Tough lessons for survival in hard academic times

Should young scientists still follow their hearts or do they have to follow the money?

Sir — Steven Weinberg's Concepts essay "Four golden lessons" (*Nature* **426,** 389; 2003) is full of idealism, based on his experience, garnered "about a hundred years ago". Sadly, the research and economic worlds have changed dramatically during the past quarter-century. I suggest that Weinberg's rules should be revised for modern would-be postgrads.

One: look at the career structure in scientific research — it is virtually non-existent. Research careers are usually tied to teaching, so if you want to forge a future in research then you will need to secure academic tenure. If you are still dependent for your salary on 'soft' money — research grants — by the age of 35, you will then be told by (much older) tenured colleagues that you are "too old" for research and that you should look for another career. So see your early steps into the research world as leading towards a completely different career. Banking, finance or teaching are common end-points. Academic administration may provide a means for revenge against those professors who misled you about your future.

Two: take note of which areas of research in your chosen discipline have the oldest entrenched academics, and head for those. Many were filled in the 1970s by baby-boomers who are now approaching retirement, so you may be well-positioned for one of their jobs.

Three: look at the best jobs outside academia. For example, a well-known scientific journal advertised a research position last year in a British astrophysics department. Conditions included a poor salary of less than £20,000 (US$35,000) a year, and limited tenure for 12 months "with the possibility of renewal for a further 12 months". The position required a maths/physics postgraduate with extensive experience in database management. On the following page was an advertisement from a London merchant bank. This asked for identical qualifications, but promised a starting salary of £48,000 "with rapid advancement" and a well-structured career pathway. So there are good career opportunities for postgrads. They just don't happen to be in academia.

Four: look at the new fields emerging for employment in big, profitable industries. For example, the pharmaceutical industry employs many graduates, in lab research, database and analysis, clinical trials and marketing. Annual reports will reveal what fields companies are moving into, and what they are dropping. 'Pharmacogenomics' and 'proteomics' are examples of trendy new fields that are attracting large budgets, whereas animal testing is gradually being wound down in favour of *in vitro* cell modelling and large-scale, mathematically based analysis such as cladistics.

Choose your research path according to hard-headed economics, and forget the good old days when students went into research because it was fun. You know that things are different now.

John A. Duley
Mater Misericordiae Hospital, Raymond Terrace, South Brisbane, Queensland 4101, Australia

White House cost-cutting undermines productivity

Sir — Having read the News story "Democrats condemn government 'meddling' with NIH" (*Nature* **425,** 888; 2003), I was overcome by disgust for the blatant disregard the White House shows towards education and research. I find it difficult to understand the logic behind privatizing a historically government-run agency. It is true that you could argue that the National Institutes of Health should be run more efficiently, but you could argue that the White House should be run more efficiently too. Education and scientific advancement are the backbone of any great nation. Applying pressure and weakening morale in these areas will only lead to declined productivity, and a weaker United States of America.

A News in Brief story in the same issue, "Foreign students to foot the bill for US security scheme" (*Nature* **425,** 892; 2003) describes the White House plan for 'taxing' foreign-student visas as a way to raise capital for homeland security. I work in a research institution that employs a large number of foreign research associates whose work advances medicine and science, often with the goal of saving lives. I have seen accomplished foreign scientists encounter situations in which immigration has made employment in the United States such a headache that they chose to take their skills to a different country.

At what point will the decision-makers in Washington realize that their 'initiatives' cause more grief than good?

Matthew C. Salanga
Division of Neuroscience, Children's Hospital, 320 Longwood Avenue, Boston, Massachusetts 02115, USA

Joint efforts needed to forecast space weather

Sir — In response to your News story "Bleak forecast for space weather" (*Nature* **425,** 649; 2003) about US funding and organizational issues, we would like to suggest possible European and global collaboration in this field.

Scientists in the United States and Europe now believe that computer-based forecasting of space weather is possible in real time, from hours to possibly a few days ahead. Such forecasts would provide estimates of the effects of solar flares and solar particle fluxes on Earth's magnetic field. Computer and data-handling systems would be similar to those used for numerical weather prediction but would instead use the equations of magneto-hydrodynamics and plasma physics and rely on real-time satellite (for example, SOHO, CLUSTER, GEOS, ACE, RHESSI, TRACE, WIND, POLAR and GEOTAIL) and ground-based observations.

Regional forecasting centres would be needed to operate these systems. We proposed one such centre — the European Centre for Medium Range Weather Forecasting — at a recent Royal Society meeting (J. C. R. Hunt and A. J. Coates *Phil. Trans R. Soc. A* **361,** 205–218; 2003), and another was proposed as a possible role for the National Center for Atmospheric Research in the United States, following a review of the centre chaired by James Baker in November 2001.

Recent events such as the unusual solar activity seen during the past few months (*Nature* **426,** 112; 2003) have shown that quantitative predictions are needed for how solar activity affects systems on Earth, including air-traffic control and electrical power grids. Just as plans are developing to organize global warnings of near-Earth objects in space, surely there are equally good reasons to establish a global cooperative network for forecasting space weather, involving major centres in North America, Europe and Asia?

Julian Hunt, Andrew Coates
Department of Space and Climate Physics, University College London, Gower Street, London WC1E 6BT, UK

correspondence

Contributions to Correspondence may be submitted to **corres@nature.com**. They should be no longer than 500 words, and ideally shorter.