The biosciences leaking pipeline

Athena addresses

The biosciences are unique among the science, technology, engineering and mathematics (STEM) disciplines. At the entry point they are attractive to women, who form the majority of undergraduates, but although this pipeline is full at the beginning, it is just not delivering effectively. The costs of the leakage are high, for the individual, for UK science and for the economy.

The impetus for setting up the Athena Project was the unacceptably small number of women making it to the top of science in UK universities. At Athena’s launch, in 1999, Lord Sainsbury, then Minister for Science, expressed no surprise that, in the physical sciences and engineering, women represented only 97 out of 3092 professors. However, what really alarmed him was that, in the biosciences, less than 10% of the professors were women, despite the fact that women represent around 50% of bioscience undergraduates. As the figures below show (Figure 1), 49% of the post-docs in the biosciences are now women, and more are now getting through to lecturer level (37%), but the flow into senior-lecturer appointments, at just 20%, suggests it will be some time before there is any significant increase in the number of women at the top of the academic ladder.

The situation in the research councils is rather different, with women representing only around 15% of the total at the level equivalent to that of a lecturer (Figure 2). Colin Blakemore, the Chief Executive of the Medical Research Council (MRC), speaking at the Royal Society Athena Conference in November 2006, said: “It is significant that the pipeline springs a leak between the tenured and non-tenured track. It is a clear divide, not a gradual trend, what does it mean? It means that the selection process fails or is biased. Whatever the reason is, something happens at that crunch point when we are thinking about employing this person, possibly for good. This is where women fail, so it is up to us to address that process. We have tried to do so through the composition of committees, and clear terms of reference, but it is not yet working.”

In terms of MRC funding support for academics, he made the point: “MRC are not far off equality in the number of applications for fellowships (Figure 3). However, when it comes to applications for grants, there were fewer women in positions which enable them to apply. Women were slightly more successful in applications for fellowships, men in applications for grants. This all reflects the trend for men progressively to get more successful as they go through the system.”

The Athena Project

The problem of women not getting through to the top of science is addressed directly by the aims of the Athena Project — “The advancement and promotion of the careers of women in science, engineering and technology (SET) in higher education (HE) and research, and the achievement of a significant increase in the number of women recruited to top posts.” The beliefs that underpin the Athena Project and its work are that: the advancement of SET is fundamental to quality of life across the globe; it is vitally important that women are adequately represented in what has traditionally been, and is still, a male-dominated area; and, science cannot reach its full potential unless it can benefit from the talents of the whole.
the problems

Figure 3. MRC funding applications and beneficiaries by gender

Athena's work

Athena works in partnership with universities, research councils and SET professional and learned societies. The basis of Athena's work is action, not research. Athena encourages, supports, develops, identifies and disseminates good practice; good practice which is simple, cheap, effective and changes 'how we do things round here'. Some of the changes are in themselves small, but build together to make a difference at both organizational and workplace levels. Athena's programme has three distinct phases, which will be covered in the following sections.

Athena phase one: 1999–2001

Concerned at the difficulty of identifying good practice in university science departments, Athena started by offered pump-priming development grants, each less than £10,000, which were awarded (following an open competition) to twelve universities and five local academic women's networks.

In year one, the focus of the grants was to build Athena's reputation within universities and UK science funding bodies and to create a network of influential contacts. Mentoring, networking and career development programmes for women in SET were identified as areas where 'quick wins' could be obtained through visible and immediate results.

In year two, grants were given to universities for initiatives that tackled the more difficult area — changing the processes, practices and cultures of universities and of scientific research practices.

Work by the Biosciences Faculty — University of Leeds

Athena Case Study 4 describes work in 2000/1 by the Biosciences Faculty of the University of Leeds (www.athenaproject.org.uk), which suggested barriers to promotion were not the reason why, at the University of Leeds, there are so few women at the top; rather that the women were 'diluted out' by an influx of men to senior posts. However, they identified poor people-management skills at all levels, which disproportionately affected those with caring duties, which were mainly, but not exclusively, women. Among the problems they identified were: an appraisal and mentoring system that failed many at the point of delivery; a lack of infrastructure support that meant even trivial tasks could often not be delegated; a male-dominated management hierarchy, which inhibited many women from speaking their minds and that largely just accepted the detrimental effects of maternity leave on women's careers; and, too few opportunities for part-time employment, even as a temporary solution when domestic commitments precluded full-time work.

They also found that men appeared to seek academic posts in order to obtain financial security for their families and not because they viewed them as a preferred career option. Women's financial concerns were more about affordable childcare. Women were more aware of the negative aspects of an academic career at an earlier stage, whereas men obtained lectureships first and then realized that the reality did not match their expectations. Taking this longer view thus seemed to deter women from embarking upon an academic career, even though they admittedly continued to love both the subject and the research environment.

Women who obtained senior lectureships were more likely than their male colleagues to seek further promotion and were equally likely to be
successful. Whereas, at lecturer level, a slightly smaller proportion of women than men put themselves up for promotion.

**Athena phase two: 2002–2003**

In its second phase, from 2002–2003, the Royal Society Athena Awards celebrated the achievements of seven universities in the advancement of women in SET. In 2003, Athena reported to the Government on the good practice in 28 UK universities, and celebrated its first 4 years with a major conference and the publication of a guide to good practice (available at www.athenaproject.org.uk). Experience from the work by the end of phase two showed that, in the short term, small changes can incrementally make a significant difference to the working environment and opportunities for women, and in the medium term, that changes to organisational processes can start to change the culture. The culture of science and of research and HE have been built up over many years and can take a long time to change.

In 2003, as a direct result, Athena recommended targets to be adopted by SET employers:

- **Short term** — the percentage of female applicants for academic and research posts to reflect the percentage of women at the level immediately below (in their own institution and/or in the ‘pool’ of institutions where they usually recruit).
- **Medium term** — the percentage of newly appointed/newly promoted women in research posts to reflect the percentages at the level below.
- **Long term** — the percentage of women at each career level to reflect the percentage at the level below

The Biotechnology and Biological Sciences Research Council (BBSRC) was one of the employers who adopted these targets (see the article by Julia Goodfellow, pages 12–15 of this issue).

**Athena phase three: 2004–2007**

The Athena Project is now in its final phase, which runs through to the end of 2007. The focus for this phase is to embed, measure and benchmark good practice, through two major activities — Athena’s Survey of Science Engineering and Technology (ASSET) and the Athena SWAN Charter. (The SWAN acronym came from one of the network set up in phase one — Scientific Women’s Academic Network).

**ASSET**

There have been three rounds of the ASSET survey. Athena’s purpose in running the surveys was to provide a firm basis from which to understand and address the barriers to women’s progression in scientific careers. The survey questions were based on the areas identified by Athena as key to the differences between men and women’s progression through and enjoyment of a career in science. Respondents were asked about their:

- Career pathways — how they got to where they are now, who their current employer is, what promotion they have achieved, what encouragement they have received to apply for senior posts, any career breaks they have taken and any difficulties they experienced in returning to work.
- Participation — what roles were they involved in beyond teaching and research, such as committee memberships (institution and departmental), external activities and contributions to professional societies.
- Aspirations and expectations — what were their career ambitions, their views on critical career success factors and their knowledge of promotion criteria and procedures.
- Perceptions — what values did departments place on an individual’s contributions and equality of opportunity?

The BBSRC and MRC both took part in the 2004 ASSET Survey findings

- Interview panels — a high proportion of these were either all or mostly male.
- Involvement in external activities — men are more likely to be editors, members of research councils, on grant-giving panels or research-council assessors.
- Men more ambitious ‘scientifically’.
- Men, at earlier stages, are more likely to have been encouraged to apply for senior posts.
- Male scientists have greater knowledge of promotion criteria or procedures.
- Work–life balance — women are significantly more likely to think that time off, awareness, support from colleagues and re-scheduling are as important factors in promoting the work–life balance.
- Transition back to work after childcare — significantly more women view childcare and flexible working as important.
- Women perceive themselves as most disadvantaged in: promotion, salary, visibility to senior management, access to career development and training, research/resource funds, office space and administrative support.
SET survey and have used the findings to establish exactly where action is needed and how have action plans in place. The MRC undertook an analysis of their own ASSET data and none of their findings come as a great surprise (see box): The 2003 and 2004 ASSET surveys together covered male and female scientists working in 40 UK universities and in research council institutions, including 2246 bioscientists. The latest survey ran in autumn 2006 and covered scientists working in all areas of SET employment in the UK. Among the 6000 plus respondents were some 1370 bioscientists, and over 500 members of the Biochemical Society. Results from the earlier surveys are available on www.athenaproject.org.uk, and the results from the 2006 survey will be available later in 2007. ASSET is a rich and relatively untapped source of information, and, as yet, there has little analysis by discipline, something which Athena will redress later this year, if funds permit.

**Athena SWAN Charter and recognition awards**

The Athena SWAN Charter was launched in 2005. It currently has 24 university signatories, 14 of whom have been awarded the SWAN Bronze or Silver recognition. Charter membership is open to all UK universities who are committed to working towards the achievement of Athena’s aims. Charter membership will enable universities to identify themselves as employers of choice. The Charter is the means chosen by the Athena Project to speed progress towards the achievement of its aims by UK universities.

In March 2007, the Department of Biology at the University of York was the first UK bioscience department to receive a Silver SWAN recognition award. Athena is now engaging with the Biosciences Federation and the main bioscience societies to try to agree how best the Charter and SWAN awards can be used to improve the career progression opportunities for women in the biosciences.

**Athena key performance indicators for women and science**

The last phase of Athena’s work has identified the significant areas that determine women’s career progression in science, which ‘translate’ into five key performance indicators

1. A robust organisational framework that delivers equality of opportunity and reward.
2. Appointment, promotion and selection processes and procedures that encourage men and women to apply for academic and research posts at all levels.
3. Structures and systems that support and encourage the career progression of all and enable men and women to progress and continue in their careers.
4. A departmental organisation, structure, management arrangement and culture that is open, inclusive and transparent, and encourages the participation of all staff.
5. Flexible approaches and provisions that encompass the working day, the working year and a working life in SET, and enable individuals, at all career and life stages, to maximize their contribution to SET, their ‘department’ and institution.

During 2007, work will continue to use findings (from ASSET, the good practice identified by Athena, by Athena’s partners and from universities and science departments who have achieved SWAN recognition awards) to develop benchmarks for each of the above. The benchmarks will be used to measure progress by UK universities, research council institutions and their departments towards the achievement of Athena’s aims.

**Athena — the future**

Athena was set up as a project with a limited lifetime. It has received financial support from various Government and charitable agencies. Initially, with the support of the then Higher Education Funding Council for England (HEFCE) Director, Sir Brian Fender, a large grant got Athena up and running, and now, in its final phase, Athena is receiving essential support from the UK Resource Centre for Women in SET (UKRC) and The Royal Society, where the project is housed. Athena employs a very small staff and has benefited from the voluntary time, effort and commitment of a large number of women (and men) in SET across the UK. The authors are the current chair of the Athena Steering Committee, the first chair of the Athena Steering Committee and the Director of Athena.

Athena’s partners and supporters are committed to ensuring that Athena’s legacy continues well beyond December 2007. The future of the Athena SWAN Charter has been secured by joint funding from the UKRC and the Equality Challenge Unit. UKRC have made a commitment on future support for ASSET, and the Athena Committee is currently in discussion with The Royal Society on the best ways to secure the future delivery of Athena’s aim — the advancement and promotion of the careers of women in science in higher education and research.