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EDITORIAL

Women in science

The number of women entering research laboratories in search of Ph D degrees has been steadily growing over the years. Venerable institutions like the Indian Institute of Science have substantially increased on campus residences for women, in order to accommodate the larger numbers who are admitted each year. While biology used to be an area where the number of women students was the largest, the disparity, between the sexes, in other disciplines has been slowly breaking down. There are still some areas that are surprisingly thinly populated by women. Commenting on the growing crisis in the area of organic synthesis (total synthesis), highlighted in a report in *Science* (1999, July 9, p. 184), Carl Djerassi, a prominent organic chemist and one of the developers of the oral contraceptive had this to say: '... Even worse I know of no serious total synthesis team that has more than a couple of female members. Any practitioner of this testosterone-drenched sub-branch of chemistry should consider what practices deter talented women from even entering such academic laboratories, let alone leading them.' (*Science*, 1999, August 6, p. 835)

Specific areas apart, we may soon see in India, a complete reversal with more women than men being selected through the elaborate processes of admission to our major research centres. This influx of women is undoubtedly welcome and may even bring new and potentially beneficial attitudes to the practice of science in India. The representation of women on the Faculty of major institutes and universities and in the Academies of science is however, still poor. There are conscious attempts to redress this imbalance; approaches that are politically correct but fraught with the dangers of introducing a patronizing 'quota system'. This underrepresentation is indeed a worldwide phenomenon, which is being widely discussed (cf *Nature*, 9 September 1999, p. 99). Politics, where a few highly visible women occupy central positions, is largely male-dominated; so it is with science.

The difficulties faced by women in pursuing research careers are often poorly appreciated or deliberately ignored. With the median age for entering a Ph D programme nearing 23, most aspirants are close to 30

when they eventually obtain doctoral degrees. Ph Ds, in good institutions are becoming increasingly long drawn out affairs for both men and women. Post-doctoral research experience, often up to at least three years, preferably in an overseas laboratory, is a minimum prerequisite for selection to the regular faculty at most prestigious institutions. The inevitable social and biological necessities of marriage and child bearing (and rearing) are responsibilities which coincide with the most critical formative period of a research career. It is hardly surprising, that a majority of prospective women scientists are severely handicapped, in a professional sense, when compared to their male colleagues. Research, when pursued seriously, can be a demanding profession, particularly in terms of time and mental commitment. The few women who are successful in the scientific rat race, usually have supportive families (often with husbands also in science) or are single. Juggling the demands of families and a profession that can be all consuming, is a difficult proposition.

The role models for women in science are many, but their lives illustrate several of the problems which are encountered even today. Marie Curie, one of the 20th century's most enduring icons of science, had Pierre Curie toiling by her side, until his death. Dorothy Hodgkin, probably the most decorated woman in England, was fortunate to have a supportive family and indeed a personality that allowed her to run her research group like an extended family. Barbara McClintock, whose impact on genetics has been profound, ploughed a lonely furrow. So too, did Gertrude Elion, who along with George Hitchings, developed some of the most widely-used pharmaceuticals of our times. The travails of women in science has not been limited to personal sacrifice alone; often the prejudice and arrogance of male-dominated establishments have been major hurdles. Rosalind Franklin, of DNA fame, and Lise Meitner the co-discoverer of nuclear fission are famous examples, where due recognition was denied, even as their male colleagues (and competitors) were highly feted and celebrated by the Nobel Committee. There have been errors of omission

even in the recent past, presumably the result of unconscious bias, even as pressures build for equal opportunity and equal recognition.

Some years ago, in our midst, prejudices used to extend to even selection committees interviewing candidates for entry level research positions; but the clearly superior performance of women students emerging from postgraduate courses has successfully removed this impediment in many places. Times are indeed, changing. Women are here to stay in science, in large numbers. In a country like ours, the entry of women into the research profession augurs well for the future. In our otherwise bleak landscape, this may be the stray silver lining. It is important to ensure that the various schemes that are being designed to facilitate a research career are tailored specifically to meet the demands created by a large number of women in the scientific workforce. Postdoctoral research associate programmes and schemes designed to provide funding for temporary research positions must have flexible age limits and extended duration, with provision for attractive fellowship

enhancements each year. Rules must be interpreted favourably or if necessary modified, to cater to specific needs of women scientists. This will facilitate the reentry into research of women who have taken a break after completing Ph D degrees. Innovative career development schemes that provide stable research support are needed. Our institutions must also develop a more women-oriented façade with significantly better physical facilities. It is sometimes embarrassing that even adequate rest rooms are unavailable at our institutions and venues of symposia; a definite sign that thoughtfulness is not one of our most abundant characteristics. The absence of child care centres (crèches) inside our campuses and at the sites of our innumerable major meetings limit participation of women to a great extent. In many places in the West, these facilities are almost mandatory. Many mundane matters need to be addressed to make life more pleasant for women in science. If these are attended to, life for all scientists, irrespective of sex, may indeed be better.

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