

**Volume III, Number 11- June 2000**

[A Report on the National Symposium on the  
Advancement of Women in Science  
Murderous Science  
Alien Impressions \(or Strangers in a Stranger Land\)](#)

## **A Report on the National Symposium on the Advancement of Women in Science**

**by Karen Fang (G2) and Oksana Korol (G3)**

A casual look at our graduate program may suggest that women in science are no longer discriminated against. After all, women make up more than half of the student body and do not seem to act or to be treated differently from their male counterparts. However, the situation is different at the faculty level.

While the biosciences community can congratulate itself on attracting and retaining women through graduate school, it needs to acknowledge that representation of women declines to 30% at the post-doc level, 20% at the assistant professor application level, and takes a final nose-dive in the tenure committee meetings. This has generally been termed "the leaky pipeline."

A reason for the leaky pipeline may lie in another phenomena called "the glass ceiling" which is an invisible limitation placed on how far women may advance in a group. According to the BBS rotation manual, only forty-three of the 219 BBS faculty are women (19%). The number of tenured women in BBS is even lower, somewhere between the national average of 12.5% and Harvard's university-wide average of 5%.

Moreover, according to the Study on the Status of Women Faculty in Science at MIT, female

Although women outnumbered men at the symposium, the male professors who spoke stressed their commitment to bring more men into the dialogue. Dr. John Dowling, Harvard professor and former chair of the MCB department, said that he did realize how much was missing by not having more women in the department.

While there was a palpable sense of frustration amongst all attendees, the speakers also acknowledge the progress that has been made over the years as a result of changes in gender roles and an increased awareness of gender biases in the workplace.

In particular, professors such as Dr. Helen Davies of the University of Pennsylvania and Dr. Nancy Hopkins of MIT have done much to increase awareness of the problems in academia. Dr. Hopkins, whose initial approach to the dean of sciences resulted in a review of tenure practices in the division of sciences at MIT, spoke of her long-time denial that her gender was a factor in how she was regarded in her department.

Drs. Hopkins and Potter agree that, while

faculty feel increasingly marginalized as they advance in academia. As well as feeling excluded from informal networks, they feel handicapped in the formal decision-making process. This results in less recognition, less lab space, and lower salaries than for their male colleagues receiving similar amounts of external grant support.

Gender equality in the sciences was the focus of the National Symposium on the Advancement of Women in Science held April 21-22 on the Harvard campus. Twenty-one female and two male scientists and educators spoke to participants – students and professionals – about phenomena such as the leaky pipeline and the glass ceiling.

Why do women leave science? Many speakers felt that the time demands of a career in academic science hit women harder than men, because women usually assume greater family responsibility. Faced by the choice between academic career and family, many women leave for careers with flexible schedules and opportunities to take extended leaves.

Ironically, as Dr. Katharine Park, a professor in the History of Science department at Harvard, pointed out, there was a time when women were thought to be naturally good at science because they were "soft and moist" and thus were better able to absorb the material. In modern times, however, these feminine qualities are believed to be unsuitable for the competitive world of science.

Dr. Sheila Tobias, a feminist educator, offered some insights into how science selects between men and women. According to her, sources of gender bias in the sciences can be grouped into three categories: the outside problem of blatant discrimination, the inside problem in which men and women internalize gender stereotypes such that they act

it might be fairly easy to increase the number of tenured women faculty (as was done following the results of the MIT report), the more difficult task is to change the gender schemes internalized by both men and women. Dr. Lilian Shiao-Yen Wu of IBM noted that industry is an appealing alternative for women because it has recognized many women's team leadership skills and has implemented programs to help them ease the burden of having both family and career. An emphasis on team structure rather than one structured around individual investigators has also attracted many women to industry.

Similarly, a transition from individual to group medical practices contributed to an increase in the representation of women in medicine, said Dr. Eleanor Shore, Dean for Faculty Affairs at Harvard Medical School. Dr. Dowling suggested that amending the grant funding policy to include more team investigations may relieve the time pressure on individual scientists and promote the retention of women in academic science.

A number of other policy recommendations were discussed at the symposium, but many speakers returned to the point that not all problems of women in science can be solved by an administrative fiat. Debunking cultural stereotypes is a more difficult task than putting together a committee to equalize pay and lab space distribution, but the participants of the symposium were optimistic that it can be done. For instance, many speakers emphasized the importance of mentoring as a way to establish connections between women scientists at different career stages, starting in grade school.

according to these stereotypes, and what she terms the underside problem stemming from ideology.

Parts of this ideology includes elitism towards those who can and cannot do science, an idea that scientific talent appears early or not at all, a requirement for single-mindedness and a competitive attitude, not to mention the intrinsic conservatism of science.

Other speakers elaborated by noting that many of the qualities of "what it takes" to do science are selected for in boys but discouraged in girls, such that girls who are outspoken and ambitious are marginalized.

According to Chris Korey, a G4 in BBS and one of the organizers of the symposium, a major problem facing young adults is the lack of male role models (in addition to a lack of female role models) who are attuned to the problem of gender stereotyping, frequently pigeon-holed as "women's issues".

Many participants left with an increased awareness of the role that gender plays in the workplace. Implied in many of the talks was that understanding the problem is the first step to finding a solution. The main recommendations of problem identification, overhaul of both local and grant-awarding administrations and the creation of more active role models are important parts of the solution to create a more equal work environment.

[ [back to top](#) ]

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## **Murderous Science**

**by Robin Lucas (G6)**

"The stronger must dominate and not blend with the weaker, thus sacrificing his own greatness...if this law did not prevail, any conceivable higher development of organic living beings would be unthinkable...Those who are physically and mentally unhealthy and unworthy must not perpetuate their suffering in the body of their children." These ideas presented in 1924 by Adolf Hitler in his book *Mein Kampf* were not new. Since the beginning of the 20th century, such opinions had helped to fuel eugenic movements not only in Germany but also throughout Europe and the United States as well. Due to support from leading geneticists of the day, these movements maintained a veneer of scientific respectability that lent credence to their claims and provided politicians a "scientific" basis for legalizing oppressive eugenic measures.

Nowhere in the world was the collaboration between geneticists and government officials more destructive than in Nazi Germany. Some of the sordid details of this alliance are described in the book *Murderous Science: Elimination by Scientific Selection of Jews, Gypsies, and Others in Germany, 1933-1945* by Dr. Benno Müller-Hill. Dr. Müller-Hill is a professor from the Institute of Genetics at the University of Cologne and the author of *The Lac Operon: A History of a Genetic Paradigm*. In 1981, he decided to use his sabbatical to research genetics in Nazi Germany because

In his book, Dr. Müller-Hill describes two sorts of German scientists during World War II: those who "blinded themselves to the truth" and those who went "all the way to the final solution." As he points out, "...there came into being a remarkable community of self-blinded internal exiles coexisting with the annihilators..." An example of this was the collaboration between Professor von Verschuer, who served as Director of the Kaiser Wilhelm Institute of Anthropology, and Dr. Josef Mengele, an SS officer who conducted experiments on Jewish and Gypsy twins at Auschwitz. These experiments involved deliberately infecting twins with infectious diseases such as tuberculosis and examining their blood for abwehrfermente (defensive enzymes), proteolytic antibodies "discovered" by Emil Abderhalden in 1909 and later proven to be the mythical products of fraudulent research (*Nature* 393: 109-111). During his talk, Dr. Müller-Hill provided evidence that von Verschuer was not only aware of Mengele's research but had written a proposal to help fund these experiments. In fact, von Verschuer sent a number of progress reports to ensure continued funding of these projects, making it clear that he was collaborating with Mengele by analyzing blood samples taken from

he could find no suitable books on the subject at that time. In 1984, he published his book, and sixteen years later, he continues to tell the story despite an icy silence from many of his German colleagues.

On March 29th, Dr. Müller-Hill began his seminar at HMS entitled "Genetics in Nazi Germany" with the title of a book written by German geneticists in 1919 called *Menschliche Erblchkeitslehre und Rassen-hygiene* (*The principles of human heredity and race-hygiene*). This first German textbook on human genetics consisted of two volumes, the latter devoted to eugenics. The publisher sent a copy to Adolf Hitler while the future Führer was imprisoned in 1924. Hitler clearly read the book and used the scientific justifications for race-hygiene (the German equivalent of eugenics) to strengthen his own arguments in *Mein Kampf*. Indeed, when one of the textbook's authors, Fritz Lenz, wrote a review of *Mein Kampf*, he was quick to note that certain passages were obviously based on his textbook. He concluded that Hitler was the only politician at that time in Germany who understood anything about human genetics.

In fact, the Nazi Party was the only political party in Germany that agreed with one key objective of the race-hygienists, i.e. the forced sterilization of the physically and mentally impaired. Dr. Müller-Hill credited this unique position of the Nazi Party as the main cause for the anti-Semitic bent in Germany's race-hygiene movement (anti-Semitism was not so emphasized in other eugenic movements elsewhere). Since the Nazis were the only ones to embrace extreme eugenic ideals, German geneticists became their allies. As such, they had to accept the violent anti-Semitism of the party or risk losing Nazi support of their eugenic programs and legislation. In turn, the Nazis accepted the scientific arguments for race-hygiene and

"200 people of different racial groups." Much of this analysis was performed by Dr. Gunter Hillman, a biochemist working in the laboratory of Dr. Adolf Butenhandt. Budenandt won the Nobel Prize for Chemistry in 1939, directed the Kaiser Wilhelm Institute for Biochemistry, and later became the head of the prestigious Max Planck Society.

After the war, many scientists who had exploited victims of the Nazi concentration camps for their research returned to academia. Many of them claimed that they didn't know what was going on in places like Auswitz and, since they didn't commit murder themselves, were never punished. Though Dr. Muller-Hill recognizes a distinction between those who actively killed and those who benefited indirectly from the killing, he asserts: "Academics cannot simply be divided into two groups, the blameless and the criminals. Not only murders, but lesser crimes also, are reprehensible." His book specifically names scientists like von Verschuer, Lenz, and Fischer, describing their wartime activities in detail. Yet, these perpetrators of "lesser crimes" were the mentors of today's academic leaders in Germany, making Dr. Muller-Hill a bit unpopular with some of his peers. According to him, though favorable reviews of his book have appeared in *Nature* and *Science*, it was greeted with "total silence" when it first appeared in Germany in 1984. He adds: "They remain silent to this day." Recently, Dr. Hubert Markl, president of the Max Planck Society, authorized a group of independent researchers to open the Nazi era files of Dr. Butenhandt. This step marks the beginning of a five-year investigation into the roles of German

relied on scientists to provide the necessary technology and expertise for achieving their goals, including the "final solution of the Jewish question."

In 1934, the *Gesetz zur Verhütung erbkranken Nachwuchses vom 14. Juli 1933* (*Law for the prevention of progeny with hereditary defects*) was published along with explanatory comments written by German doctors. This law allowed scientists to force the sterilization of an estimated 350,000 people, mostly women judged to be of low intelligence. Although the law did not authorize them to do so, scientists also sterilized individuals referred to as "anti-socials," including Gypsies and about 600 black children in Germany. As the war approached, race-hygienists insisted that anti-Semitic measures were also scientifically necessary. Many Jews sought to escape persecution by claiming that their Jewish fathers were not their true biological fathers. Here again, the German geneticists played an important role - that of resolving paternity cases. As the situation worsened for Jews in Nazi Germany, these often became life or death decisions. Ultimately, some scientists would become much more active in the mass murder of Jews, Gypsies, and the mentally and physically handicapped during World War II. Their activities included selecting those individuals who would be sent to extermination centers, training SS soldiers in genetics and eugenic principles, building gas chambers, and overseeing killings.

academicians in Nazi activities. Whether this means that German scientists are really coming to terms with their past remains to be seen.

Dr. Muller-Hill ended his talk with the question, "What is the bottom line?" His answer: "...that science produces only one value and this is honesty and truth and nothing but that...The major mistake is that scientists think their science produces more...that science allows them to distinguish between good and bad.... but good and bad, these are questions which are only answered by religion and not science." To illustrate his point, he discussed a recent article entitled, "Spotting Bad Seeds" (*Science* 287: 423) The term "bad seeds" referred to aggressive young people. Here again, he claimed, scientists are making a value judgement. "I must say, I find it awful," he said, "It is very dangerous." At the same time, Dr. Muller-Hill argues in his book that scientists must try to anticipate how society will interpret (and perhaps misuse) their findings: "It is the duty of human geneticists to predict the possible social consequences of genetic research and to act accordingly."

[ [back to top](#) ]

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## **Alien Impressions (or Strangers in a Strange Land)**

This Mother's Day weekend, the "Million Mom March" took place in Washington D.C. and was supported by many other smaller anti-gun demonstrations in several other towns and cities throughout the USA. As expected, the march drew howls of scorn and derision from NRA supporters and cowboys, who believe that guns don't kill people. They believe that the constitution, drawn up 225 years ago when weapons took minutes to load, protects the right of "decent" law-abiding citizens to bear arms. The ambiguous nature of the second amendment notwithstanding, it is pertinent at this time to ask what is the nature of a "decent" law-abiding citizen, since this is the shield that gun lobbyists often hide behind.

The last time I checked, members of our society had no distinguishing features that allow us to be sorted into "law-abiding" and "non-law-abiding". For instance, a short drive down the Mass Pike will quickly reveal that owning a vehicle and being a "decent, law-abiding" citizen are mutually exclusive. A quick trip through my hometown of Natick during the water ban last year revealed that even the town of Natick is not law-abiding, not to mention many of the businesses and people it contains. So, before you get too smug in your status as "law-abiding", how many of you have flouted IRS laws, seen resumes with blatant lies on them, heard about unwarranted expense claims, or stolen from your employer

calls on a business telephone? How many students have cheated in an exam (come on, admit it!) or stolen copyrighted music by downloading MP3 files via the Napster website? Or to look at it another way, if your neighbour was arrested as a felon would you respond to the inevitable reporter with "we're all so shocked -- they were such a nice quiet friendly family and never caused any trouble", or would you remark "no-one is surprised; they were clearly non-law-abiding citizens and we all expected this to happen"? Perhaps things would be easier if only the criminals had guns, as in most other developed countries - they would then be "non-law-abiding citizens" by definition. Finally, imagine the carnage that would ensue in England, for example, if our famed soccer hooligans were armed to the teeth with hidden Saturday night specials or worse, automatic weapons! It would make the state of Texas look like Disneyworld.

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[ [back to top](#) ]

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