

to 42 now. Postdocs, facing such a late start to their professional lives, are increasingly jumping ship to industry.

Academic institutions rely heavily on graduate students and postdocs to bring in tuition or overhead funding and to carry their share of the teaching load. The motivation for principal investigators is even stronger. Students and postdocs carry out the day-to-day work in laboratories serving as cheap, well trained labour. Moreover the nature of discovery often seems to require big numbers: far better to have six postdocs working on several projects, in case one of them gets results that will ensure funding for the laboratory for years.

This pattern has, of course, been familiar for years — and not just in the United States. Postdocs find themselves bouncing around the world from lab to lab, seldom earning much more than they would have done in their first year on the job market with their undergraduate degree. Funding is short, the hours are long, and prospects uncertain.

Postdocs have occasionally attempted to band together in solidarity and seek a better settlement from their employers, the institutions and universities. But this movement has been stronger in the social sciences than in the hard sciences. The transient nature of the

work, together with its convoluted employment structure, has made it difficult for them to speak effectively with a single voice. Instead, the plight of the postdoc will probably change only if the issue of scientific training is addressed from the top, where it may be necessary to consider the possibility that too many scientists are being trained.

There is an argument that, from a national policy perspective, the current situation is ultimately productive. The pace of discovery is quickened by a sizeable workforce, and able scientists end up doing multiple jobs, most of them in the private sector of the economy. It might not be exactly what the students had in mind in the first place, but the situation hardly constitutes a major cause for concern.

But FASEB's data suggest that too many graduate schools may be preparing too many students, so that too few young scientists have a real prospect of making a career in academic science. More effort is needed to ensure that recruitment interviews include realistic assessments of prospective students' expectations and potential in the academic workplace. And training should address broader career options from day one rather than focusing unrealistically on jobs that don't exist. ■

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Technology trap

California is right to sound a cautionary note on electronic voting.

Designing an electronic voting system that is easy to use, efficient and secure may sound like an easy thing to do. And the pay-off — a democracy in which more people can participate and trust — seems desirable. But an academic analysis of three widely used systems in California has found monumental weaknesses in each of them. As a result, the state is slowing down its adoption of such systems until significant improvements are made. Others should exercise similar caution.

The study, commissioned by California's secretary of state, Debra Bowen, was led by computer scientists at the Berkeley and Davis campuses of the University of California. It found that the systems sold by three companies — Sequoia Voting Systems, Hart InterCivic and Diebold — had not been designed with security requirements in mind. And one particular deficit alarmed representatives of all political parties: the possibility that computer viruses could distort vote counts.

On 3 August, Bowen decertified the systems, which were already in use in counties where about half of the state's voters live. That means that in the primary elections next February, voters will return to paper ballots. Bowen has pledged to fully recertify the machines when they comply with a list of basic requirements: but the study authors question whether the software and hardware are amenable to ready repair. "They have serious security problems that will take years to fix," says David Wagner, a study leader at the University of California, Berkeley.

This isn't the first time that specialists have warned against electronic voting systems. The Voting Technology Project, for example, a joint effort between the Massachusetts and California Institutes

of Technology, highlighted their failings back in 2001 (see *Nature* 412, 258; 2001).

Yet the march of voting automation continues worldwide, often driven not by the public good but by election officials' desire for low staff costs and quick counts — as well as by the marketing machines of the systems' suppliers. Even in the United States, the Californian analysis is unlikely to make much of a difference in the many other states where the same electronic systems are being introduced. Verifiedvoting.org, a non-partisan lobby group that campaigns for reliable voting, says that although some secretaries of state are paying attention to the study, others — especially in the south and the midwest — don't seem to be interested.

There remains a body of public officials who seem to favour expediency and convenience over the democratic imperative of an accurate count. The firms that sell the systems have, meanwhile, argued that in the real world of elections, the systems will be overseen by election officials and candidates who would protect against the kind of disruptions identified in laboratory studies.

After the scandal that unfolded in Florida in the 2000 presidential election, when President George W. Bush eked out a narrow victory after prolonged legal arguments over disputed ballots in several counties, Congress passed a law that, among other things, helps to fund the replacement of existing, outmoded voting equipment. Now it is set to revisit the issue, with Senator Dianne Feinstein (Democrat, California) pledging to hold hearings that will pick up where the review in her own state left off. This may spur broader federal action to strengthen voting systems.

The consistent message from studies of electronic voting systems has been that the technology is often being implemented before it is ready to achieve the levels of security and reliability that voters are entitled to expect. Other jurisdictions worldwide should follow California's lead, consult with computer scientists, and act where necessary to stop this from happening. ■