conclusion to be drawn, and that is that humans have a strong hereditary predisposition to infertility.

The tendency for low fecundity among the English aristocracy was in fact first studied systematically by Galton in 1869 (ref. 2). There was general concern at the time at the rate of extinction of English hereditary peerages. Galton examined the links between social status and reduced fecundity, and concluded that it was largely due to the tendency for peers — and the sons of peers — to marry heiresses as a means of accruing estates. He speculated that in a patrilineal society heiresses are more likely to arise in small families of reduced fertility, and that marriages with such women would also have a tendency for low fecundity.

Fisher[3] later analysed Galton's data and other genealogical findings in some detail, and concluded that human reproductive success is extremely unevenly distributed and therefore subject to very strong selective pressures. In the 1912 Australian census, for example, 50 per cent of the children were the offspring of one in nine of the men and one in seven women. Three-fifths of all children that were born died unmarried and 11 per cent of marriages were sterile[4].

While Fisher and Galton's writings were tarnished because of their links with the eugenics movement, one clear message is that subfertility is endemic within human populations — albeit hidden in ancestral communities by child-sharing and other devices such as serial polygamy[5]. Moreover, reduction of investment in reproduction is a powerful force for wealth consolidation within a family: a concept that Fisher[3] traced back to Hesiod in the eighth century BC! The link between longevity and reduced fecundity is entirely consistent with the disposable-soma hypothesis discussed by Westendorp and Kirkwood[1].

In an era when infertility is increasingly emergent as a social problem and is now eminently treatable by technological means, we should perhaps be aware of the evolutionary forces that may have helped amplify it.

For males, the strong selective pressure for critical genes controlling fertility on the Y chromosome[6], coupled with highly uneven reproductive success between individuals in any generation, should be considered in any attempt to reconstruct genealogies based on Y sequences. Rather than differential migration rates between women and men, this could possibly explain part of the discordant convergent times for human Y sequences and mitochondrial DNA[7]. While Y chromosome variations are generally considered to be neutral, close scrutiny of actual patrilines reveals that long-term male reproductive success is strongly influenced by politics and social dominance[8].

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1. Westendorp, R. G. J. & Kirkwood, T. B. L. *Nature* **396,** 743–746 (1998).
2. Galton, F. *Hereditary Genius: An Inquiry into its Laws and Consequences* (Macmillan, London, 1869).
3. Fisher, R. A. *The Genetical Theory of Natural Selection* (Dover Press, New York, 1958).
4. Heron, D. *Biometrika* **X,** 419–420 (1914).
5. Neel, J. V. & Weiss, K. M. *Am. J. Phys. Anthropol.* **42,** 25–51 (1975).
6. Lahn, B. T. & Page, D. C. *Science* **278,** 675–680 (1997).
7. Seielstad, M. T., Minch, E. & Cavalli-Sforza, L. L. *Nature Genet.* **20,** 278–280 (1998).
8. Wolpoff, M. & Caspari, R. *Race and Human Evolution* (Westview Press, Boulder, Colorado, 1997).

Why Spanish science is at a standstill

Sir — You reported the case of Antonio Férriz Mas, a Spanish astrophysicist who has taken the University of Salamanca to court after being rejected for an associate professorship[1]. Your editorial[2] made comments on the appointment process in Spanish universities and its alleged role as a significant obstacle to the development of science in Spain. You identified two main problems that prevent Spain's being influential in modern science: cronyism, the practice of favouring one's friends (internal candidates) in university appointments, and the "intellectual sclerosis" of a system based on tenured positions.

Support for the theory of cronyism comes from the fact that two of the five members of an appointment board come from the department or university involved. This suggests that social networks and unspoken agreements cause the selection, not of the most meritorious candidate, but of the one with the appropriate connections. A more adequate alternative might be to have panels that include just one member from the institution offering the position, or no-one at all. However, is it fair to limit so severely a university's contribution to decision-making on strategic issues which affect their long-term functioning, notably the appointment of tenured staff?

Decisions by any appointment board imply value judgements which are accepted, not because of their objectivity, but because their subjectivity is shared to a great extent by the scientific community. Common design is achieved through clear-cut, publicly visible criteria. Stability — permanence over time — is also a desirable criterion, especially when appointments are made on the basis of long-term activities, as is usually the case in science. But even if these requirements are fulfilled, disagreements are still likely to occur. (See, for instance, the recent controversy over the exclusion of Salvador Moncada from the Nobel Prize[3].) It is also plausible, as in any human activity, that from time to time regulations implemented to maintain fairness are overtaken and that biased decisions are intentionally made and adopted. If that is so in Férriz Mas's case the court should say so. But to cast the slur of cronyism on the entire appointment procedure means casting doubts and allegations of corruption on the hundreds of university teachers who have participated in the process, either as panel members or as candidates. To us, that seems audacious, to say the least.

We could certainly debate the adequacy of the criteria followed by different appointment boards, and introduce improvements to the Spanish appointments system, not only at universities but at other research institutions. Certainly, it would be useful to establish some form of broad scientific/academic profile that young researchers can use as a reference for career planning. For university appointments, such a profile should, of necessity, include both research and teaching profiles, especially as tenure positions in Spain imply 240 hours' teaching per year, a significant amount of total labour time.

We fear, however, that even if this goal is achieved Spanish scientific development will still be at a standstill. Why? Because despite Spanish economic advances over the past years, investment in research and development, as a percentage of gross domestic product, is lower now than it was in 1991. It is the second lowest in the European Union, far below the EU average[4], and even lower than in some eastern European states (such as the Czech Republic, Slovak Republic and Slovenia[5]). Furthermore, 43.8 per cent of university teachers, many of whom are highly qualified and experienced, face a dim future as most are under short-term non-tenured contracts[6].

Meanwhile, postdocs like Férriz Mas are sent abroad: 4,554 in the period 1984–94 (ref. 7). But, if the scientific structures and the political will at home remain the same, what's the point?

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1. Bosch, X. *Nature* **396,** 712 (1998).
2. *Nature* **396,** 709 (1998).
3. *Nature* **396,** 614 (1998).
4. Bosch, X. *Nature* **395,** 535 (1998).
5. Koenig, R. *Science* **283,** 22–24 (1998).
6. www.mec.es/estadistica/Cifras99/NAC_10.html
7. Martín-Sempere, M. J. *et al. Política Científica* **47,** 50–53 (1997).