needs technical improvements, such as better data-processing software and specimen delivery systems.

EXPERTS NEEDED

Ironically, the very diversification in skills now required to obtain an academic job has arguably turned many structural biologists into jacks of all trades, masters of none. Today's researchers are accustomed to sending crystals to synchrotrons for analysis, and computer programs perform the analytical work. "To solve a straightforward structure, you really don't have to understand the theory and the maths, and that's a bit of a pity," says Luger. "I'm a little worried that we're running out of people who know how to handle problems or complex situations."

Bosak notes that positions related to crystallography are frequently available at ESRF, and that they are hard to fill. "It's very difficult to find a good crystallographer these days," he says. Beamline scientists must have a thorough understanding of crystallography theory and instrumentation, skills that many modern training programmes do not emphasize. This means that a crystallographer with the right skill set can find that he or she is in demand.

There is also a growing list of contract companies that specialize in crystallography. Firms such as Proteros Biostructures in Planegg, Germany; Shanghai Medicilon in China; and Emerald Bio in Bedford, Massachusetts, provide full-service crystallography to clients, many of which are pharmaceutical companies. The firms employ scientists at bachelor's, master's and PhD levels to carry out all steps of crystallography, from protein design to structural analysis. But pharmaceutical companies such as Merck, based in Whitehouse Station, New Jersey, and Novartis, based in Basel, Switzerland, still have their own crystallography programmes centred on structure-based rational drug design, which also employ scientists at all levels. These companies are potentially a better fit for those who wish to focus on a specific protein or biological process rather than a plethora of them.

D'Arcy advises students with an interest in X-ray crystallography to take the time to learn its theoretical underpinnings and all the techniques involved. "Don't let people do things for you," she says. "There are a lot of senior people who know how to do things, and there's always a time crunch to get data — you get crystals, and you just want to see the structure. Taking the time to sit down and teach yourself the theory and computer programs is going to pay in the long run — because you really learn when things go wrong." ■

Laura Cassiday *is a freelance writer based in Hudson, Colorado.*

TURNING POINT
Nicholas Wright

As a student, Nicholas Wright pursued interests in biology and public policy, securing four degrees and a fellowship in the department of government at the London School of Economics (LSE). He now uses his neuroscience training and insights into human decision-making to inform nuclear-security policy as a fellow at the Carnegie Endowment for International Peace in Washington DC.

CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE

Did you always have dual interests?
Yes. I went straight to medical school at University College London (UCL), but I also did a year at Imperial College London studying health policy and management, which proved a turning point. While there, I did research in Chile on how best to incorporate scientific findings into clinical medicine. I learned that, to be effective, public policy must always take cultural and organizational factors into account; and I learned how best to ask questions so that they are relevant to public policy.

How did you combine your interests?
At the end of my medical degree, I went to a series of lectures by economist Richard Layard from the LSE, who talked about what neuroscience might be able to tell us about economic and social decision-making. I read up on neuroscience and decided to do a master's degree. My research into functional magnetic resonance imaging (fMRI) dispelled the hypothesis that only one area of the brain specializes in reading. The technique surpassed my expectations and proved itself to be a new source of information that could be relevant to public policy.

How did you delve into decision-making?
It wasn't by chance. After my postgraduate medical exams, I did a PhD project to study how risk perception influences decision-making, hoping to apply the concepts to issues of public policy. I worked with the Wellcome Trust Centre for Neuroimaging at UCL and stayed on as a fellow doing fMRI after I finished my PhD.

How did you position yourself for a policy job?
During a year-long fellowship at the LSE, I built up my contacts, planned events with policy-makers and created a narrative about my experience. Several policy-oriented job opportunities in Washington DC came up, but a position at the Carnegie Endowment for International Peace was most exciting.

What appealed to you about that post?
There was a lot of great work done in the 1970s on applying decision-making and cognitive psychology to nuclear strategy, but much less had been done recently. The ideas coming out of neuroeconomics hadn't yet been applied to international relations, so there was enormous potential for doing interesting work that could have a positive impact on the world.

Has your work had real-world impact?
In January, a colleague and I published an article called 'The neuroscience guide to negotiations with Iran' in *The Atlantic*. We combined insights from neuroscience, behaviour and history to better understand Iranian motives in the ongoing nuclear talks. For example, conciliatory gestures are more effective when they're unexpected. Neuroimaging experiments detail how the brain computes the difference between what is expected and what actually happens, and the more surprising the reward or punishment, the more impact it has on decision-making. Last year, Iranian President Hassan Rouhani unexpectedly used social media to engage on political issues, raising hopes for a diplomatic breakthrough. We argued that neuroscience provides a new, important source of evidence relevant to nuclear talks with Iran. Our article was read by US and UK defence policy-makers, and I have been asked to continue providing briefs to the US Department of Defense.

Do policy-makers value a science background?
In the world of public policy, there are so many competing priorities that there is a limit to how much science can be used. Winston Churchill once said that scientists "should be on tap, but not on top". Although science is not the only consideration, I am on tap to provide it. ■

INTERVIEW BY VIRGINIA GEWIN