

**"It makes no sense to redefine as heart-warmingly resilient a society in which everyone ends up dead." Jared Diamond, page 881**

scientific credentials of the new batch of Honourable Members might therefore be instructive.

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## Outcry stopped approved pig study of avalanche survival

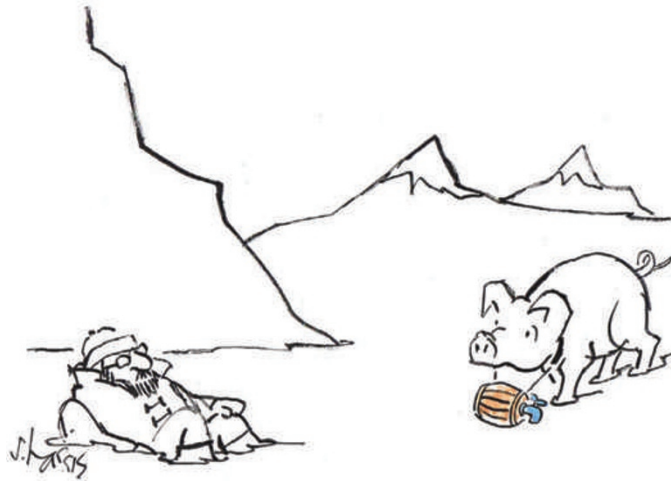
Animal testing is unavoidable for scientific progress, but mainland Europe has no equivalent to the UK group Pro-Test to speak out for it. Our negative experience demands that scientists and politicians rectify this deficit in public information.

We set out to study the factors that determine survival after avalanche burial, with a view to improving rescue and reducing mortality. The interactions, after snow burial, of hypoxia (oxygen deficiency), hypercapnia (an excess of carbon dioxide in the blood) and hypothermia are poorly understood. But, under the Helsinki Declaration, such investigations are permissible only in animals.

Our study, which involved monitoring 29 anaesthetized pigs buried in snow at altitudes of 1,900 metres, was formally approved by the Austrian federal ministry of science and research and supervised on site by a representative. It was undertaken with scrupulous attention to Directive 86/609/EEC of the European Council.

However, we were forced to abandon the experiments because of a concerted outburst by animal-rights organizations and the sensationalist press, aggravated by television, radio and a few politicians (see [go.nature.com/lbYzuO](http://go.nature.com/lbYzuO)). There followed an 'avalanche' of misrepresentations, false accusations, even bomb and death threats.

How could flawed reporting of our experiments make front-page headlines for four days during the Haiti catastrophe? Is the loss



of some 200,000 human lives in Haiti less important than the alleged suffering of anaesthetized pigs on people's doorstep?

Most fellow scientists and the relevant government ministries remained silent during this totally unexpected, hostile campaign, failing to support our attempts to correct misinformation and justify our investigation.

The enormous gap in public awareness of the scientific benefits of strictly regulated animal research fosters such misconceptions and encourages manipulation. Schools and universities can help to correct this by conveying the value of well presented, unbiased, evidence-based information from ethically evaluated animal experimentation to the widest audience.

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## University overhaul vital to end Bulgarian science's long decline

The reforms under way in Bulgaria's research and higher education (*Nature* **463**, 283;

2010) are not enough. A full-scale external evaluation of the entire university system is also needed.

Among Bulgaria's newly established universities, there is not one department of mathematics, physics, chemistry, biology or engineering. Even the technical universities do not offer majors in natural sciences.

This situation has come about partly because of shortsighted decisions taken in the early 1990s, when the government closed all its research and development (R&D) institutions. No new institutions were created, and the traditional links were severed between the research sector and the industrial sector.

Public awareness of science and technology plummeted as a result. The standard of high-school teaching in mathematics and science fell from well above to below the world average. With no new blood coming in, the Bulgarian Academy of Sciences shrank by more than 50%.

Bulgaria is at the bottom of the European Union (EU) for the number of scientists and technology companies per capita, and for R&D funding as a percentage of gross domestic product. It is the only new EU member that did not negotiate direct funding for science and scientific infrastructure from EU accession funds.

We are halfway towards picking ourselves up. Last year,

a commission of the European Science Foundation and All European Academies came up with invaluable guidelines for the restructuring and development of all research units in the Bulgarian Academy of Sciences. The effects will be minimal unless there is a similar evaluation of the country's university system.

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## China fights fraud with tough tactics and integrity training

Scientific fraud is indeed rampant in China (*Nature* **463**, 142-143; 2010). Sanctions against guilty individuals can help in countries everywhere, but these aren't enough in the longer term to correct a dangerous misperception of misconduct among China's scientific community.

As editor-in-chief of *Naunyn-Schmiedeberg's Archives of Pharmacology*, I recently came across a case in which a Chinese scientist had simultaneously submitted essentially the same data set to three journals. All three papers were eventually published, although later withdrawn by the respective journals.

When alerted to this incident, the corresponding university reacted swiftly by firing the author who was apparently primarily responsible. It also initiated an important new policy to train all new postdocs and junior faculty in the principles of research integrity.

Such structural measures could prove to be a valuable addition to the armamentarium of fraud prevention and should be part of scientific training in every academic institution.

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