Research Policy

Wondering whether to join the brain drain

RICHARD SMITH

Steve Reeders, a medical graduate, has been in research for less than three years, and already he has played an important part in localising the gene for adult polycystic disease of the kidney.¹ When I spoke to him last summer he was being courted by Yale and swithering whether to leave Sir David Weatherall's unit in Oxford and go to the United States.

What attracted him about the United States were the facilities and the prospects and—more than anything—the excitement. The Americans are turned on by the prospect of applying basic science to “crack” polycystic kidney disease. Their response to what Dr Reeders calls a big idea is enormously enthusiastic; in Britain the same idea will often be dismissed as grandiose. When he went to visit Yale, they asked Dr Reeders “What would you need to make your research a success? Write it all down.” In Britain the attitude would be more: “Do you think that you might in these difficult circumstances be able to achieve anything?”

What's needed for research?

In response to the Americans' question Dr Reeders wrote down “space, meaning both physical and mental space, money to pay for staff and equipment, freedom from clinical commitments, and support from clinicians.” All of these can be difficult to find in Britain, although Dr Reeders was quick to point out that he had done well by the British system. The shortages of money and physical space in Britain are well known, and I interviewed Dr Reeders in a room about 12 feet by 12 feet that he shared with three others. They had minimal secretarial help.

Less clearly identified are the lack of time and mental space: when I spoke to him Dr Reeders spent 90% of his time doing research and only 10% doing clinical work. Such a ratio is hard for clinical researchers to achieve in Britain and is at best only temporary. Yet, Dr Reeders and others believe, few researchers can hope to be internationally competitive unless they have such time and space.

Yale can offer space because it has so many more staff than Oxford. The two cities are of a similar size, and yet in Yale there are 15 nephrologists and three new fellows start each year, whereas Oxford has two consultants and one new research fellow a year on average; then Yale has 24 whole time appointments in genetics with 12 joint appointments, whereas Oxford has five full time and one part time human geneticists.

Indifference to research among British doctors

This difference in staffing may explain the difference in attitude to research among ordinary doctors. Those in Yale are interested in discussing growth points in research, while those in Britain are mostly too busy to maintain such an interest. Dr Reeders also

detected a difference in young doctors. Oxford, he said, has “spectacularly bright” house staff and yet few are considering careers in research. They see no prospects in academic medicine and few even in medicine in the larger hospitals. They are looking for bolt holes into general practice, radiology, anaesthetics, anything where their future will be more secure.

Some medical students Dr Reeders knew were even thinking of going into merchant banking. “I can understand that,” he said. “The City is exciting. The work there may be nothing very worth while, but it's exciting. And it's not just the money. In contrast, teaching hospital medicine in Britain is not looking to the future.” In Yale, however, he met medical students and young doctors who were brewing up research projects while they walked the wards. “I've been reading up on renal organogenesis, and I've got an idea. . . .”

Sir David Weatherall, when I talked to him, went further in expressing his alarm at the lack of enthusiasm among doctors for high quality research. He finds that many doctors and even medical students are hostile to molecular biology. This might, he thought, be because it seems so reductionist at a time when the fashion is to be more “holistic.” But this is to fail to grasp the possibilities of understanding and treatment that molecular biology will open up. Furthermore, most of the treatment possibilities will not depend on large and expensive machines.

But, more seriously, Sir David is worried that ordinary doctors do not value doctors who are internationally competitive researchers. In order to achieve such high standards those doctors need to devote most of their time to research. This means that their clinical skills will inevitably be less sharp than those of doctors who work clinically all the time. It also means that those who spend most of the time in the laboratory might be seen as not pulling their weight at a time when the load on everybody is heavy.

Shortage of funds might in this way lead to the cultural attitudes that Dr Reeders saw as indifferent if not actually hostile to research, and I asked him whether he thought the different attitudes in the United States were the result of culture or economics. He thought that the two were probably inseparable: the Americans have long been wealthy, and “big ambitions” can be realistically fulfilled, whereas British research institutions not only have fewer staff, who thus have less time to wonder about molecular biology, but also less facilities and funds and so less chance of “cracking” polycystic kidney disease or any other disease. What's more, it would be very “unBritish” to tell the world that you were setting out to beat a disease (even if you were).

Easy come but quickly go in the United States

I asked Dr Reeders whether he thought that the offers made to him at Yale, which included starting a whole new unit for renal genetics, together with the ideas of “beating diseases” might be “just talk.” He thought not, but he did recognise that if you didn't come up with the goods in the United States you would be chucked out.

Dr Reeders thought that one side effect of the large funds

available for research in the United States was that "funding went down to a level where mediocrity is commoner." He was sure that Britain gets better value than the United States for the money it spends on research, but he also recognised the difficulties of selecting researchers and projects that would be productive and thought therefore that it was better to be able "to splash money around."

Dr Reeders had other positive feelings for Britain, and particularly for the Nuffield department of medicine in which he worked. He thought that the overall standard of science was at least as high in his department in Oxford as in the department he might join in Yale, and he had "good collaborations" in Oxford and a loyalty to the department and Sir David. Furthermore, a move would mean lost time, and nobody wants to lose time when they are at the frontiers of research. In its way it's as competitive as international athletics.

Salary and prospects

One factor that was not all that important to Dr Reeders was his salary. Here he earns £18 000, whereas in the United States he

would earn \$55 000. But as the cost of living is higher there he thought that that salary would work out to be about £25 000, which he thought he would probably be earning soon anyway if he stayed in Britain. He also observed that the salaries offered by American colleges were inversely related to their status: the best pay the least, recognising that people don't go to Harvard or Yale for the bucks.

Prospects did, however, matter to Dr Reeders, and when he stepped outside Oxford he was horrified by what he saw. He visited teaching hospitals that were "research deserts"; walked through laboratories that were like "empty barns"; and visited internationally renowned departments where morale had been destroyed. He could spend all his life in Oxford, but where could he go? America. And he did.

The next article will consider the training and conditions of medical researchers, and the one after the brain drain.

Reference

- 1 Reeders ST, Browning MH, Davies KE, *et al.* A highly polymorphic DNA marker linked to adult polycystic kidney disease in carcinoma. *Nature* 1985;317:542-4.

New Drugs

Adverse drug interactions

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Adverse interactions of drugs represent a great "growth industry" in medical publishing. Only a small proportion of reported problems have predictable clinical repercussions but these still represent more than can be readily kept in mind. In addition, new interactions are constantly being uncovered. An appreciation of the risky drugs, the vulnerable patients, and the pharmacological mechanisms occurring will allow safe navigation through the maze of effective prescribing with avoidance of iatrogenic disasters. Some knowledge of the clinical pharmacology of the drugs commonly used is essential. Such information is now readily accessible to all and will be considered later in this series.

Harmful combinations

The prime concern of the prescriber is to treat disease and improve the quality and quantity of life. The past 20 years have witnessed a substantial boom in the development of powerful pharmacological agents that have the potential for harm as well as

benefit. In many instances drug combinations will enhance efficacy or limit toxicity. Particular concern has, however, emerged regarding the problem of adverse interactions where the concerted effects of two therapeutic agents are unintentionally greater or less than the sum of their individual actions. The increasing use of drugs in an aging population who have various degenerative disorders demands a good understanding of pharmacological properties. It is now possible to anticipate many adverse interactions of drugs and to recognise others early before the patient suffers from serious toxicity.

Many drugs have been shown to interact in anecdotal case reports and in studies in healthy volunteers. The variability of response among patients will fortunately ensure that only a handful result in important adverse effects. As no one can be completely familiar with all such eventualities some selective approach must be used to ensure that major interactions are avoided without precluding the safe and beneficial use of drug combinations. This can be made easier by appreciating the type of drug most likely to cause problems and identifying those patients at greatest risk.

Risky drugs

Many of the most effective drugs in clinical practice have a narrow therapeutic ratio. These often affect a vital process such as blood pressure, respiration, or coagulation and have a steep dose-response curve, which ensures that an increase in dose is associated with a similar increment in effect. Others, depending on concentration, produce great toxic effects that may be life threatening—for example, aminoglycosides, digoxin, lithium, and methotrexate. For

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