EDITORIAL

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# Innate ability is academic

In many countries, women are increasingly well represented in the natural sciences, although a more even gender balance has yet to percolate up to senior academic appointments. A recent essay by Ben Barres in *Nature* has reinvigorated the debate on gender equality, just as tempers were cooling after the ill-fated remarks of ex-Harvard president Larry Summers. The arguments often revolve around innate differences in scientific ability between the sexes. Interesting as it is, this discussion is based on limited definitive data, which serves only to inflame passions. Importantly, the unassailable statistics that women remain universally under-represented at senior faculty level is certainly not due to any deficiencies in female scientific curiosity or reasoning: even if we were to assume, for argument's sake, that there are subtle gender differences in traits that are a prerequisite for representation at faculty level, this would certainly not affect one sex so significantly that it could not, in principle, yield sufficient numbers of able scientists to staff all academic positions. This would be the case even with sizeable gender differences in average aptitude for scientific research, or if there were amplified differences in the frequencies of elite scientists, Summers's hypothesis that rightly upset many. He was discussing the under-representation of women among researchers with a 1 in 10,000 ability level – the 300 million US population would yield 30,000 elite US scientists (discounting the overseas talent in US academia). Even if women were under-represented in this sample, they could very readily populate all US university science faculties — including Harvard — on their own, if only given the chance. The point is that many people of either sex are highly gifted, but few enter science and even fewer pursue careers in science because they are not given the necessary opportunities or encouragement. Thus, arguments about innate aptitude are often flawed, but, more importantly, they are academic.

Although more women should be encouraged to study the natural sciences, this is not the cause of their under-representation on faculties; actually, many countries now have evenly distributed student populations, even in science subjects. As these student bodies mature, they will boost female faculty rates. However, despite their similar academic performance, fewer women decide to pursue postgraduate research (many European countries have fewer than 30% female natural sciences postgraduates), and this is especially true at faculty level, where representation can decline to single digits. This is where discrimination does have a role and much has been written about sexism in academia. It is hard to accept, for many, that attitudes so parochial should infiltrate the overtly liberal natural sciences. However, available evidence points to a real problem that should be quantified more systematically. Whistleblowers should be encouraged and protected, and disciplinary action formalized.

However, the most important reason for the drop off in women is likely to be sociological. The few fathers that put family before the job can still feel looked down on, while it is expected mothers. Western societies have evolved a 'both sexes work' structure that puts enormous burdens on families and translates into declining birth rates. It is biologically natural that the mother initially takes the dominant parental role; this can easily become the *status quo*, but it does not have to. Society must do more to encourage male parenting and the return of mothers to work. Much can be learned from progressive European countries where paternity leave is more equally distributed. Importantly, the relative uncertainty of a prospective mother's job tenure can encourage hiring discrimination. The logical preventative measure is to force females and males to take equal and significant parental leave. As the child ages, on-site childcare facilities should be provided at the father's and/or mother's workplace. Most academic institutions have demographics that would make this arrangement cost effective.

Some countries have pursued affirmative action to force increased female representation. Arguably, affirmative action is justified to aid in the hiring of a gender-balanced leadership, where scientific record alone is not the sole deciding factor. It may also be suitable for encouraging access to academia by disadvantaged minorities. However, affirmative action seems neither appropriate nor effective when applied to half the population. Barres discusses the under-representation of minorities; however, rather than his examples of trans-gender and homosexual individuals (private matters that should surely remain well beyond the remit of hiring committees), the key is ethnic minorities and the physically handicapped. In contrast to women, they remain under-represented at every level of the academic ladder, and their situation lags well behind that of women.

Peter Lawrence has argued recently that science would be better served if we gave more opportunity and power to the "gentle, the reflective and the creative individuals of both sexes" – traits, in his view, favoured in women. He goes on to lament the increasing aggressiveness in science, stating "for most it is a vicious struggle to survive", and arguing that men are on average more "ruthless" and therefore successful. Lawrence proposes that this allows men to "work their names on author lists" as "in the jungle where we fight to publish salesmanship and pushiness pay off." We would like to add a few numbers from *Nature Cell Biology* to the debate: in the past 12 issues of NCB, 25.3% research papers (24 of 95) had female corresponding authors, while 47% had female first authors. Of the last 380 research papers submitted since May, 22.9% had female corresponding authors. On the other hand, 25.1% of the last 346 referees were women. We are encouraged by these numbers: NCB published a higher percentage of papers from female senior authors and used more female referees than are represented on many biology faculties. Furthermore, if anything, females do slightly better at getting published than men (22.9% female submissions vs. 25.3% published) - something that may surprise Lawrence. Remarkably, almost half our papers have female first authors – this is better than the graduate student statistics of many countries. Let's hope they are encouraged to pursue a career in research!

Further reading on http://www.connotea.org/user/bpulverer/tag/women%20science