Preserving embryos

SIR — The question of human embryo cryopreservation is being discussed again in the scientific journals[1,2] as well as in quality newspapers[3]. The discussion arose from a paper by Dulioust *et al.*[4] that claimed that in a long-term study comparing the development of cryopreserved and control embryos of mice, the researcher observed "significant differences" in morphological and behavioural features. They also advised researchers to make "a more limited use of this [cryopreservation] technique in clinical practice until clear conclusions about its effects on human embryos can be drawn". This led to comments in the French Parliament and the British House of Commons[5] and caused some concern among researchers. The authors of the study have, however, issued a statement to the effect that their "significant results" are similar to those usually observed between two different lines of mice. In short "the significant results" have no significance.

The question of the effect of cryopreservation on human children naturally concerns us. Fortunately, there is no society, civilized or otherwise, that would allow a statistically designed experiment to be carried out in this area. No firm conclusions can, therefore, be reached about the effect of cryopreservation of embryos or sperm. This does not, however, mean that no "working" conclusions can be drawn about the development of children born by medically assisted procreation (PAM). In this situation there is a well-trodden tradition of using observational studies. We can design such studies to compare the development of some abilities in PAM children with a matched group of other children. Indeed, with other French researchers[6], I carried out such research in France. Its aim was to see if the development of some behavioural traits differs in PAM and other children and to carry out appropriate genetic analyses. We collected data on 103 children born by artificial insemination by donors (frozen sperm) and on a matched sample of 103 children. Regrettably, the analysis of the data has been delayed and I shall report the results as soon as preliminary analyses have been made. I can, however, say that I noticed no material effects.

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1. *Science* **267**, 618–619 (1995).
2. *Nature* **373**, 553 (1995).
3. *Le Monde* 18 January 1995.
4. Dulioust, E. *et al. Proc. natn. Acad. Sci. U.S.A.* **92**, 589–593 (1995).
5. *Hansard* Cols 905–908, 14 February 1995.
6. *Nature* **362**, 102 (1993).

Greenhouse gases

SIR — There are no free lunches; nuclear power is as clear an example of that as the greenhouse gases resulting from fossil fuel combustion. Nuclear power carries with it the myth of limitless 'clean energy'. In order to judge the value of a procedure, the history of the practice and results of its use must be considered. That of nuclear power is fraught with errors and misuses, not the least of which are the production of nuclear weapons and accidents such as that near Chernobyl. One possible approach to replacing fossil fuel combustion is "making nuclear power usable again" (*Nature* **375** 91; 1995). There are many other ways of generating power and, more importantly, of reducing the amounts we use now.

Very few methods of generating electricity result in zero harm to ourselves and other natural systems. Hydroelectric dams kill anadramous fish and the making of solar energy panels requires the use of toxic chemicals. Nuclear power results in very dangerous waste products in liquid and solid form. Governments and private companies involved in developing this power-generating technique have a history of deceiving communities near the power plants, sources of uranium and sites of waste disposal. There is no reason to think that if the scale of nuclear power were to dramatically increase, these agencies would suddenly act in a more responsible manner; the converse is probably closer to the truth.

The solution to greenhouse gas production certainly lies in reducing reliance on the sources of this global pollutant. However, if the first alternative advocated is the re-adoption of nuclear power, despite its tattered history, then the scientific and technological communities will have certainly renounced their responsibility to act ethically. Reduction of rates of consumption and production are at the heart of a rational and sustainable way of living in our finite world. Even if this means a change in our standard of living, or the amount of high-tech science we can do, we must embrace it nonetheless, rather than grasping at the nearest available replacement to petroleum regardless of consequence.

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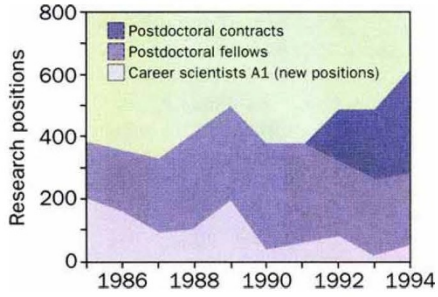
Spanish science

SIR — Human capital investment in Spain is an explicit priority in science policy, since the number of scientists and engineers in research and development is far from European Union standards. However, in spite of the Spanish public efforts in the training of young scientists (see *Nature* **360**, 502; 1992), little has been achieved in offering them stable positions. From 1990 on, the central and regional administrations have invested more than US$500 million in support of a yearly average of 8,000 graduate and 2,000 postdoctoral fellowships.

As the number of postdoctoral trainees has increased in both quantity and quality, the continuous shrinkage in research jobs has frustrated the expectations of the young scientists. To cope provisionally with this widening gap, the government decided in 1992 to provide three-year contracts to young scientists. but the problem has now worsened. Take, for instance, the case of the Spanish scientific research council (CSIC), the leading Spanish research institution in which one-third of those researchers at present work: an



Job opportunities for young scientists in the Spanish scientific research council (CSIC). Data from CSIC's annual reports.

increasing number (nearly 600) of total postdoctoral fellowships and contracts is faced with a frozen number of new staff positions (an average of 45 annually in the past three years). Besides this, very few of these scientists have a real option to enter academic positions because of the secular endogamy in the universities. On the other hand, the few job opportunities in industry are in general adapted to less qualified candidates.

The general dissatisfaction with this situation is demonstrated in an open letter to the heads of the Spanish state and government, which is receiving massive support among the research staff in the CSIC. They are demanding a two-year extension of current short-term research contracts, after evaluation of scientific performance, and the prudent transformation of these contracts based on the tenure-track model. Thus, after years of hesitation, science policy authorities are confronted once again with the need to bridge the gap between science training and scientists employment.

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