Summary of the Situation for Women in Physics in Sweden

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Several politically motivated initiatives have led to substantial debate and opened the door to gender equality at many levels of society in Sweden. The undergraduate student body in Swedish universities is at present dominated by women, and female postgraduate students have increased from about 30% in 1986 to 48% in 2004. These statistics are very encouraging for the future, and show that if the career pipeline does not leak, then in 15 years we expect to see many women in leading positions in academia. It is impossible to foresee what will happen in the future, but the story from the past 20 years indicates, unfortunately, that there are barriers to women pursuing academic careers. This paper describes a general picture of efforts to provide women with equal opportunity both on a national political level, and within academia. A report of recent activities within the newly formed national division for Women in Physics within the Swedish Physical Society is also given.

Until about 10 years ago there were few universities in Sweden, and the larger research universities had relatively few professorships that were open for recruitment. In 1993 there were about 2000 professors, of whom about 7% were women [1]. Then a series of reforms changed the structure of the higher-education system, and two initiatives opened new opportunities for women to reach higher ranks. The reform leading to the creation of new, smaller university colleges has probably helped women obtain permanent lectureships. If we look at the elite positions in Swedish academia we see that there are very few women deans, and faculties are generally in the hands of male professors. Important committees within foundations (such as the Nobel Foundation and the Academy of Science) are heavily male dominated [2].

In 1994/95 a bill was approved in parliament funding 30 professorships to be used mainly to recruit women. This affirmative action bill was highly controversial, and led to intensive discussion on both the local and national levels. It was also a surprising infringement on the relative autonomy of the universities. In an interview with female physicists conducted during that period [3], the varying views of women academics were clearly exemplified. One point of view is that being appointed on the basis of gender is not good, but that the unequal treatment of women over the years might be balanced by this one-time effort. On the other hand, many women felt that if women are given priority for these positions, then the recognition that women have been fighting for is put at risk. Finally, in 1999 a gender-neutral reform with the aim of doubling the number of professors was initiated. A new promotion system where qualified lecturers could apply for promotion to the rank of professor created opportunities for both women and men to advance their careers. This increased the number of female professors from 8% in 1998 to about 14% in 2004. This substantial improvement for women could have been even more dramatic if the “pipeline” were not leaking; 33% of qualified lecturers were women, but only 18% of promoted lecturers were female. About 60% of both women and men who applied were promoted [4], indicating that fewer qualified women than men applied for promotion.

How does the picture look for the woman physicist? Two of the professorships funded by the 1995 initiative were within physics, leading to an approximate doubling of the total number of female physics professors. The promotion program led to a larger increase; presently 14 of about 200 professors in physics are women (7%). Since the promotion program was not given any additional funding, the promoted professor generally received a salary increase from the lecturer level. The resulting salary, however, was certainly not in line with salaries drawn by the “old” professors. In terms of the career pipeline, if some assumptions are made about average graduation age given the age distribution of these 14 professors, we can make some estimates. If today’s professors were graduate students in 1988 when 9% of PhD students were female, then the pipeline is not very leaky. On the other hand, by 1990 12% of PhD students in physics were women and the numbers have increased steadily ever since. This indicates that women are leaving physics in disproportionate numbers. An additional factor is that a substantial fraction of current female professors are foreign, indicating an even leakier pipeline for students who have “gone through the system.”
Who is in the pipeline? Women comprise 27% of graduate students, but only about 11% of junior faculty members or permanent lecturers (assistant professor), in total about 35 women nationally. These women have generally completed a 2-year postdoctoral position abroad, and have returned to Sweden on a nonpermanent grant (usually 4 years). During this short period it is essential that they develop an individual profile as a researcher, successfully apply for research funding, and develop the network that is necessary to advance in the system. By this time the female scientist is well aware of the ticking biological clock, and most women choose to start families during this period. If this choice has not been made earlier, then this crucial period often coincides with the largest disappearance of women from physics.

The first junior faculty position is not permanent; in fact it is not unusual to delay permanence for another 4–5 years. Even a “permanent position” in the modern sense requires external funding to finance research projects, and most such positions are funded at a level of about 50%. Due to increasing budget constraints, many universities have not hired any new faculty during the past year. This is a serious barrier to all younger scientists with the aim of pursuing an academic career, but many women are not willing to take the risk. The risk is that the process of getting a position is not straightforward, and is influenced by a number of hidden factors [5]. Another factor is that many women scientists’ spouses are in similar situations.

On the grassroots level there have been significant efforts. The first conference for Swedish women in physics was held in 2001, and it has now become an annual event that inspires many graduate and undergraduate students and provides a lively discussion forum. In 2002 several Swedish women attended the First IUPAP International Conference on Women in Physics in Paris and have initiated several new actions. Within the Swedish Physical Society a division for women in physics was created in 2004 (www.wips.fysik.uu.se/) This constitutes an official body that can provide a platform for change, for discussion, and for inspiration. Similar groups exist in the other Nordic countries and a Nordic Network for Women in Physics has been formed. A workshop in connection with the World Year of Physics will be held in August 2005 in Bergen, Norway.

New efforts on the local plane focus mainly on mentor programs and projects to raise awareness of women’s role in physics. Open discussion on issues that face women in science helps to find solutions and to create supportive environments within academia. Recently it has become more common for PhD students to be offered fully financed positions, which make it possible to take advantage of paid parental leave and provide more flexibility. Male graduate students are increasingly willing to share the care of young children, which is an important factor in career development for their spouses, but also for promoting gender equality. In Sweden there are virtually no nannies for children and the parents are responsible for all child care during at least the first year. There are obvious benefits to this situation, but it has a significant effect on scientific output during this time.

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