"A playboy mathematician with yarns about ice and reindeer was the toast of the town." D. Graham Burnett, page 943

all but opaque to the lay public (and to some members of our own profession), which alienates their interest in our investigations.

But our research is more relevant for them if it can be measured by its economic return. It would be hard to argue that the pressure to publish is somehow better or more meaningful than the pressure to recoup economic returns. Done properly, research assessment based on a balance between publications and economic output may be a way out of the impact-factor game.

Herman Tse Department of Microbiology, The University of Hong Kong, Pokfulam, Hong Kong
e-mail: htse@hkucc.hku.hk

The human face of a difficult, heroic, passionate scientist

SIR — In his Book Review 'Making genetic history' (*Nature* **453,** 1181–1182; 2008) of James Schwartz's *In Pursuit of the Gene*, Jerry Coyne claims that the US geneticist Hermann Joseph Muller was "the perennial underdog: Jewish, short, bald and with a high voice". Bald and short he was, but his voice was more baritone than tenor. As for his Jewishness, Coyne is perpetuating a myth: Muller's father converted from Catholicism to become a Unitarian because of his liberal social and scientific views; his mother's side was of English ancestry, mixed Jewish and Anglican. Muller was raised Unitarian, became an atheist and took an interest later in his life in humanism.

Coyne casts me in the Iago role for poisoning the outlook of Schwartz about Muller through my "worshipful" biography. I pointed out Muller's insecurity, his suicide attempt, his difficult confrontational personality, his naïve embrace of Soviet communism, his almost ideological passion for positive eugenics and the reasons for his so-called 'priority complex'.

But I also admired Muller for his courage in the way he took on failed competing theories of the gene, and for his passion for what he believed to be scientific truth. How many scientists would have engaged in a public debate with Trofim Lysenko, calling him a charlatan, in the year of Stalin's purge trials?

I wish that all science was done in a friendly, cooperative and respectful manner. In the fly lab Muller shared with Thomas Hunt Morgan and his 'boys', this was not so. Any reading of the correspondence in many archives will reveal the discontent, rivalry and hard feelings that accompanied a genuine enthusiasm to share ideas. Science is very human. Both Schwartz and I tried to present it that way.

Elof Axel Carlson Department of Biochemistry and Cell Biology, Stony Brook University, Stony Brook, New York 11794-5215, USA
e-mail: ecarlson31@netzero.com

Micromanaging ideas risks impeding flow of potential benefits

SIR — In his Correspondence 'Translational research: don't neglect basic science' (*Nature* **454,** 274; 2008), Stephen Moss is concerned that fundamental research will wither at the expense of translational science. But it's the proponents of translational research who should be more worried about reductions in the funding of discovery science, because this is the wellspring from which all science's societal benefit flows.

The problem is that discoveries are hard to plan for and not obviously applicable before they happen. This inherent inefficiency must nevertheless be underpinned by substantial investment, much like miners sorting tons of earth to find a gemstone. Some might argue that we already know enough and should now put what we do understand into practice. But that approach can have an enormous attrition rate — look at drug development.

Astute science policy-makers need to realize that monikers such as 'basic', 'translational' and 'clinical' applied to medical research are all part of a continuous spectrum that many researchers can successfully travel in both directions if necessary. The risk is that in our efforts to accelerate a useful outcome through top-down interventions and incentives, we may deplete the flow of quality discoveries for development and end up refining rubbish. The scientific process has served society well, generating enormous advances over the past 500 years.

It's simple: recognize and promote excellence in basic research, balance volume of discovery with selective development and throw in a dash of patience. This system isn't broken and doesn't need fixing. We are doing humanity a disservice by trying to micromanage inspiration.

Jim Woodgett Samuel Lunenfeld Research Institute, Joseph and Wolf Lebovic Health Complex, Mount Sinai Hospital, 600 University Avenue, Toronto, Ontario M5G 1X5, Canada
e-mail: woodgett@lunenfeld.ca

Open debate could slow flu vaccine production

SIR — In his Commentary 'The contents of the syringe' (*Nature* **454**, 160–161; 2008), Steven Salzberg is highly critical of the World Health Organization (WHO) process for selecting influenza strains to include in vaccines for the coming year. He suggests that predictions could be improved by using sophisticated informatic modelling techniques to interrogate the available sequence and antigenicity data. However, the WHO's expert group responsible for strain selection is now deploying these routinely and its track record has generally been good.

Salzberg argues that the expert group's recommendations should then be opened up for external critique. This is impractical. Strain selection is carried out under huge time pressure, with manufacturers having just six months to deliver tens of millions of vaccine doses. Delays can have very serious economic and political consequences for vaccine producers and health authorities. Decisions are left until as late as possible, usually mid-February for Northern Hemisphere countries, in order to have the widest data set to inform the decision.

Unfortunately, epidemics are sometimes only just beginning at that time. As providers of reagents to standardize vaccine potency, we are acutely aware of pressures inherent in the system, with days making a difference to the delivery of vaccine on schedule. To allow time for critical input, the strain-selection process would need to be brought forward, which would defeat the object by reducing the amount of hard data available to inform the decision.

Salzberg believes that using cell culture, rather than eggs, for production could speed up vaccine production, thus allowing more time for strain selection. The effect, if any, would be small because the time to delivery of final vaccine lots depends primarily on a whole series of quality-control, formulation, filling and packaging steps that are essentially the same whatever the production system.

We must still, therefore, rely on an imperfect process in which a group of experts makes the choice quickly, and as best it can. No doubt there is scope for further improvement, but an open debate before each decision is made would be counter-productive.

Stephen Inglis, John Wood, Philip Minor National Institute for Biological Standards and Control, South Mimms, Potters Bar, Hertfordshire EN6 3QG, UK
e-mail: singlis@nibsc.ac.uk