career than being good at science. And although opportunities for paid positions in research have flourished in recent years, so has the competition. The message has yet to filter down to schools and university undergraduates, but professional science has become one of those careers that teachers and lecturers could euphemistically describe as 'popular' and 'competitive'.

This is good for science overall. The global talent pool is well-stocked and the number of proficiently trained apprentices eager to take their chances is healthy. It is less promising for the scientists themselves: too many are chasing too few positions.

In such a climate, providing careers advice for scientists has become a career in itself. Yet, as the researchers highlighted in the feature make clear, many of the questions and anxieties that trouble early-career scientists also crop up in other careers. And the useful skills that ambitious researchers are urged to develop are hardly unique to science either: confidence, communication skills, networking abilities and persistence will help to propel people up the ranks in most professional fields.

Not everyone is suited to a career in science — nor is there space for them. So how can the community identify and help those young researchers who have the best chances of success? Senior and established scientists can help through formal mechanisms such as mentoring schemes and more informal routes, including workshops and blogs. Universities and other institutions should recognize that these contributions are valuable, and assess and reward them appropriately.

Amid all this advice, how should young scientists judge which guidance to listen to? *Nature*'s advice to these young scientists is to read *Advice to a Young Scientist* by Peter Medawar (Harper and Row, 1979), which celebrates its 36th birthday this year. Back when it was published, digital science meant little more than measuring fingers, and to modern readers the book may look as if it belongs to another age, but almost all of its content remains startling relevant. Furthermore, it is warm, witty and written in a welcoming way that, at the very least, shows scientists that scientists can (a) communicate and (b) do so as well as anybody else.

Here is Medawar, for example, demolishing the platitude that science is based on mere curiosity. "Curiosity is a nursery word," he writes. "Most able scientists I know have something for which 'exploratory impulsion' is not too grand a description … A strong sense of unease and dissatisfaction always goes with lack of comprehension."

***"How can the community identify and help those young researchers who have the best chances of success?"***

But he is not always correct. On scientists who find that the job is not for them and opt out of research, Medawar claims that "the qualifications required of scientists are so specialized and time-consuming that they do not qualify him to take up any other occupation". In fact, as *Nature* has argued before, a solid grounding in science and the skills of research offer a strong platform for many alternative careers.

Lest anyone jump on the "him" in the above sentence and assume that this is a book 'of its time' that paints a male-dominated picture of science, Medawar is frequently at pains to stress the benefits of and the need for greater equality — for better and for worse. "Men or women who go to the extreme length of marrying scientists should be clearly aware beforehand, instead of learning the hard way, that their spouses are in the grip of a powerful obsession that is likely to take the first place in their lives."

And on the original point, on how young scientists can get ahead, he writes: "A novice must stick it out until he discovers whether the rewards and compensations of a scientific life are for him commensurate with the disappointments and the toil." Indeed. ■

# It's good to talk

*Help for those struggling to reproduce results could be just a phone call away.*

Survey results released last week by the American Society for Cell Biology (ASCB) included an interesting nugget. Some 72% of respondents said that they had been unable to replicate a published experimental result. Yet a higher proportion (77%) said that they had never been told that their work could not be replicated.

There could be many reasons for the difference. The most obvious would be that no one actually tried to replicate the research in question (or that they did not try very hard). When survey participants were asked how they responded to such problems, 55% said that they did not bother resolving the replication issue because they did not think the research was important enough to pursue. For others, the survey results suggest that if and when they did try to replicate, and failed, then they also failed to flag the problem with the original researchers. And it means that they did not ask the people who are best placed to help answer the most obvious question: what am I doing differently to you?

That is not always easy, but it should be the first response. And those on the receiving end of such enquiries should be open to them, not defensive or hostile. As this journal has pointed out before, there is often an art to science. The methods sections of papers, as rigorous as authors and journals try to make them, do not always tell the full story. They cannot pass on tacit knowledge — just as someone cannot be taught adequately from a book how to ride a bicycle.

More than 800 of the ASCB's 9,000 or so members answered the survey. They reported that the most common way to resolve problems with failed replication attempts was through collegial consultation with the lab that did the original experiments. In an era of huge competition in biomedicine — when some researchers might fear hostility or even retaliation from senior colleagues when questioning the reproducibility of their work — the survey shows that amicable collaborations, including reagent sharing and open communication, can improve science and make the work of scientists more efficient.

The 'replication crisis' in science, and in biological research in particular, is a serious and complex problem that will not be solved by better communication alone. This journal and others have launched initiatives that aim to address many suggested and suspected problems in reproducing results. The ASCB survey results again highlighted some of the issues: respondents rated the push to publish in high-profile journals and poor methodological training as the biggest factors.

The ASCB published a report alongside the survey results, which made some further recommendations for change (see go.nature.com/uh1wsu). These include improvements in statistics training and standardizing the way that experiments are performed.

Even if systemic problems are tackled successfully, some problems of irreproducibility will remain. Biological systems are complex and finicky, and there will always be new experiments, equipment and techniques that take time to master. That one scientist cannot repeat the work of a second does not mean that the first is unskilled or the second sloppy. Although much of the broader media attention on the replication crisis focuses on deliberate misrepresentation and research fraud, scientists and journals know that the reality is more complex, and less nefarious. Good science is often difficult science. And good scientists should not make it more difficult than it needs to be. So ask for help — pick up the phone. ■

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