mexico. Wilkins did not want to work in a department that focused purely on biology, and he thought that a tenure-track position would force him to work on ideas that were fundable rather than exciting. Now, he performs mathematical and computer modelling of biological concepts such as population genetics and genomic imprinting, and also works with collaborators. His salary is made up of funds from the US National Science Foundation, donations received by the Ronin Institute and fees for consultancy work.

Self-employed scientists say that their career path offers a potential solution to the glut of trained researchers with PhDs in a tight job market. The number of PhDs awarded doubled between 1997 and 2014 in the 34 member countries of the Organisation for Economic Co-operation and Development, but there has been no matching increase in tenure-track positions. In fact, only about one-quarter of PhD students in the United States can reasonably expect to achieve such a position. Wilkins estimates that tens of thousands of people with PhDs in the United States do not pursue their scientific passions. Independent research offers them a way to continue their scientific work, even if only at night and weekends.

Some researchers take flight from academia immediately after — or even before — earning their PhD. Yet many stick around for a postdoctoral position, which usually yields a useful skill for independence: the ability to write grants and other funding proposals, notes Melody Sandells, a snow physicist based near Newcastle upon Tyne, UK, who is also a co-founder and the director of CORES. She decided to become an independent researcher so that she could spend more time with her children. Sandells now develops and evaluates computer simulations, usually as part of collaborative projects.

Others turn to freelancing after a long career in a more conventional setting. “It’s much easier to go independent if you already have a credible track record,” says Ian Lowe, an environmental scientist who splits his time between Adelaide and the Sunshine Coast in Australia. An increasing amount of managerial responsibilities, among other reasons, prompted him to take early retirement from Griffith University in Nathan, Queensland, in 1999. He collects a pension and still publishes and presents his research, reviews environmental studies and develops public policy.

**ACCESS TO FUNDING**

Cécile Ménard, a land-surface modeller, grew tired of travelling back and forth between her postdoctoral position in Finland and Edinburgh, UK, where her partner lived. In 2016, Ménard set up as an independent researcher in Edinburgh and joined Sandells as the second member of CORES. Her first contract was as a consultant for her former bosses in Finland, an opportunity that enabled her to be self-employed yet paid out of their grant. More recently, she and her collaborators started a project funded by the European Space Agency, and Ménard draws a salary from that award. Both Sandells and Ménard worry about their ability to access grant funds after the United Kingdom has disentangled itself from the European Union, as they expressed in a letter to *Nature* (see *Nature* 534, 475; 2016). Although independent researchers can apply to European funding programmes such as Horizon 2020, they are unable to get grant money from research councils in the United Kingdom without an institution — defined as a physical place for ten or more researchers — to back them up.

This is where the advantages of belonging to an organization such as the Ronin Institute and CORES become most apparent. “Simply giving people an affiliation and an e-mail address means that when they submit a paper to a journal or a conference, it will get read and their work will have a shot at surviving on its own merits,” says Wilkins. Through the Ronin Institute, scholars can apply for funding from US federal agencies such as the National Science Foundation, the National Institutes of Health and NASA, as well as private foundations. Wilkins also hosts weekly virtual ‘watercooler’ discussions for institute members and has organized in-person meet-ups. Thanks to the Ronin Institute’s network, members have even launched collaborations.

Although Sandells and Ménard are just getting started with CORES, they already use the affiliation in publications. They are...
the only members, at present, and Sandells plans to expand the group further. Ideally, she would like not only to manage grants and legal matters for members, but also to provide regular, stable salaries for independent researchers who may have fluctuations or gaps in their funding. Sandells is also reaching out to UK research councils in the hope that the rules can be relaxed to enable independent scientists to apply for grants.

TRIAL AND ERROR
Scientists do need not pursue science full-time to be part of virtual institutes. Many independent researchers prefer to divide their time between science and other interests.

Gene Bunin, a Ronin Institute member who investigates decision-making in mathematics and engineering, left the Swiss Federal Institute of Technology in Lausanne (EPFL) in Switzerland in 2013, just a few months before he was due to complete his PhD studies. Now living in Kashgar, China, he is pursuing research on the Uyghur language as well as his science. Since leaving academia, he has published several papers. “The reviews were quite merit-based,” Bunin says. “I had no real problem getting my work through to the journal and getting published.” Of course, those who do science as a hobby usually require a day job to pay the bills. Bunin makes ends meet with translation work. He lives in a hostel and works in the lobby or in cafés, and can get by on US$300 a month.

For some, the decision to do science on the side is less about personal preference and more about the reality of the job market. Ronin Institute member Vicenta Salvador Recatala from Valencia, Spain, trained in animal electrophysiology, then moved to studying plants. The switch made it hard to find a full-time position, she says. For now, she is working as a tutor and plans to continue her science as a hobby.

The freelance-science gig does not always work out, cautions Pawel Szczesny, a biologist at the University of Warsaw and the Institute of Biochemistry and Biophysics of the Polish Academy of Sciences. With his PhD research completed and only the dissertation left to write, in 2008, he moved to the town of Pajęczno for a change of pace and to pursue life as an independent researcher. Although busy with bioinformatics analysis for clients, Szczesny was frustrated by a lack of involvement in the design of experiments and found it hard to grow as a scientist without regular interactions with colleagues. In 2009, he decided to return to academic life, finishing his PhD and applying for the university job that he now holds. His current work includes a collaborative project on sudden infant death syndrome. “I have never been as happy with my research as I am now,” says Szczesny. Nonetheless, his solo experiment taught him a lot and he notes that his scientific confidence grew more quickly while he was working on his own.

STEPPING STONE
A brief stint as an independent researcher can be a valuable way station, says Ethan Perlstein, chief executive officer of Perlara, a biotechnology company that hopes to develop personalized therapeutics in South San Francisco, California. He used the time between the end of his postdoc and founding Perlara to manage a crowdfunding campaign and perform initial experiments in rented space. Scientists who want to transition to a new career might find a short period of working independently to be a useful midway position, he suggests.

To get started as a freelancer, networking is crucial. “I just told everybody I got self-employed,” says Floor Basten, a sociologist in Nijmegen, the Netherlands, who began to offer her academic services for a fee after 200 failed job applications. “They started looking at me like, ‘Hmm, maybe we can hire you.’”

And freelancers who are starting out should have some savings to fall back on or another source of income, because even successful solo scientists will find that their earnings come in waves. “It’s great when there’s work,” says Rose, who is also a member of the Ronin Institute. “But when there’s not, you sit around and worry.” Wilkins makes sure to keep funds to cover gaps so that he can live comfortably, if not extravagantly.

Although some may scoff at the idea of an independent scientist, there is no shame in being a freelancer, says Basten. “The world is very big and there’s lots of things to do,” she says. “I’m enjoying this a lot.”

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