Vet’s journey to Royal Society fellowship

Author : Joel Dudley

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JOEL DUDLEY talks to Elizabeth Simpson, the latest of the profession’s members to join the illustrious institution, about her career and future hopes

AS a schoolgirl in the 1950s, Elizabeth Simpson was discouraged by teachers from becoming a vet, and was rejected from one veterinary school on the basis it had already filled its “quota” of one female student that year.

However, her determination won her a place at the University of Cambridge’s veterinary school and she ended up conducting research and teaching at the university and other prestigious institutions.

After completing her undergraduate studies in 1963, Elizabeth went with her geologist husband to Canada, where she worked in veterinary practice for two years before gaining research experience by joining a virology laboratory for a year.

She returned to Cambridge to pursue postgraduate training in veterinary pathology and to teach. She was subsequently recruited to research posts in Medical Research Council (MRC) institutes in London, and spent time working in the USA at the National Institutes of Health (NIH) and the Jackson Laboratory, ultimately becoming an internationally renowned expert in transplant medicine.

She is now professor emeritus of transplantation biology at Imperial College London’s faculty of medicine – and has just been made a Royal Society fellow.

Recalling being a teenager with aspirations of becoming a vet, and her subsequent experience of entering a male-dominated profession, Elizabeth says: “My experience of applying to vet schools in 1957 was a dire one. Women were a minor species and some, but not all, selection committees worked on a quota system – ‘one woman a year’ was used during my interview by one of them.

“I was not encouraged by my school to apply to study veterinary medicine; it was my father who helped me find out the requirements and ensure I could choose the right A-levels.

“Once at Cambridge, I experienced no anti-female discrimination from my fellow students or teachers. That was a huge, and to some extent unexpected, relief, and gave me confidence to deal with discrimination when I encountered it later in my career. The switch in sex ratio from predominantly male to female is, I think, a global phenomenon that has occurred during my lifetime. I hope it is not driven by notions of it being an easier-to-manage career option for women. Vets need to be adventurous and ambitious,” she adds.

Key figure

Following her postgraduate studies in pathology at Cambridge, Elizabeth moved first to the National Institute for Medical Research (NIMR) in London, where she worked with Nobel Prize-winning immunologist Peter Medawar, a key figure whose work on tolerance was a powerful influence in the development of organ and bone marrow transplantation.

Elizabeth had a daughter, Emma, in 1975 and brought her up single-handedly. Having successfully negotiated the twin pressures of parenthood and her career, Elizabeth insists there is no reason why women cannot have scientific careers and families – as long as they can keep up with the field and colleagues are understanding and supportive.

Reflecting on her own experience of juggling being a mother with research and teaching, Elizabeth says: “My daughter was born a couple of years after I set up my independent research group, so a small number of research fellows and technicians were already in place and, indeed, really exciting results were just beginning to come in. That continued over the years that followed.

“These were the most productive research years of my career, but I’m pretty sure I was not a negligent mother – the evenings, weekends and holidays we spent together were special times, and she also travelled widely with me on occasion to conferences in nice places, and when I went on sabbatical leave. In fact, Emma reckons she also benefitted from having as a role model a mother who took her work seriously, and enjoyed it,” she adds.

The experience of bringing up Emma while working gave Elizabeth an insight into the needs of young female colleagues within her research teams, who were also able to resume their work after having babies.

She explains: “There have also always been young women in my lab, both technicians and postdoctoral fellows, who have had babies while working with me, and have subsequently returned to the lab after a few months of maternity leave. I’ve always left it to them to decide how long they wish to stay on leave, bearing in mind that if they are career scientists the field is likely to have moved on without them if they leave it for more than five or six months.

“However, all of them turned out to be seriously involved in the research – not one dropped out – and all on their return were wonderfully well-organised. They worked super-efficiently during working time, which was constrained only by the need to get back home at certain times.”

She adds: “I was also aware of the problem of sleep deprivation in late pregnancy and with a wakeful baby. I sent wearylooking mothers home to rest as soon as they could finish any toppriority tasks – or find someone else to do them. One advantage of working in a research team is that sort of flexibility, but it is also about trusting all members of a team to not take advantage of each other for no good reason.”

Explaining why she made the move from a veterinary school to a human medical research establishment, Elizabeth says: “As a veterinary pathologist, I became interested in the nature of lymphocytic infiltrates I saw in Johne’s disease and TB lesions, as well as around the margins of tumours with good prognoses. It required laboratory experiments to find out more about their function, so that is why I went to the NIMR.

“When there, I contributed, along with the basic – as well as the medically qualified – scientists there, to an explosion of knowledge about lymphocyte subpopulations, each with different development pathways and functions. All of that work was conducted using experimental mice,” she explains.

Describing the vibrant community of researchers she worked within at the NIMR, Elizabeth says: “During my three years at the NIMR, I developed contacts with scientists in many other countries, including those working as PhD students or postdoctoral fellows, as well as more senior scientists on sabbatical leave or travelling through London on their way to conferences. The institute was a Mecca for immunologists in those days.

“Laboratory work was punctuated by meal and coffee breaks, during which discussions on our work continued, and went on into the evenings. Intellectually, it was very stimulating, if initially somewhat daunting to a neophyte like me. But I learned fast – mostly to ask questions. Questions are the beginning point of all research – you have to ask the right questions, and learn to judge what is of importance.”

Elizabeth does not believe it is useful to make rigid distinctions between veterinary science, medical science or other scientific disciplines, as they all contribute to the broad field of medicine. She is keen that other veterinary scientists become involved in research and would like to see

more collaboration between veterinary and other disciplines. To encourage this, she believes the veterinary schools should do more to encourage broader interests and experience.

Elizabeth says: “There is no boundary between human and veterinary medical research or, indeed, between medical research and research in basic science. Advances in basic science underlie those in medicine, and there’s only one medicine. Questions that need to be addressed by research are raised during curiosity-driven research, at least as often as those coming from observations and needs at the clinical level.

“Currently, there is not enough cross-disciplinary collaboration. Vets in training need to be exposed to career options in research and development, and encouraged to seek postgraduate training in a broader range of institutions, and not just the veterinary schools.

“There is a strong case for the veterinary schools to lead in this respect, encouraging both outflow and inflow of talent and cross-fertilisation between basic science and clinical science – human and veterinary. There are no real boundaries, and any perceived ones need to be broken down,” she says.

After three years at the NIMR, Elizabeth took a research fellow post in the USA at the NIH in Bethesda, Maryland, where she worked alongside leading immunologists. Her NIH experience gave her an opportunity to develop ideas she had been pondering regarding T-cell subpopulations and the control of immune responses, before bringing insights back to the UK.

Commenting on her trajectory from Cambridge to the NIMR to the NIH and then back to England, Elizabeth says: “Those radical moves, first from a veterinary enclave into a premier research institution, then from the UK to the USA, opened up my mind to ideas and gave me momentum. From the NIH, I was recruited back to the UK to head a small research team in another MRC institute – the Clinical Research Centre in Harrow – where I made sure to include basic scientists, as well as medical and veterinary graduates, among the PhD students.”

Outlining her work in Harrow, Elizabeth says: “I led my group to open up a new area of research into the control of immune responses to donor tissues expressing subtly ‘foreign’ molecules – the so-called ’minor’transplantation antigens, as proxy for tumour and autoantigens.

“I used mouse models to do this, although my results were applicable to humans and other mammalian species. I had the luxury of carrying out this work in a research institute where teaching responsibilities were not onerous. My MRC institute also had excellent core facilities and funding. This situation allowed rapid advances, incorporating new areas of genetics and molecular biology, enhanced by summer sabbatical leaves taken at the Jackson Laboratory in Maine and collaboration with scientists in other labs doing related research,” Elizabeth adds.

While at the MRC, Elizabeth was offered posts by two veterinary schools, but turned them down.

Explaining her reason for doing so, she says: “To have taken either at that time would have put my research seriously at risk, and that was too important for me to do. In addition to the facilities I enjoyed, I was also part of a vibrant community of basic and clinical scientists, and I was better placed there to make long-term gains in understanding fundamental biological processes applicable to the ‘one medicine’ that encompasses human and veterinary species.”

Over the course of her career, Elizabeth has frequently been involved in evaluating papers submitted for publication and grant applications. Her experience of reviewing applications for postgraduate research training, sitting on editorial boards of journals and on research funding committees has led her to conclude the scientific potential of vets is often going to waste.

She says: “At the moment, there is a significant wastage of veterinary talent with respect to research – and that needs to be addressed.

“I hope to contribute to this, by encouraging vets during their undergraduate years to retain their scientific curiosity and to seek training opportunities in the widest possible range of labs in universities and research institutions – at home and abroad, and perhaps after a period in practice – but also by keeping in contact with their veterinary school research deans, who can provide guidance on these matters,” Elizabeth concludes.