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MODEL MENTORS

Mentors are often called the ‘unsung heroes’ of science. A good mentor guides graduate students and postdocs out of an experimental quagmire or helps them take the long view when a project seems doomed. But their contribution to the scientific effort is rarely recognized.

This year, *Nature* has honoured five such heroes — three in Britain in partnership with NESTA, the National Endowment for Science, Technology and the Arts, and two in Australasia. In Britain, the lifetime achievement award was shared by evolutionary geneticist Godfrey Hewitt of the University of East Anglia and immunologist Andrew McMichael of the University of Oxford. Steve Watson, a British Heart Foundation researcher based at Birmingham University Medical School, won the mid-career award. Out of a field of 74 nominees from across Australia and New Zealand, Tom Healy, a physical chemist from the University of Melbourne, was selected to receive the lifetime award. Rachel Webster, an astrophysicist from the University of Melbourne, won the mid-career award.

What makes a good mentor? All five winners were recommended by current and former protégés, who attribute much of their own success to their supervisors’

Five scientists nominated by their peers have created nurturing research environments and fostered fields and careers far beyond their labs. **Carina Dennis and Janet Wright** give credit where it’s long overdue.

guidance and encouragement. Scientific training was only part of it: these supervisors were prized for looking beyond short-term results, showing concern for individuals and helping them build sustainable collaborations beyond the mentors’ purview. Their involvement ranged from helping with a recalcitrant experiment to organizing international conferences.

What they do not do is important too. Several nominators spoke about supervisors they were glad to have avoided — people who pit lab members against each other by giving them competing projects, who get angry if data don’t support their own hypothesis, who are uninterested in their students, or who ignore any idea that they can’t claim as their own.

A helping hand

Julia James marvelled at her mentor’s hands-on approach. “In spite of his busy schedule, Professor McMichael donned a lab coat to assist me in growing a cell line,” says James, who is working on her DPhil. “His level of commitment and interest in my success is inspiring.”

Although he is hands-on when needed, McMichael also gives people space to develop their own ideas. “It’s often a matter of helping them decide if something

they've found is a breakthrough or an artefact that they shouldn't waste time on," he says. "It's where experience helps a lot."

McMichael learned this approach from his own mentors, including Hugh McDevitt at Stanford, and has passed it on. One of his former protégés, Charles Bangham, now professor of immunology at Imperial College London, says: "I try to mentor people as Andrew did, being ready to provide criticism when asked for it, being open to new ideas, not being prejudiced against an idea just because it doesn't fit with my current ideas or wishes."

Good mentoring can continue long after a student leaves the lab. "I've known Andrew since 1982 and I still ask his advice," says Bangham. One of McMichael's own mentors, Brigitte Askonas of Imperial College London, still helps students at his lab on regular visits, more than 30 years after she supervised his PhD.

Source of skills

Sometimes students and postdocs don't know when to seek advice — especially for skills beyond science. Watson tries to identify such needs and have those in his lab improve these skills. "Nearly everyone says they're a bad speaker, or can't write research papers, but these are skills that can be taught," he says. "Clearly not everybody is successful at all aspects of research, however, so this needs to be more carefully tailored."

Mentors need to know when and how much to intervene. "It's important to give students and postdocs the freedom to make their own mistakes and follow their own ideas, but only within reason," Watson says. Letting young scientists know they can turn to their adviser for help offers reassurance, and can motivate them to do better work. "For the individuals in the lab, it really does matter that they receive the support they need, as this is their only chance for this stage of their career," says Watson. "If each individual receives the appropriate level of support — including a sense of fun, objective advice and independence — the research will follow."

One of Watson's former protégés, Alastair Poole, notes that offering such support requires self-confidence. "I think Steve naturally realizes that supporting others through their careers doesn't threaten your own career, but rather the opposite," says Poole, now a reader in pharmacology at the University of Bristol. He adds that providing such support can elevate not just a lab, but an entire field: Watson's support for younger scientists has helped raise the profile of UK platelet and thrombosis research.

Hewitt encourages young scientists to build research teams among themselves. He starts by choosing people who personally click within his lab, then encourages



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— Godfrey Hewitt

them to build partnerships. "These days, with many skills impinging on a particular topic, you can work better, bounce ideas off each other, share the chores," he says.

Once the team is up and running, Hewitt provides them with a platform to shine. "I remember how Godfrey would drag the most senior scientists relevant to my research into the auditorium for my first talks at conferences, and then would nod encouragingly from the audience as I described my work," says Douda Bensasson, one of Hewitt's many former PhD students. Now a postdoc at the University of Manchester, Bensasson feels fortunate to have been advised to choose her graduate school for the supervisor she would have, rather than for a project or a place.

"There are some sharks around," says Hewitt. "But people who are very aggressive and personally ambitious miss the point: they don't influence others to do things, they don't have the combined effects of lots of people working together."

The team-building lesson has endured among his protégés. "Godfrey maintained that you can't expect to become an expert on everything, so it's important to build partnerships with people who can complement your own expertise," says Steve Cooper, now director of the Evolutionary Biology Unit at the South Australian Museum in Adelaide. He believes the collaborations he has built with people from different scientific fields have played an important role in his own research success.

Hewitt's team-building has repercussions long after his postdocs and students leave his lab. As students move on, they form an ever-growing network of contacts and expertise. And now that scientists he mentored have gone on to mentor their own students around the world, Hewitt takes an interest in the international careers of his 'academic grandchildren'.

Team effort

In Australia, Rachel Webster used a similar philosophy to create a strong research environment from scratch; there was very little astrophysics research at her institution when she was appointed just over ten years ago. Since then, she has fostered a thriving astrophysics community and spawned a significant pedigree of protégés, who attribute their success to her guidance.

Nominators emphasize Webster's wisdom in matching the individual with opportunities. "Webster sees the skills of each individual and then designs projects to suit these strengths," says Alicia Oshlack of the Walter and Eliza Hall Institute of Medical Research in Melbourne. She is commended not only for her continual attention to the career development of her protégés, but also for appreciating that not everyone will have the same career trajectory as hers.

A. GRIFFITHS

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— Steve Watson



A. E. BOCQUET



“She assumes you are a complex person who also happens to be a scientist, instead of a scientist who it so happens turns out to be a complex individual,” says Maurizio Toscano of the University of Melbourne. She also encourages a comprehensive outlook by emphasizing that even theoretical physicists need familiarity with concrete data.

“Webster argued that anyone planning on becoming a theorist ought to spend some time confronting the data,” says David Hogg of New York University, who was first mentored by Webster as an undergraduate in the early 1990s. “So she put me on a project designed to make a young and naive proto-theorist understand that real data are complicated, dirty and stubborn.” But the lesson was an inspiration rather than a deterrent — Hogg pursued more observational projects with large data sets and now runs a group dedicated to statistical astronomy.

Beyond the lab

Webster has also been a role model for women in physics. Ten years ago, she introduced the Women in Physics programme at the University of Melbourne; it has markedly bolstered the numbers of female graduates. “Webster was someone I felt I could relate to,” says Annette Ferguson. “Until that point, I had almost exclusively encountered middle-aged male professors during my physics studies and most of my fellow classmates were also male.” Ferguson, who first met Webster during her undergraduate years, is now a lecturer at the University of Edinburgh, UK.

Healy also helped build science beyond his own lab. “Tom Healy is an example of a person who not only mentors his own students, he also succeeds in mentoring an entire field of science,” says William Ducker of the University of Melbourne. Australian colloid and surface science is ranked among the best in



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L. O'Rourke (WEBSTER)

Rachel Webster and Tom Healy received their mentor awards at the Melbourne Planetarium (left).

the world, thanks in large part to Healy, Ducker says.

Healy brings people together from multiple fields to work on projects — whether or not they directly benefit his lab, says a former PhD student, Russell Crawford.

“He encourages research collaborations among scientists, even where he, or his university, would not be directly involved nor be beneficiaries of the research,” says Crawford, now dean of the faculty of life and social sciences at Swinburne University of Technology in Hawthorn, Victoria.

A meeting of minds

One of Healy’s most substantial legacies is a student conference on colloid and surface science. He and Bob Hunter of the University of Sydney established it nearly 40 years ago to help young researchers network with their peers. The conference has since been emulated around the world. “I can name many excellent Japanese scientists who benefited from research collaboration and personal association with the Healy academic family,” says Toyoki Kunitake of the University of Kitakyushu, Japan.

Healy fosters a nurturing environment and creates opportunities for his students, such as encouraging them to get overseas experience. An award bearing his name was established at the University of Melbourne to fund student travel to an overseas conference or research centre. He is also credited with bringing back to Australia some of the finest minds in the field.

He has guided people across academia, government laboratories and industry, extending his mentoring beyond traditional boundaries. “In today’s world, Tom’s interest and enthusiasm for forging strong collaborative links with industry might be seen as nothing unusual, but in the 1960s and 1970s it was ground-breaking,” says Brian Kavanagh, of the Water Corporation of Western Australia, who was mentored by Healy during his undergraduate studies and throughout his career.

Despite the hours they’ve spent on other people’s careers, none of these mentors feels they’ve missed out. This could be because they’re prodigiously hard-working: nominators noted the colossal energy they put into both research and mentoring. Awardees all agree that a harmonious atmosphere aids a lab’s productivity. And all have produced scientists who are following in their tracks by keeping good mentoring alive. In that regard, the songs of these ‘unsung heroes’ will reverberate long after they retire from research. ■

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