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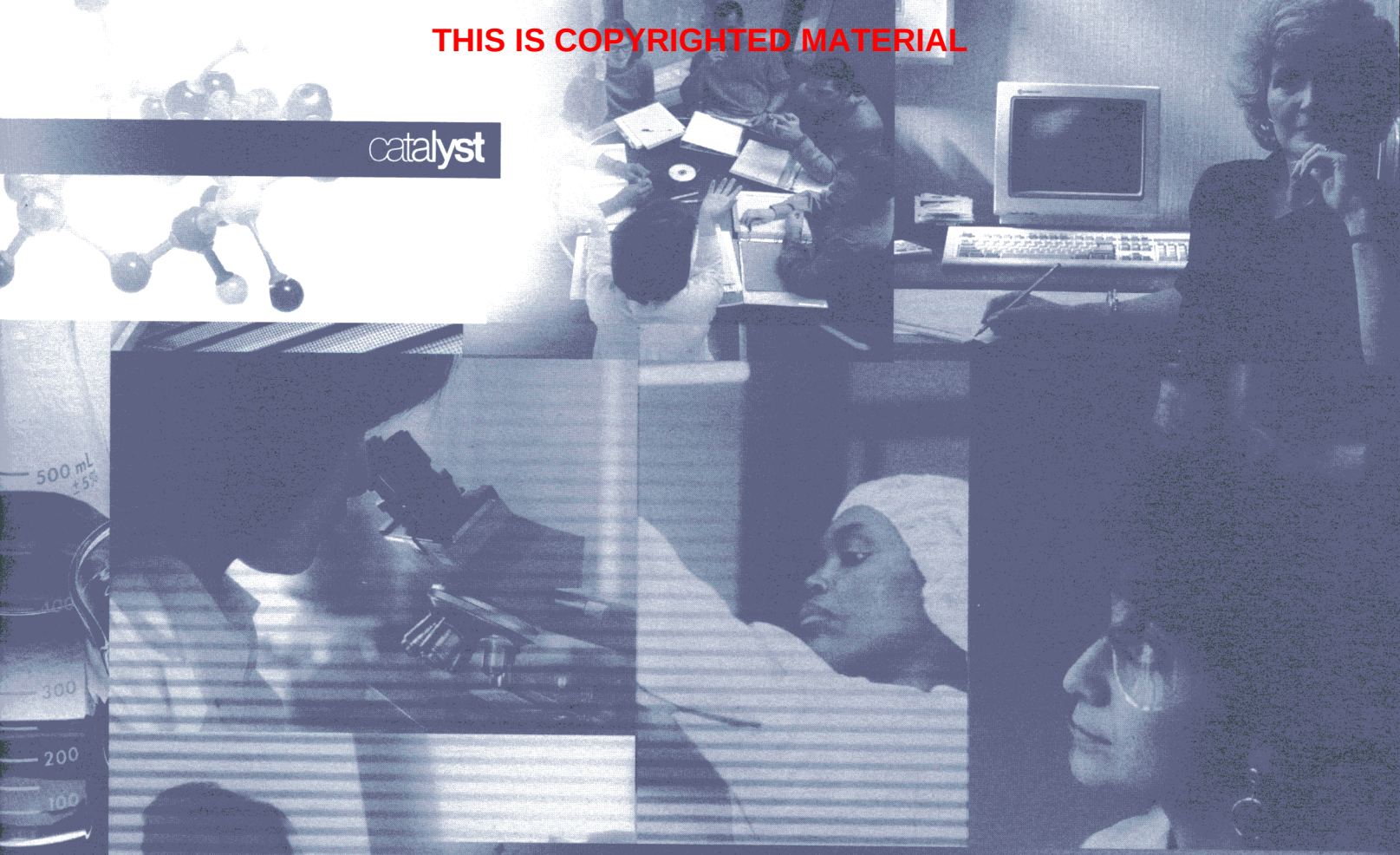

Women Scientists in Industry

A Winning Formula for Companies

Women Scientists in Industry: A Winning Formula for Companies

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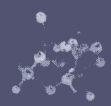

It is my pleasure to present this latest Catalyst report, one in a series of Catalyst's occupation-based studies. *Women Scientists in Industry: Making It In Both Management and Technical Roles* is the culmination of two years of investigation of the women in the business end of science—those that have chosen industry over academia. We learn their views on where they've been and how they got to where they are now, as well as what their prospects are for the future.

As Catalyst continues to study women in a variety of fields, we keep discovering both similarities and differences from one research population to the next. The similarities are striking: Just as we did in our studies of women in sales and women in engineering, we find that women have many things to surmount in the corporate world—and that they're well on their way to surmounting them, and succeeding beyond what anyone might have thought possible a generation ago. The differences are equally fascinating: Women in technical fields, of course, as opposed to those in management generally, must establish a reputation in their particular fields of expertise first, then go on to get their management experience if they wish.

In the pages of this report, you'll find not only the data you'd expect about women scientists, but also a wealth of anecdotal material giving some sense of the rich tapestry of these women's lives, and the wide variety of experiences they've undergone in their climb upward in the corporation. There are also some tips for women who want to follow in the footsteps of these very successful women scientists.

Most heartening to me, all but a few of the women scientists we interviewed are highly optimistic about the future of women scientists in industry. So perhaps we can begin to substantiate the claim that times have changed and the path for women has eased and expanded—at least in the field under study here. In any case, we're proud of these women and all they've accomplished. They've paved the way for all those who come after them.

Sheila W. Wellington

Sheila W. Wellington
President, Catalyst

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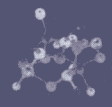

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Introduction

Despite an increasing presence in university science programs and numerous social, economic, and legislative changes over the last 25 years, women remain under-represented in the business end of science. Women are 45 percent of the workforce, but they make up only about 12 percent of the employed scientific and engineering labor force in industry (Statistical Abstract of the United States, 1996). Research on the progress and prospects of women scientists in corporations over the past 25 years has been minimal.

The business case for expanding our knowledge in this area is clear. The gender gap in science education is decreasing. Between 1975 and 1995, the percentage of total science doctorates earned by women increased from 16 percent to 31 percent; the percentage earned by men decreased accordingly, from 84 percent to 69 percent (U.S. National Science Foundation, 1995). As this trend continues or even accelerates in the next century, the imperative for businesses to recruit, retain, and advance talented women scientists will become increasingly evident. But companies seem to have scant knowledge about recruiting and retaining this highly marketable talent pool.

Table 1: Percentage of Doctoral Degrees Earned by Gender and Field

	1975	1985	1995
Total Science			
Women	16	26	31
Men	84	74	69
Physical Sciences			
Women	9	16	23
Men	91	84	77
Earth/Atmospheric/Ocean Sciences			
Women	5	18	22
Men	95	82	78
Biological & Agricultural Sciences			
Women	19	29	38
Men	81	71	62
Computer Sciences			
Women	0	11	19
Men	0	89	81

Source: National Science Foundation, Science Resources Studies Division, *Selected Data on Science and Engineering Doctorate Awards:* 1995

From the late 1970s through the 1980s, much research focused on uncovering the reported gender bias in education that discourages women from pursuing or excelling in the sciences. The first forum for talking about successful women in science, was a 1972 conference, "Women in the Sciences: Determinants of Success," sponsored by the New York Academy of Sciences. The women themselves discussed family attitudes, relationships, and the impact of education and economic factors on their success. The meeting was truly pioneering because during the 1971-

72 academic year only 14 percent of master's degrees and 6.7 percent of doctoral degrees in the physical sciences were earned by women.

By 1993, the Committee on Women in Science and Engineering of the National Research Council published a report titled *Women Scientists and Engineers Employed in Industry: Why So Few?* The research was based on case studies of six companies and included examples of effective corporate strategies to recruit and retain women scientists, while also presenting the barriers inhibiting the progress of women scientists in industry.

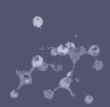
More recent studies of women scientists continue to concentrate on those pursuing academic careers. Gerhard Sonnert and Gerald Holton, authors of *Gender Differences in Science Careers* (1995), claim that success is easier to measure in research science than in other sectors because academics advance through a rigid and narrow career path. However, if researchers want to discover what is really happening to women in science, they will have to study those in industry. In the physical sciences and in engineering, more scientists of both genders are entering corporate careers after completing their Ph.D.s than are joining university faculties.

Recent History

In 1998 the New York Academy of Sciences convened a follow-up to its 1972 conference in order to see what had happened to women in science since then. (Catalyst Vice President Mary Mattis ran a panel at the conference. Highlights from the panelists' frank, illuminating remarks are in special boxes sprinkled throughout this report.) Planning for the meeting, *Choices and Successes: Women in Science and Engineering*, stimulated Catalyst's interest in studying this topic. Catalyst had already conducted extensive research on the barriers and success factors affecting the career mobility of women executives. In 1996, we published *Women in Corporate Leadership,* a quantitative survey focusing on the career expectations and experiences of women executives. Earlier we also looked specifically at the experiences of women engineers in *Women in Engineering: An Untapped Resource* (1992).

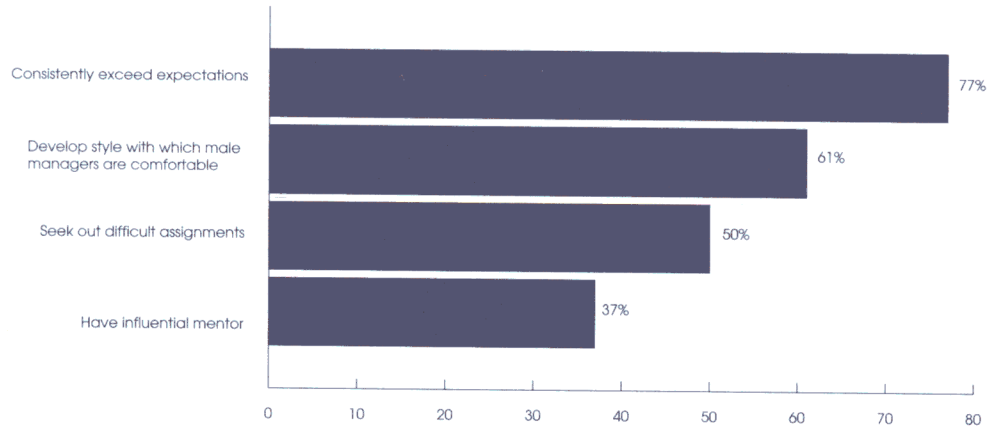
In that study, women engineers reported several key barriers:

- Male managers don't have as much experience evaluating women, the women in our study believed, so they are overly cautious about promoting women.
- These women believed male engineers are promoted on potential, whereas female engineers advance only after they have proven repeatedly that they can perform in a given position.
- Male managers often protect women from assignments in manufacturing plants and field sites that are perceived as dirty or rough. Those experiences, however, are seen as critical for advancement and the careers of women engineers are seriously limited when they are denied such assignments.
- Women engineers lack role models and mentors to assist them as they move up the corporate ladder.



Women in Corporate Leadership echoes several of these findings. It focuses specifically on the success factors and barriers experienced by women executives in Fortune 1000 companies. Catalyst surveyed 1,251 women who held titles of Vice President or above and asked them what contributed to their success. The most frequently cited success factor was "consistently exceeding performance expectations." It is not surprising that these women were high achievers and clearly exceptional performance is required of successful male executives as well. However, the second most commonly cited strategy was "developing a style with which male managers are comfortable." Working hard was not enough; these women said they had to adjust their personal style to fit in to the male corporate culture.

Graph 1: Critical Success Factors for Female Executives



Source: Catalyst, *Women in Corporate Leadership: Progress and Prospects*, 1996

Survey respondents also reported that seeking out difficult assignments and having an influential mentor were critical to their career success. Stretch assignments were important both for professional growth and for gaining visibility among key decision-makers in the company. Such contacts can be very valuable for future advancement. Mentors also played a crucial role in career mobility. Executive women described being taught by male mentors how to manage their careers, promote their ideas, and navigate corporate politics.

Despite their success, survey respondents were also aware of factors in the corporate environment that hold women back. The most commonly cited barriers were "male stereotyping and preconceptions" of women and "exclusion from informal networks of communication." These findings are linked with the style issue mentioned earlier. Women have to work harder to be accepted in a male environment and overcome assumptions about their abilities and dedication to work.

Rationale

In conversations with corporate decision makers Catalyst frequently heard that business organizations experience difficulty in recruiting and retaining women scientists and in advancing them to management roles. For example, in 1998, while women represented nearly half of managerial and professional specialty occupations, they represented only a third of chemists, and slightly more than a quarter of computer systems analysts and scientists.

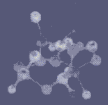
Table 2: Women's Employment by Various Fields

	Women	Men
Managerial and Professional Specialty	49	51
Biological and Life Scientists	39	61
Chemists, except Biochemists	33	67
Computer Systems Analysts and Scientists	27	73
Geologists	12	88

Source: National Science Foundation, 1998

Although they may not have developed a specific business case, companies know that they need to include women and people of color for more diversity among their bench scientists and managers, and can generally articulate the broad-based business rationale for diversity, including the following points:

- The new economy has put companies in a race for scarce technical talent. Recruiting and retaining technical talent is critical to competitive positioning in the fast-paced businesses that employ scientists, and women have attained a critical mass among the doctorate recipients from which these companies recruit:
  - -in 1996 women made up 20 percent of recipients of doctoral degrees in the physical sciences (includes mathematics and computer sciences) compared to four percent in 1966;
  - -women's representation among doctorate recipients in life sciences increased from 11 percent in 1966 to 43 percent in 1996; and,
  - -during the same period, the percentage of professional/other doctorates granted to women increased from 15 to 38 percent.
- In order to attract the best new female talent and retain a critical mass of seasoned women scientists, companies will need to develop and advance their existing pool of women scientists to serve as role models, mentors, and magnets for future cohorts.
- Research on teams demonstrates that diversity of perspectives enhances creativity and innovation (McLeod, Lobel & Cox, 1996). Women and people of color bring different perspectives that companies need in order to develop new products and improve existing ones.
- Women have insights into the needs and motivations of their companies' female customers and clients that are critical to marketing and sales activities and outcomes.



- Increasingly, companies are aware that lack of diversity on project teams and among management may put them at a disadvantage in bidding for contracts and in business-to-business sales.

Research Methods

In the early stages of this research, Catalyst first conducted focus groups with 35 women scientists at three Fortune 500 companies. The companies were selected on the basis of their commitment to the advancement of women scientists and/or the initiatives they had developed to address concerns related to women scientists' career paths. Data from the focus group discussions helped us develop the protocol for the individual interviews with 30 women scientists on which this study is based.

Because of the relatively small number of women scientists in Fortune 500 companies, we identified the women we interviewed through a "snowball sampling" technique: senior women scientists in Catalyst's database of executive women were approached with a request for an interview; these women (as well as those in the focus groups) were also asked to identify other senior women scientists in their personal network. As a result, the 30 women who were interviewed for this study are a select group of successful and often highly visible women who are either in the pipeline for or already in senior technical or managerial roles in their companies.

Questions explored both success factors and perceived barriers to advancement that the women had encountered. Specific areas of inquiry included educational background, job history, developmental assignments, career goals, career detractors, the role of informal networks, visibility, and the impact of family responsibilities on career. All findings are based on this qualitative data and the quotes presented throughout the text illustrate major themes voiced by participants.

This small sample study does not claim to be representative of all women scientists working in industry. Rather than reaching definitive conclusions, Catalyst seeks to generate hypotheses and stimulate discussion about women scientists' career paths as well as proffering ways in which corporations can best capitalize on female talent.

Profile of Respondents

Generally speaking, the women who participated in the initial focus groups represented a range of industries and included both seasoned and junior women who had either managerial or technical responsibilities.

The majority of the 30 women who participated in the interview phase of the research had earned a doctorate (25). The remainder, who had either a Masters (3) or a Bachelors (2) degree, reported that they intended to complete their Ph.D., but had found they did not need that credential for career advancement in their company.

My career ended up taking a very different turn than what I had gone to school for in the first place. So I never completed the dissertation.

(VP, Research & Development)

I did seriously consider pursuing a Ph.D. before I came to work here. But when I interviewed they convinced me that it didn't make any difference whether or not I had a Ph.D. I could get started on my career three or four years earlier if I came directly.

(VP, Research & Development)

We characterize five of the women as pioneers—corporate women scientists who earned their doctorates in the 1950s or 1960s and were among the first women scientists to be employed by their companies. The remainder of our sample completed their degrees during or after the 1970s. The majority of respondents were trained as chemists, although the sample did include biologists, physicists, and pharmacologists.

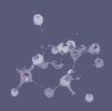
Twenty-two of the women in the study are on the management track, as opposed to the technical one, in their corporations. The distinction between these two career tracks differs by company, but typically women on the technical side work in labs running scientific experiments. These scientists are responsible for managing projects and often supervise small teams of technicians. In contrast, women on the management track do not create products or processes, but rather manage large groups of technical staff. Some are primarily technology managers, while others have advanced to positions involving general management or line responsibilities. The differences between these roles will be discussed further in the section on barriers to women's advancement.

The women in this study work or have worked in a wide range of industries including aerospace, automotive, building materials, chemicals, cosmetics, petroleum, pharmaceuticals, tobacco, and waste management. One woman had significant career success in academia, business, and government. Three other respondents managed to have careers in both the academy and in business, while one woman combined business and government.

Sixteen women hold titles of vice president or above; six are directors, six are project managers, and two are fellows.

Table 3: Respondents' Titles

Vice president or above	16
Directors	6
Project managers	6
Fellows	2



Four of the study participants were women of color: three are Asian; one is Hispanic. Two-thirds of the women in this study have children, seven women were married with no children at the time of the interviews, and two women are single with no children.

Table 4: Respondents' Marital Status

	Marital Status
Married with children	21
Married, No children	7
Single	2

About Catalyst

Catalyst is the nonprofit research and advisory services organization that works with business and professional firms to advance women. The organization has a dual mission—to enable women in business to achieve their full professional potential and to help employers capitalize on the talents of their female employees.

Catalyst has published pioneering studies on dual-career couples, parental leave practices, and organizational "glass walls" separating staff and line functions in corporations, documenting their impact on women's advancement. Catalyst has also documented barriers to women's advancement on corporate boards, in sales, and in engineering.

Overview

Catalyst initiated this small study of 30 successful and highly visible senior women scientists to generate hypotheses and stimulate discussion about women scientists' career paths and about how companies can best capitalize on female talent. The women we interviewed were already successful corporate leaders or were in the pipeline to achieve that role. We wanted to learn from their individual career strategies how women scientists as a group can progress through the corporate ranks, as well as to be able to compare this group's experience with those of other groups we have studied.

Knowing how crucial the work of science and technology is to the nation and to the world, Catalyst aims to encourage women's inclusion in this ever more significant aspect of the global economy. We also recognize how technical expertise and knowledge can be, more now than ever, a road to the top in American business. And we want to make sure American professional women are on that road.

Our first finding speaks to the paucity of women scientists in Fortune 500 companies:

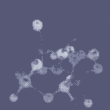
1. **Female graduate students in the sciences remain uninformed about potential careers in business.** Over half the women (17 out of 30) said they were given little or no information about the corporate job market when they completed their academic studies. Only two women worked as interns in industry during the course of their academic studies. The women we interviewed learned about job opportunities from head hunters and corporate recruiters, but university advisors prepared them solely for academic careers, automatically assuming their best students would prefer such a choice.

   This presents an opportunity for industry, because:

2. **Academia is viewed by many as unwelcoming to female scientists.** Although all the women in our study are employed in the business sector, nearly a third (9 out of 30) of them chose that arena not because they knew anything about it, but because they did not feel welcomed into academia. Some hypotheses about women's relative lack of progress in universities are: low turnover due to tenure and lack of a bottom-line case for change. Three women in the study also raised the issue of how difficult it is for dual-career academic couples to find jobs in the same geographic area.

Another opportunity for industry emerges in our third finding:

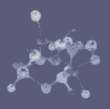
3. **Women in our sample were attracted to applied science and product development.** These women (18 out of 30) perceived industry as offering a faster-paced and more diverse career path, as well as economic stability and freedom from grant-writing to support their research projects. These women did not, however, have rigid ideas about what a successful career should look like. They were attracted to companies that sought them out and provided specific information about opportunities and rewards.



4. **Women scientists in corporations face a myriad of organizational barriers, many of them similar to those named by the senior corporate women studied in Catalyst's 1996 report, *Women in Corporate Leadership*.**
   - *Absence of female role models.* Like other women professionals, female scientists are seriously under-represented among senior managers in American corporations. In Catalyst's most recent *Census of Women Corporate Officers and Top Earners* (1998) we found that just 11.2 of corporate officers were women. Among the 40 corporate officers who held senior titles in research that year only two were women.
   - *Isolation.* These women often describe a discomfort zone in their interactions with male supervisors and colleagues. They report feeling isolated from their male colleagues.
   - *Stereotyping and preconceptions.* All but three of the women in our study report they had to struggle against the perception that science was a male pursuit.
   - *Differences of style.* Several women mention how different styles of communication between men and women can affect how one's ideas are received.
   - *Lack of mentoring.* Management cannot assume that women will find mentors through the same informal mechanism that men use. Among women in this study, a successful transition to management is often associated with having a strong mentor—usually a male.
   - *Lack of line experience.* In most corporations research and development are regarded as staff functions. Whether or not they personally wanted to assume profit-and-loss responsibilities, many of the women we interviewed understand that lack of line experience is a barrier to women's advancement.
   - *Work/life balance.* Twenty of the 30 women in the study have children. Only one woman had taken advantage of her company's formal flexibility program. Many had had difficulties around maternity leaves. Nearly half of the married women report that a supportive husband is critical to their balancing ability.
   - *Exclusion from informal networks.* Women report they are much less likely than men to be invited to events held after work or asked to participate in sports activities.
   - *Risk-averse supervisors.* Reportedly, male managers believe promoting women is riskier than promoting men.

Catalyst believes that industry must address these barriers if women are to advance to the highest level of corporate leadership. In the meantime, we report on the successful strategies women scientists in our study devised to get ahead:

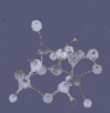
- *Cultivating technical expertise.* According to study participants, women scientists must prove their ability to carry out basic technical procedures—procedures which their male peers are assumed to have mastered. Developing a clear technical niche can counter backlash if it makes clear that a woman is providing a particular skill that no one else can provide.
- *Developing a successful style.* These women emphasize the importance of a positive attitude, as well as minimizing one's difference from the dominant, male style.



- *Obtaining stretch assignments.* Such assignments give women an opportunity to demonstrate their abilities and gain a high profile.
- *Having Mentors.* Over half the women we spoke to acknowledge being helped up the corporate ladder. When asked what a mentor provided, the most frequent response was that a mentor helped the mentee understand and navigate corporate policies.
- *Networking both within and outside the company.* One way to develop an internal reputation is to network externally, but our participants also acknowledge the importance of gaining visibility with senior scientists and executives within their organizations.

Despite whatever hurdles the women in our study had faced and those that women overall are still facing, the women we interviewed are optimistic about women scientists' advancement in corporations. These women have witnessed enormous changes in the last three decades and believe the positive trend will continue. Some even doubt their ability to give advice to younger colleagues because business and science has changed so much from when they started out.

On the basis of these interviews, Catalyst has formulated recommendations for women and for companies (see page 38). We have also identified eight companies that have been successful at the recruitment, retention, and advancement of women scientists. Their best practices are described in detail at the end of this report.



Chapter 1: Academia or Business?

Tough Choice, Little Information

> *"Women have to have complete confidence in themselves. We have to believe that we are dead right and pursue our science and our goals with that inner assurance."*
>
> Frances Allen, first woman Fellow at IBM
> at the 1998 Conference *Choices and Successes: Women in Science and Engineering*,
> sponsored by the New York Academy of Sciences

Companies may not be doing a good job marketing themselves to potential female candidates. Whether or not to choose a corporate career is an important decision that faces all scientists. While MBA candidates and engineers will naturally enter the business world, scientists must choose between pursuing academic or industrial research. Almost all of the women we interviewed said they had little or no information about the corporate job market for scientists when they completed their academic studies. University advisors prepared them for academic careers and automatically expected their best students to pursue the same path they had.

In fact, academic advisors are generally not in a position accurately to describe or promote opportunities for research in industry. In only one case out of the 30 we studied was a respondent actively encouraged to pursue a career in industry—by a professor who had previously held such a position. Without contact from corporate recruiters, many male and female students are and will be misinformed about science in the private sector. Several of our respondents say that lack of information was coupled with an attitude among their classmates that entering industry was "selling out." One woman describes listening to two academic women talking in a taxi on the way to a science conference:

> *They said it's a sellout for scientists to go into industry . . . and I didn't say anything but I was appalled and realized that a lot of people have that attitude . . .I didn't sell out. I'm not here for the money, I'm here to bring drugs to people who are very sick. My efforts and my work are just as important as whatever noble thing they think they're doing.*
>
> (Research Fellow, Pharmaceuticals)

A question that requires further research is whether more females with science degrees would opt for a career in industry if they knew more about opportunities in the private sector. Comments from respondents in this study suggest that companies may not be marketing themselves effectively. Sending headhunters onto campuses may not be enough. Companies might consider strengthening their links with universities while informing academics about career opportunities in industry. (see Chapter 5, Best Practices)

Why They Choose Industry

When asked what attracted them to a career in industry, nine women out of 30 mention negative aspects in the academic environment as a reason for pursuing a position in the private sector. For some of the women, a specific event or interaction caused them to reconsider working in a university setting.

> *During my post-doctorate I prepared for interviewing in academia. And I can tell you that it was less than a positive experience. Extremely disappointing. And I had networked well to go into academics, but boy when you start interviewing . . . there definitely was some sexist behavior I wasn't comfortable with.*
>
> (Director of Manufacturing)

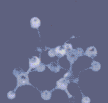
> *One of the professors on my Ph.D. committee said he would never hire a skirt in his department.*
>
> (Technical Director)

These women are also responding to what they perceive to be future opportunities. Two or three decades ago, these women scientists could not choose industry over academia based on track record. Neither sector offered many female role models so many of these women took a gamble on industry.

> *I looked around at how many women were doing well in academia and at the time they weren't running labs or getting real positions of power. But at the time industry was really starting to get on board about women.*
>
> (Technical Director)

This study is not designed to be a comparative analysis of career opportunities for women scientists in industry versus academia. Clearly all of the women we interviewed chose to spend significant portions, if not all of their careers working in the private sector. The four women who worked in both universities and business spoke highly of both sectors and did not compare their experiences. The nine women who cite negative experiences with or perceptions of the academy volunteered that information. And when Catalyst reported on this finding at the 1998 conference, several conference participants mentioned women's relative lack of progress in universities compared to industry today.

Change at academic institutions is hypothesized to be slower because of low turnover due to tenure, the elimination of mandatory retirement for academics in 1993, and lack of a bottom-line case for change. Three women in our study also raise the issue of how difficult it is for dual-career academic couples to find jobs in the same geographic area. One woman was told she was qualified for a teaching position, but could not be hired because her husband was already employed by a different department within the University. Although academic research was her first career choice, she accepted a corporate position to avoid relocating and leaving her family for long stretches of time. There is some indication that universities are eliminating these so-called "nepotism" rules.



The subject of gender bias in universities has received widespread press recently. A comprehensive study in the school of science at MIT found that senior women faculty "feel marginalized and excluded from a significant role in their departments. . . Examination of data revealed that marginalization was often accompanied by differences in salary, space, awards, resources and response to outside offers." (MIT Faculty Newsletter, Vol XI No. 4, March 1999) A 1993 report by Stanford University demonstrates the isolation faced by women faculty members in male dominated departments (Report of the Provost's Committee on the Recruitment and Retention of Women Faculty, 1993). In that year there were no tenured women faculty members in applied earth science, geophysics, or applied physics departments. Women comprised 13 percent of the faculty in the biological sciences, 7 percent in chemistry and 6 percent in physics. When Stanford compared itself to 21 other elite educational institutions, the university ranked 19 in the total percentage of women faculty. Two technical schools, MIT and Cal Tech, ranked below them.

Women scientists in our sample are attracted to applied science and product development

In contrast to being pushed, two-thirds of the women we interviewed describe being more pulled to working in corporate science than in a university lab. They perceive industry as offering a faster-paced and more diverse career path. In particular, many women discuss their interest in applied science and working on product development. Others enjoy the economic stability of a corporate job and the freedom from grant writing to support their research projects. For the most part, these women learned about job opportunities from headhunters and corporate recruiters who interviewed on campus.

> *I was thinking I would get a post doc and do the academic route. And then I met a [corporate] recruiter at a conference and he told me about the variety of opportunities in industry, which I was really ignorant about.*
>
> (VP, Research & Development)

> *While I always loved science, I was never really intrigued with staying in a lab 12 hours a day . . . Combining consumer research and working with the manufacturing process to really design the intended product has a kind of magical appeal to me.*
>
> (VP, Research & Development)

> *I had this sense that I had gone into research in order to contribute. And I spent this large period of time writing grants, writing papers, making sure the Dean didn't take away my space and I had forgotten the mission . . . I remember thinking if I'm so smart why haven't I cured anybody of anything yet.*
>
> (Former professor, currently CEO, Bio-tech Company)

Profile in Science

One Woman's Career Path

Andrea Sanders, 49, has her own consulting firm. She was educated at MIT and Boston University, where she got her Ph.D. in 1975. From there she went straight to Texas for a job with Shell Oil that lasted 14 years. "When I started there," she says, "I was the first woman Ph.D. that Shell had hired in modern history. They didn't even have lab coats for women then, but now the opportunities for women in industry are pretty good. By the time I left Shell, about 40 percent of my department was female."

Dr. Sanders' career has included highly placed executive positions—most recently, a stint as vice president of research and development at Rhône-Poulenc North American Chemicals. She says that in industry, "we're seeing more women scientists, women are being taken seriously, there are more of us near the top." Still, she says, despite her belief that academia is less welcoming to women, the model science career is working in a lab for a university. Students don't see that if you like people you can translate your knowledge of the technical stuff into practical language and have a successful career in management."

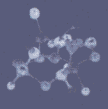
What concerns her is that "we haven't educated people about being as creative about your career as you are creative in your lab." That's why she devotes most of her time now to giving all-day seminars to students at colleges and high schools about how to shape their careers the way they want them to be. She and some other colleagues are looking into using the world wide web to match up women in science mentors with mentees.

Sanders left Shell, where she was a senior research scientist, in 1989 for a top executive job at a much smaller company. She attributes her success to "having the guts to leave a very stable company and take a risk with a small privately held company. I did it because I saw a glass ceiling at Shell. My style just didn't fit the Shell mold at the time."

Breakthrough experience: "One day a Shell customer in the Midwest asked, "How would you like to be our vice president of R&D?" They wanted someone to bring diversity to their company. I was perfect—I was from the East Coast, a female, the only Ph.D in the company, from a big company, and single (I was the only single executive).

"In one weekend I went from peon in an enormous company to head honcho in a small one. Suddenly my former boss's boss had to curry favor with me because I was the customer. It was a defining moment. When I met with my former boss's boss's boss—we were now equals—he said he wished he'd had the guts to do what I did."

Advice to young women pursuing a career in science: "Know thyself. Know your strengths and your weaknesses and be true to them. Find a company that values your strengths where you can find colleagues to help you overcome your weaknesses. Stick with your dreams. Persevere. Don't be afraid to open doors to see what's there. Walk through some of them. The roads less traveled are very exciting and challenging. If you like working in a laboratory by yourself trying to solve a piece of a puzzle, do that. If you like working with people, follow that road."



Only one respondent says she actively planned her corporate career and knew she wanted to be a vice president by a specific year. Everyone else describes a more spontaneous and flexible path in which they seized opportunities as they arose. These prospects could come from headhunters, professional contacts, or newspaper advertisements. The women scientists we interviewed do not have rigid ideas about what a successful career should look like. They know that opportunities in science and technology are always changing as whole new fields open up. Therefore, these women were attracted to companies that actively sought them out and that provided specific information about the opportunities and rewards associated with corporate careers.

Chapter 2: Women Scientists in Corporations Report Organizational Barriers

Absence of Female Role Models

Like other women professionals, women scientists are seriously under-represented among senior managers in American corporations. Catalyst's *1998 Census of Women Corporate Officers and Top Earners* found that only 11.2% of all corporate officers were women. This is even more true for women scientists. They have not attained a critical mass in the professional pipeline of companies that employ large numbers of scientists. Among the 40 corporate officers who held senior titles in research that year (VP, SVP, EVP) only two were women, both vice presidents of research and development (*Census of Women Corporate Officers and Top Earners,* Catalyst, 1998).

In the course of our interviews we asked women to name other female scientists whom they regard as role models. The majority of respondents could not think of anyone and state that they themselves always felt like pioneers. For several respondents, the only female role model who came to mind was Marie Curie.

Isolation

All of the women we interviewed were united by their minority status. Women engineers and scientists in both studies describe being the only woman among their peers during their academic training and professional careers. This sense of isolation is particularly pronounced among the women who earned their Ph.D.s in the 1950s and 1960s.

> *There were no other women in the whole four-story building of the Physics Institute.*
>
> (Vice President and Corporate Officer, Automotive)

> *My only problem is when I see another women in the room for a meeting or something I don't know what to do.*
>
> (General Manager, Aerospace Company)

Because women scientists are less numerous than other female professionals in corporations, they frequently describe a discomfort zone related to their interactions with male supervisors and colleagues. Most of the women interviewed, like the one quoted above, were accustomed to being the sole woman in the room both in their academic classes and in corporate meetings. However this minority status led many women to modify their behavior. As several women explain:

You have to be really forgiving and generous with the people you work with, more so than a man would be. This is because the band width—the amount of deviation from normative behavior—that a woman can have is very narrow, whereas a man has a very broad set of behaviors that he can display and still be OK.

(VP, Strategic Management)

There is a natural tendency for people to pick as their successors people that are very much like them. And so I do think it's a hurdle to overcome to have people reach a comfort level with your work and your results that sometimes men don't have to do.

(VP, Research & Development, Chemistry)

When it comes to promotion there are two barriers you have to climb over: one is the competency barrier and the other is the comfort barrier.

(VP, Research & Development, Bio-Statistics)

Catalyst's research and our advisory services work within companies has repeatedly confirmed that corporate culture has an enormous impact on women's advancement. As one of our focus group participants said, "there are things in a culture that are not written down, that are difficult to learn." And the unwritten rules of a company speak volumes about what it values. The classic example of this phenomenon is the IBM uniform of the 1950's, where the company expected everyone to dress conservatively to align with the corporation's traditional values. When IBM lost its market share to more innovative computer companies, their culture changed to embrace diversity in both clothes and thought. Women scientists still face pressures to conform to a male model of business. If male managers are comfortable working only with people who have similar backgrounds or experiences then women will be automatically excluded. Until companies expand their comfort zone with regard to women and minorities, diversity in management will remain an aspiration instead of a reality.

Catalyst's recent research shows that being in the minority in an organization frequently creates a double bind for women and people of color. Because they are few in number and different from the "traditional" workforce they are more visible and likely to receive more scrutiny than other employees (*Women of Color in Corporate Management*, forthcoming, 1999). While high visibility assignments are frequently associated with career advancement, high visibility in and of itself is not always associated with positive outcomes for women and people of color, who lack mentors/sponsors to coach and defend them when they make the inevitable mistakes.

Another consequence of women scientists not having achieved a critical mass in industry is their isolation from informal networks and channels of communication, and from other women scientists in their companies. This isolation was a driving force behind the creation of a Technical Women's Conference at Hewlett Packard in the early 1990s. The conference has been a way of introducing technical women within the company to each other, developing networks and mentoring relationships, providing information on career development strategies of more senior women scientists, profiling women scientists' contributions, and enlisting male senior managers' commitment to women scientists' advancement.

Profile in Science

What She's Learned

Judy Giordan is 45 years old, and married. She is VP and Corporate Director of Research and Development at International Flavors and Fragrances. Before that she was vp, worldwide research and development for Pepsi Cola. Before that she was Vice President of R&D at Henkel Corporation.

Giordan sees "what women bring to the party," meaning the business world, as "very straightforward. We are 51 percent of the consumer base on this little planet. Our purchasing power and decisions affect industry." According to Giordan, "most of the marketing and sales people do not always take that into account in some industries." So, she says, "women scientists in industry have to have the courage to stand up and be counted. You have to be constructive and positive."

Crucial lesson for women: Giordan has often been the lone woman in charge of a large operation in a male-dominated, traditional environment. She says that's taught her that, "sometimes all the fears, beliefs, hopes of everyone in the room, whether they loved their mommy or hated their grandma, get projected onto us. The greatest lesson I have learned is to realize it's their fears they're reflecting, not my inadequacy."

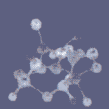
Critical or breakthrough experience: "I was the first woman hired to run a large operation at a very large company with a male-dominated, traditional environment. One day I was called into my supervisor's office and, in front of a man I supervised, told in graphic four-letter words that any problems in this organization were my fault. After that, I knew I had to move on . . . and I did."

Advice to young women interested in science as a career: "Mirror the behavior you'd like to see in others—if you want to see openness, generosity, and helpfulness, be that way yourself. Whether you're a technician or a senior person is irrelevant. If you act that way, you will notice change.

"Don't be an 'expecter,' be an achiever." Don't be disappointed if you find inequities. Don't expect the company to help you out, but be pleased when they do. The company believes it is there to make money. Work with your male colleagues to deal with gender issues."

Risk-averse Supervisors Who Fear Women Can't Cut It

Although more research is needed, our study suggests that women scientists' progress early in their careers is impeded, or at least slowed down, by their having to establish and re-establish their technical credibility. This is reportedly caused by stereotyping of women's abilities and the perception that promoting women is riskier than promoting men. As a result, women have to prove themselves repeatedly in order to move ahead.



It took a while for people to take me seriously. . .It took a long time to establish myself. I don't think that I was just granted expertise. Even if I had a Ph.D. it didn't matter. Whereas I don't feel that occurs with degreed males.

(Director, Pharmaceuticals)

Any time I ever got a promotion, I'd already been doing it for a couple of years before the promotion ever came through.

(Research Fellow, Pharmaceuticals)

"I really did feel as though I did not advance as quickly as [men] did in the very beginning. I think for the most part I've caught up, but I feel like I had a slower start and that was very frustrating.

(Product Design Leader)

When asked about specific career differences between men and woman, one participant discussed the importance of rotating assignments. Breadth of experience is critical to advancement, thus staying too long in any one position or with any one project can inhibit career mobility.

There is one difference, [men] have had more diverse assignments. I have had very deep assignments, but too long.

(Team Leader, Health Care)

Research shows that women typically spend more time in grade than their male peers in corporations. This delay at the start of a woman scientist's career can seriously hinder her advancement down the line. One woman said the only way she could counter the "competency barrier" was to produce results. And, as she put it, "results take time to accumulate." Another respondent had the following advice for corporations—"Instead of making women do it three times and men do it twice, reward the woman when she does it twice just like you would the man."

ANOTHER APPROACH

Stereotyping and Preconceptions

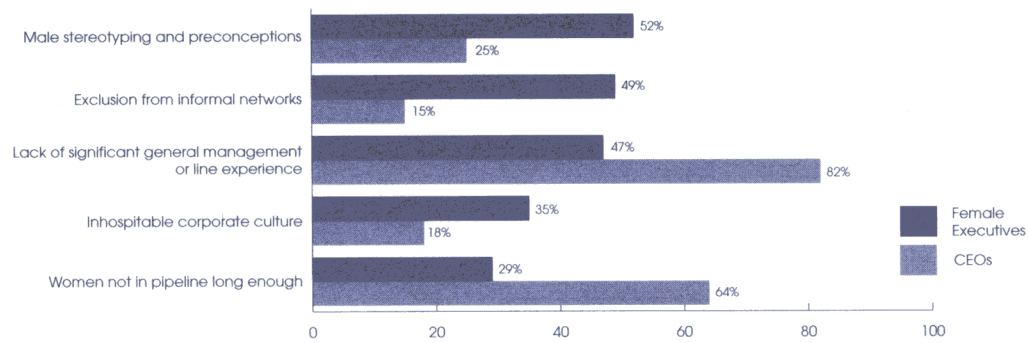
In Catalyst's 1996 study *Women in Corporate Leadership*, 52 percent of the executive women report that male stereotyping and preconceptions prevent women from advancing to corporate leadership.

"You must have the courage to pick up your bags and move on. Especially in situations where it is not your problem but the system's. Learning when to leave may be the hardest thing."

Judith Giordan, Vice President, International Flavors and Fragrances, Inc., Corporate Director of Research and Development, at the 1998 Academy of Science conference

Twenty-seven out of 30 women scientists in our study cite similar experiences and had to struggle against the perception that science was a male pursuit. The competencies and personal traits associated with successful careers in science—quantitative skills, objectivity, and a singular commitment to work—are generally viewed as male attributes. Traditional assumptions about women are just the opposite—it is said that they lack quantitative skills, are emotional, and place family obligations above work. Such assumptions can still hold sway; they work against women's acceptance in "hard" scientific disciplines. One respondent describes the situation the following way: "the woman is still a very unusual creature, particularly the woman in science."

Graph 2 : What Prevents Women From Advancing to Corporate Leadership?



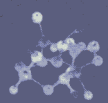
Source: Catalyst, *Women in Corporate Leadership: Progress and Prospects,* 1996

The five "pioneer women" in our sample had more blatant experiences with men questioning their right to practice science than did their younger colleagues. For instance, one woman who completed her Ph.D. in physics in the 1960s reported in an interview that men automatically assumed she was husband-hunting when she applied for a job. Several women talk about not being taken seriously because they were attractive and men automatically assumed they were dumb. Some even had to justify why women would want to work at all.

> *It was a point in time when men didn't understand why women would even want to come into the workplace. To them it was a foreign concept. And their thinking was the only reason women would take a job like this was to meet a husband.*
>
> (VP, Research & Development)

Since the first generation of pioneers was so small, the next wave still faced difficulties early in their careers. One woman recalls being tested by her male colleagues when she worked in the auto industry.

> *They took me on a test drive and said try out these anti-skid brakes . . . I go racing up to this obstacle and hit the brakes, which were supposed to have been anti-lock. . .and they had disabled them. So I went into this skid and went spinning round and round. They did it to test my reaction.*
>
> (Director, Materials)



Although more rare, some women describe episodes of sexual harassment.

> *When I was working in a plant I had a guy urinate on me. I mean I had some awful stuff happen but I think what got me through was a sense of humor. . . And I had to form some allies.*
>
> (Technical Manager)

> *One of the nicer, if you will, sexual harassment comments I ran into was, "if your voice was just an octave lower, and we could close our eyes, you could be one of the guys and then you would fit in great.*
>
> (VP, Research & Development)

A hopeful note. These incidents typically took place early in a woman's career when she was younger and trying to establish credibility. Almost all of the women we interviewed (26 out of 30) say they are optimistic about the future of women in science and have witnessed enormous change for the better in the workplace over the last three decades. The stereotypes and preconceptions they are addressing now are different and often come in the form of subtle questioning of a woman's abilities.

Differences of Style

Several women also mentioned how different styles of communication between men and women can affect how one's ideas are received in the corporation. Deborah Tannen has conducted extensive research in this area and her book *Talking 9-5* supports this finding. Corporations tend to reward an assertive style of speaking and often dismiss language that is less certain. Although men and women can exhibit a wide range of communication styles, an authoritative manner is associated with men. Catalyst researchers and others have found that when women exhibit an assertive style they are then labeled aggressive by male colleagues and supervisors.

> *Men in general just present things more forcefully—'Well we've seen this and this indicates this and so on,'—and then it's off and running. I think women will say 'well we think it might be this.'*
>
> (Research Chemist, Chemical Company)

> *Corporate cultures do expect aggressiveness, but then don't accept it from women . . .women are sort of caught in this double bind that they can't ever win.*
>
> (President, Business Unit)

Stereotypes about how women should act and communicate greatly inhibit their ability to contribute to the corporation. Our respondents note that women have to spend extra time and energy debunking preconceptions and making their colleagues comfortable with their style. Sometimes women themselves internalize gender stereotypes. One woman scientist we interviewed attributes her success to thinking like a man.

> *Basically I think a lot like a man, and have a lot of personality traits that probably some people would equate as male, you know analytical thinking and logical actions . . . as opposed to the emotional.*
>
> (Planning Manager, Chemical Company)

Exclusion from Informal Networks

Another aspect of the comfort equation is exclusion from informal networks. In Catalyst's 1996 study, 49 percent of the executive women surveyed cited this factor as a major barrier to women's advancement. Women scientists agree.

> *I'm not invited to the basketball games. Yet I was an all-city basketball player in high school and have played for years. . . Then once I was in a meeting where we had a break. I came back and they (the men) had made the decision in the bathroom. We all sat down and the decision was made. And I said, excuse me, I thought we were just discussing that. I was flat out told, well we just made that decision at break.*
>
> (Director, Manufacturing Company)

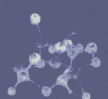
> *I think that there are informal relationships that women have with women and men have with men that do facilitate communication . . . there's no question that there is a deficit there for women in business.*
>
> (SVP, Worldwide Scientific Affairs)

Golf was mentioned by several respondents as an activity that excluded women, particularly those who didn't want to give up their weekends because of family responsibilities. The women we interviewed are divided over whether or not they should take up golf in order to advance their careers. Several women did take lessons, whereas others refused because they equated this with selling out.

The choice to play the game was very personal. One woman decided it was important to her career to play ice hockey with the research and development team. This required enormous sacrifice not only because she was not an athlete but also because the team played at 3:00 am on Saturday mornings—the only hour they could reserve ice time. In retrospect, she says she established a reputation for being gutsy and formed relationships that helped her throughout her tenure with that company.

Lack of Mentoring

Nearly all of the women scientists we interviewed recognize the importance of mentors and sponsors to their advancement. However, companies cannot assume that women will find mentors through the same informal mechanisms that men do. As one woman explains:



> *I think that women sometimes don't get the same type of mentoring that men do. . . There is a natural tendency for people to pick as their successors people that are very much like them. A lot of senior men feel very comfortable with men who went to the same school or played on the same football team or belonged to the same fraternity or look like them or act like them.*
>
> (VP, Research & Development)

> *I would say that in the first two-thirds of my career there was minimal mentoring and it was very disappointing.*
>
> (Technical Project Manager, Materials Company)

This barrier is critical, particularly when women scientists want to move into management roles. Most of the women we interviewed work in companies where the technical track takes one only so far and moving into a management role is the path to advancement. Women particularly need guidance and mentoring when they go through the transition from bench scientist to manager. Management requires different skills. It can be difficult to return to a pure research role once one has made the switch. The women recognize that each subsequent move on the managerial track, especially lateral moves, could reduce their chances to return to the core activity for which scientists are trained.

Among women in this study, a successful transition to management was often associated with having a strong mentor—someone, usually a male, who assured them that they could do the job and that he would support them in their new role. Frequently, the women themselves could not envision how a recommended career move would fit into their short or long-term goals. One respondent says she liked being an individual contributor and had assumed that she would progress in the technical track of her company. When her mentor advised her to try management, she initially resisted. She thought she would be frustrated trying to achieve things through other people. He acknowledged her concern, but showed her how she could accomplish so much more through a team of ten or twenty than she ever could alone. Because of his advice, she took the leap and never looked back as she advanced up the management ranks of a major chemical company.

Lack of Line or General Management Experience

Another frequently cited barrier to advancement is lack of line experience. Line roles involve direct profit and loss responsibility in contrast to staff positions which support the line. Typically the sales and manufacturing functions of a corporation will be considered line areas, while research and development are staff functions.

In most corporations Research and Development is considered a staff function because it is a cost rather than a profit center. Managers invest the company's resources in future products and are responsible for managing expenses rather than generating direct profits. Therefore, to become the vice president of Research and Development a woman would not necessarily need general management experience. However, if she wants to advance further in the corporation, line experience is critical.

Catalyst's 1992 study, *On the Line: Women's Career Advancement*, found that women are encouraged to enter staff roles and find it difficult to obtain line responsibility. Executive women often encounter barriers that restrict lateral mobility—glass walls—before they even encounter the glass ceiling. Line assignments are important developmental opportunities that significantly affect future advancement.

Often people think of line positions as those that are central to the core operation of the business. The importance of scientific discovery to the business clearly varies by industry. For instance, research and development is more critical to a pharmaceutical company than a packaged goods firm. Manufacturing and sales, however, would always be considered line functions in any industry because they generate profit directly.

One women scientist describes the dilemma in the following way:

> *There's one thing I think women in sciences and technology kind of suffer from. Once we get in jobs and we demonstrate clearly we can do what is required of us it's hard to see us beyond that. I think I have a really good business head and I run a technical organization with business conditions in mind. But for me to move into a business role . . . more general management than technology management—that's a huge leap for organizations.*
>
> (Director, Manufacturing Company)

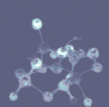
Several women we interviewed expressed interest in running a business unit. These women have gone out of their way to learn the business side of the company in addition to their technical area of expertise. One woman has earned her MBA and two others have completed executive MBA programs to demonstrate their willingness to take on profit and loss roles. Several other women have taken finance and management courses to complement their scientific training.

On the other hand, one-third of the respondents expressly say they are committed to the science side of the business and are not interested in line assignments even if they were offered.

> *I didn't really want to do that—because I'd always loved research and development and I didn't really want to go off and do sales and manufacturing and that kind of thing.*
>
> (VP, Research & Development)

> *I told [my boss] I was as close to the customer as I wanted to be, I hate salesmen and I hate dealing with salesmen.*
>
> (Planning Manager, Chemical Company)

One woman describes moving from research and development to her first line position at headquarters. She held the position for 18 months and realized that she really loved R&D and did not want to conduct profit forecasts forever. She requested a transfer back to research. Fortunately her supervisor was very supportive of that decision. Looking back she says the experience was very valuable and allowed her to understand the big picture of the business and



how research fits into that vision. Most important, her company provided a safety net for her to venture out of familiar territory without undue risk to her career.

Whether or not they personally want to assume profit and loss responsibilities, many of the women we interviewed understand that lack of line experience is a barrier to women's advancement generally.

> *I think women don't get enough line management experience. I think that companies still don't feel comfortable turning over the reins of a billion-dollar profit and loss project to a woman.*
>
> (VP, Technology Management, Corporate Officer)

> *[Women] can move up in the corporate R&D area . . . but running a major unit and supervising 3,000 employees who are manufacturing something—it's still hard to break into that world.*
>
> (General Manager, Aerospace Company)

In Catalyst's 1996 survey of women executives we interviewed male CEOs of Fortune 1000 companies to determine what they thought were the key barriers to women's advancement in business (Graph 2, p.20). Eighty-two percent cited lack of significant general management or line experience. Many companies rotate their high potential employees through line roles in order to develop them for future leadership. Corporations need to ensure that talented women in technical fields are given similar opportunities to broaden their business experience.

Work/Life Balance

As mentioned previously, two-thirds of the women in this study have children, and nearly all are married (28 of 30).

Though they struggled to keep up with the fast-paced environment in which they worked, these women scientists managed to remain in their companies and have families. For the women pioneers in this study, this required a great deal of creative planning and tenacity because they had children during a time when companies did not have work/life initiatives. The women who followed in their footsteps had access to formal pregnancy leaves and in some cases to alternative work arrangements. However, only one woman we interviewed had taken advantage of her company's formal flexibility program. Several respondents were concerned that they could not pursue their science careers and take family leave at the same time.

Respondents also talked about lab experiments that required them to be at work regularly, for long hours at a time and frequently at unusual hours. As one woman notes, "if you're an experimental scientist, you really need to be in a laboratory." These women also talk about being very involved in the content of their work and not interested in taking time off. One woman brought her six-week-old son with her to a scientific presentation in Europe. When asked if she felt pressured to make that decision, she says she never thought about doing anything else.

However, other women scientists feel they face the same struggles as women managers generally. These women no longer conducted experiments themselves but rather managed scientific work. Instead of being driven by an experiment's timetable they are driven by workload. One general manager at an aerospace company described the difference this way:

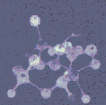
> *People in research have to be doing research ten, 12 hours a day. If you're in management—I could come home at six o'clock and always be there for dinner. After the children went to bed or were doing their homework, I could do some work at home.*
>
> (General Manager, Aerospace Company)

In addition to the physical constraints of workload, several women brought up cultural barriers to work/life balance. One woman describes keeping her children invisible at work because she wanted to be considered a serious-minded, dedicated scientist. She refused to put pictures of her children on her desk because she feared male colleagues would question both her commitment to work and her commitment to motherhood. Several women talked about how difficult it was to be pregnant in a male-dominated office. One woman said she dealt with this issue by never telling her colleagues that she was pregnant. She wore large lab coats and they never noticed until she went on leave.

> *I was a section head after three years, which was pretty fast. And then I got pregnant. My boss freaked out. He did not have any idea what to do about this.*
>
> (Focus group participant)

> *And the time you have kids is a time that really harms your advancement. I saw it over and over again.*
>
> (Team Leader, Monsanto Company)

Only one woman we interviewed had used flexible work arrangements and for many, such programs simply did not exist. The most frequently used policy was maternity leave. However for some women corporate leave policies did not create more flexibility—they imposed new rules. One woman scientist reported that her company forced her to take a three-month unpaid leave, even though she wanted to return to work after three weeks. Another said she gave the wrong due date to human resources, so she could work up until the end of her pregnancy. Other women were so concerned that taking time off would impede their advancement, they chose to return earlier than what was formally allowed.



Nearly half of the married women reported that having a supportive husband was critical to their ability to balance their work and personal responsibilities. Several women reported that their husbands had relocated for their careers. Others depended on their spouses to share housework and child care responsibilities. Two women specifically mentioned that their former husbands had not been encouraging of their work and that this was a large factor in their subsequent divorces. Both happily remarried men who had flexible careers and were willing to make accommodations for their wives' professions.

> *I had a very supportive husband, which I think is key. It enabled me to continue working and fortunately we found good help which simplified our lives.*
>
> (General Manager, Aerospace Company)

Respondents spoke of juggling multiple commitments and were very clear about the trade-offs they were willing to make. One woman had a commuter marriage to accommodate both her and her husband's careers. This arrangement allowed her to dedicate one hundred percent of her time to work during the week and one hundred percent to her husband on weekends. Other respondents chose not to have children or waited until their careers were well established before they started families.

> *I chose not to have children. I knew that I could not be everything to all people. And I did not want to constantly feel miserable and guilty every morning. . . That's how I manage my balance.*
>
> (VP, Research & Development)

> *I travel differently from other people. I do not go the night before if I can go and get a 6:30am flight down to Washington in the morning instead. I come home on the "red-eye". . . I minimize my time away.*
>
> (Director, Pharmaceuticals)

And yet despite these obstacles, many women did find ways to juggle multiple obligations. Their descriptions of how they integrated and coordinated work/life responsibilities and interests by delegating, prioritizing, and self-assessment suggest that the skills required to manage effectively in different domains were mutually reinforcing rather than mutually exclusive.

Catalyst's 1996 survey of executive women found that a majority do manage to combine career and family. Seventy-two percent of those respondents were married and sixty-four percent had children. Nevertheless the myth persists that women have to give up marriage and motherhood in order to succeed in the executive ranks of corporations. The women in both studies achieved balance largely through their own efforts, using the management skills, sound judgment, and ability to prioritize that characterized their success in the workplace. It is clear, however, that companies could do more to offer both formal and informal flexibility to women professionals and to ensure that use of such alternative arrangements do not negatively impact their career outcomes.

Chapter 3: Successful Strategies of Women Scientists in Industry

Each woman Catalyst interviewed shared a story about how she created her own unique career. When examined together, clear themes emerge, spanning each of the individual narratives. Although numerous success strategies were mentioned, the most frequently cited factors include cultivating a technical expertise, developing a successful style, obtaining stretch assignments, having mentors, and networking both inside and outside the company. It is important to note that these strategies also represent challenges for women scientists as they seek to overcome the barriers outlined in the previous chapter.

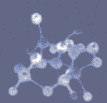
Technical Expertise

The most frequently cited individual strategy for success in Catalyst's 1996 study of women executives is consistently exceeding performance expectations. Women scientists agree and often spend many hours in the lab or in the office proving themselves. A critical component of performance in research and development is developing technical expertise. And the first step in demonstrating one's expertise is obtaining the right credentials. Several women specifically mention how important a Ph.D. is to success in their chosen field. The women we interviewed are enthusiastic about their education and have spent many years honing their skills as scientists. While the majority of our respondents began their industrial careers with a Ph.D., a small number returned to school only after they had worked for several years.

> *The Ph.D. is a license to practice. A Ph.D. opens doors for anyone, whether you're male or female, in science.*
>
> (VP, Research & Development)

> *The experience most critical to my advancement was having a degree from MIT.*
>
> (General Manager, Aerospace)

Once they accept positions in industry, woman scientists have to learn to apply their often abstract academic skills to pragmatic business problems. This is the first hurdle both male and female scientists must overcome in demonstrating their ability to perform as bench scientists in industry. More than half (17) of the women scientists interviewed for this research report that developing their technical *reputation* was critical to their career success. However, women scientists report that, first, they had to prove their *preparation* to carry out basic technical procedures which their male peers were automatically assumed to have mastered. This finding is in keeping with other research that shows that many male managers' stereotyping of women professionals' abilities and suitability for "non-traditional" careers results in a reluctance to entrust women with key or stretch assignments and a slower pace of advancement for women at the beginning of their careers in companies (*On the Line: Women's Career Advancement,* Catalyst, 1992).



There are many concrete measures of technical excellence, including the number of patents or publications one produces. These early achievements can follow scientists throughout their careers. One woman who is currently in management says she is still recognized for a process she patented over 15 years ago. That scientific credibility early in her career helped her manage technical staff more effectively, even when she was no longer working at the bench.

Several respondents also talk about the importance of keeping current on technical issues. Although managers often don't need the detail or depth of knowledge that bench scientists do, they have to grasp the implications of innovation. As one vice president of R&D stresses, "you have to stay a technical leader, you can't be a technical manager." Such leadership involves reading relevant journals, joining scientific associations, and attending technical conferences.

For women, having a clear technical niche can also counter potential backlash. Catalyst and others have found that as companies institute policies to improve women's advancement they often face opposition from male employees who feel threatened or discriminated against. Individual women experience this when colleagues question their promotions or assume that they benefited from affirmative action. One vice president brought this phenomenon up specifically; she says her male peers never begrudged her a promotion because it was clear that her technical skills fulfilled a need that no one else could provide.

In contrast to the technical specialists, six respondents offer an opposite strategy for success. They specifically raise the point that being a technical generalist is important to their managerial success. Often scientific managers are asked to lead projects that are beyond their technical experience. In such cases, management skills compensate for the lack of knowledge. One woman describes how her strongest skill was dealing with customers. The chemical company she worked for did not value that attribute in its technical staff, so she left and became the vice president for R&D for a smaller business that prized that skill. Other women scientists talk about their abilities to think strategically about scientific issues, to communicate technical concepts to non-technical colleagues, and to manage cross-functional teams effectively. These talents cut across technical specialities and allow the women we interviewed to function in a wider array of corporate roles.

Finally, a significant number of women acknowledge that their scientific training did not prepare them for the business side of their jobs. Many respondents sought out courses in accounting and management to complement their technical education. One woman even earned her MBA and feels that the degree, in combination with her Ph.D. in pharmacology, gave her a competitive edge that her research colleagues don't have. In a different vein, two other women managers completed executive MBA programs to improve their understanding of the business climate in which they operate.

Change of Style

As noted, prior Catalyst research has found that a critical success strategy for women is developing a style with which male managers are comfortable. Since women executives are most often in the minority in business settings, it falls to them to adjust their style to fit in with the male majority. The women scientists in our study also talk about this phenomenon. They describe the importance of having a positive attitude and many say that this outlook came naturally to them. Using phrases like "maybe I am a Pollyanna," these women tend to see the glass as half full instead of half empty. In fact, certain respondents feel very strongly that women with negative attitudes were doomed to failure.

> *I think sometimes women can get sidetracked with anger. I don't know if that is conscious or unconscious, but anger can seep in around the sides, where people feel like it's not fair they have to go one step further, like they have to say things a couple of times during a meeting before people will credit them with having said it.*
>
> (VP, Research & Development)

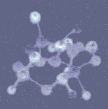
> *I think it was important that I didn't carry a chip on my shoulder as a woman. I have seen women who do that and it's just awful.*
>
> (VP, Automotive)

> *If you want to look around and say, yes women are downtrodden. . .you can put yourself in a very negative state of mind. I would prefer to look at it the other way. The cup is half full.*
>
> (VP, Research & Development)

One aspect of a successful style is minimizing one's difference from men. In fact, a few of the woman pioneers talk about trying to make their male colleagues forget that they were women at all. One senior woman in the car industry said a victorious moment occurred when the Chairman cursed in front of her and didn't apologize.

Although they desire invisibility, few women scientists are able to achieve it for very long. Instead, most choose to ignore the obstacles in their way. These women are pragmatic; they accept the fact that they faced some barriers as pioneers in their fields. But they also believe strongly in the power of the individual to conquer adversity.

> *I'm not even aware of problems that I've had. I have a friend who says that I tend to ignore things like that and I tell her that she is too sensitive and she says I'm too teflon-coated.*
>
> (Executive Manager, Chemicals)



> *I think I just ignored it for the most part, to the extent that you could. I mean, you knew that there was some hostile environment out there. But just developing survival skills and ignoring as much of it as possible was what worked best.*
>
> (VP, Research & Development)

> *I think the answer is always taking charge and being responsible for your destiny. Never whining, never complaining that there's a glass ceiling, just getting through it.*
>
> (CEO, Bio-tech)

Finally, several women discuss the need to pick one's battles. These scientists were well aware that they alone could not change the entire corporation and because battles take energy they focused on fighting the ones that really mattered. And when women did speak out they used humor and tact to convey their point of view. But the main focus was always on producing excellent results. Style was a means to communicate results in such a way that they could be heard.

Stretch Assignments

Despite their self-confidence and belief in individualism, women scientists recognize that career success requires help from the corporation. All of the women we interviewed discuss the importance of high profile and stretch assignments. Many different kinds of assignments could fall in this category and include opportunities to move between sectors, functional areas, and product lines. These are broadening experiences that provide exposure to other aspects of the business and to new people within the organization. Another hallmark of stretch assignments is that they are risky and offer an opportunity to demonstrate abilities in difficult situations—like launching a new product or turning around a failing unit. Some of our respondents also mention stretch projects that involved moving abroad or working on international projects at home. In such cases, globalization was important to the future of the business and international experience was critical to future advancement.

> *I think if people aren't willing to give you interesting assignments, then you can't really prove yourself.*
>
> (VP, Research & Development)

> *I was fortunate because I did have some very good people I worked for over the years. So while I was also driven, I think that they stretched me in ways I probably didn't believe I could do myself.*
>
> (VP, Clinical Operations)

The most significant aspect of all these assignments is that they provide opportunities for learning and career growth. A fundamental part of learning is being open to risk-taking. A majority of our respondents mention moments when they stepped out of their comfortable niche and tried something new. Often this strategy ran counter to their scientific training which encouraged them to focus deeply and often narrowly on one topic. However, in the corporate world women scientists need to develop broader skills in order to manage projects that may be outside of their

field of technical specialization. Although stretch assignments could be frightening, many of the women we interviewed identify those experiences as defining moments in their careers.

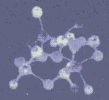
> *I took a flying leap of faith in that position. . . It was really quite a dramatic change for me, because for the first time it put me, a statistician mathematician, in a position where all of the people who reported to me had either chemistry or chemical engineering degrees. I was no longer doing math and statistics for a living, I was doing product design.*
>
> (VP, Research & Development)

In another example, a vice president for environmental & technology management accepted a corporate assignment for the chairman of the board which took her off the fast track in research and development for a year. Several of her scientific colleagues thought she was crazy and that such a move would permanently damage her career. She took the risk because she wanted the chairman to "think of me not just as a scientist, but also as a businessperson dealing with an issue that was very policy-oriented, that was very strategic." It turned out to be an excellent career move that gave her high-level visibility and led directly to a promotion when the assignment was completed. And it should be noted that the corporation took a risk with her as well. The chairman was offering a scientist an opportunity to demonstrate her business skills in front of a very senior-level group of decision makers. In this case the risk was successful, but if it turned out not to be a good match there should be a safety net where this woman could have returned to research without damaging her career. We don't know if this corporation had such a mechanism at that time but companies that successfully foster risk-taking often do.

Clearly career development is a two-way street. Women scientists have to demonstrate that they are ready for risk, while companies have to offer women stretch assignments so they can prove their skills. Requesting risky assignments is not always easy. One director in manufacturing expresses her concern that the young women in her company do not step forward enough and ask for more responsibilities. Even though the women scientists we interviewed could not fully control the assignments they were given, they were successful because they developed reputations for being risk-takers.

Mentoring

Over half of the women we interviewed acknowledge being helped up the corporate ladder. The importance of mentoring consistently surfaces in Catalyst's research and advisory work with corporations (for example, *Women in Corporate Leadership: Progress and Prospects,* Catalyst, 1996 and *Women of Color in Corporate Management: Dynamics of Career Advancement,* Catalyst, 1998). Traditionally, mentoring is viewed as an informal relationship where a senior executive teaches a more junior colleague the unwritten rules of business. Mentors provide guidance and mentees are able to ask questions in a safe environment. With this model, men tend to mentor other males and the relationship is dependent on chemistry between the two partners. As we mentioned earlier if women have to overcome a comfort barrier with their male colleagues it is unlikely that they will benefit from such instant rapport.



As a result, companies have begun to institute formal mentoring programs where both male and female mentees are matched with senior mentors. Whether or not mentoring is formal or informal it can greatly assist career advancement. All of the women in our study found mentors informally and almost all of the mentors were men. Some forged close relationships with their supervisors while others gained support outside the corporation. When asked what a mentor provided, the most frequently cited contribution was helping the mentee understand and navigate corporate politics.

> *He mentored me in, I would say, political nuances. Which is not really where I care to play, but politics is a way of getting things done. . . often when we're trained as scientists, we look at things from logic and facts but we have to realize that there's a whole population out there that doesn't make decisions based on facts and logic.*
>
> (Executive Manager, Research & Development)

> *I used colleagues at other companies as my out-of-house mentors. And they were really phenomenal and I learned how much I could learn by just asking for help.*
>
> (VP, Research & Development)

Another important finding is that women scientists need different kinds of mentoring at different points in their careers. One woman described it this way—early in her career she needed and found, as she put it, a mentor who "turned on the lights *for* her" by helping her understand the politics of the organization. Later in her career she found a mentor who turned the lights *on* her, i.e. gave her visibility to demonstrate her capabilities and contributions. In that case her mentor acted as a sponsor. While sponsors can also be mentors, not all mentors are in the position to be sponsors. A sponsor is a person in a position of authority who can promote your advancement in the company and intercede on your behalf to resolve career problems. A sponsor literally has the power to pull you up through the organization, positioning you to compete for significant leadership roles. One woman provided the following example.

> *I had to fight to keep one job. My boss really helped me do that. While others around him were saying, we need to put somebody in there who's more experienced, he said no, come get to know her, see what she can do. He gave me the chance to interact with higher company management so that they could see the way I thought and how I approached things. He fought to keep me in that position.*
>
> (VP, Research & Development)

Networking

Finally, networking was cited as a critical success strategy by the women scientists in this study. The "pioneers" among our respondents had their greatest success with external networking since there were so few other women in their companies and it was difficult to break into male networks. Nonetheless, they, along with younger women scientists, acknowledge the importance of gaining visibility with senior scientists and executives in their organizations, finding mentors,

and gaining access to networks. A critical aspect of such networking is generating internal publicity for one's own projects. Publicly discussing their own accomplishments is essential to being considered for job opportunities. Several women admitted that they aren't always comfortable tooting their own horn. This is consistent with other Catalyst research which has found that women tend to expect recognition when they produce results and underestimate the need for self-promotion. Again this is an area where mentors are particularly valuable and can give women advice on how to position their achievements effectively. There is hope that future cohorts of women scientists (and other women professionals in corporations) will have more opportunities than pioneering women scientists had to network with male colleagues in informal as well as formal business settings.

Several women also mention that the research they work on is proprietary so they cannot present at external conferences or meetings. In such cases internal contacts are much more important to career advancement.

> *I'm more focused on the company and the people who work for me than on being recognized on the outside as a specialist in this or a specialist in that.*
> (VP, Pharmaceuticals)

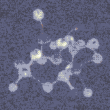
> *I think one of the strongest things that I ever did was just network. I am really good at calling people in this company who I don't know to ask them to lunch.*
> (Director, Manufacturing)

Nevertheless, one way to develop an internal reputation is to network externally. The majority of our respondents use this strategy to enhance their career mobility. Most of the women we interviewed are active in professional associations and industry groups. These organizations provide leadership opportunities in the form of elected positions as well as seminars to keep scientists informed about the state of their technical field. Women on the technical track with whom we spoke are regular presenters at conferences and serve on panels where they can discuss their scientific achievements among peers.

> *Networking outside of your company . . . gives a certain amount of prestige to your position within the company.*
> (VP, Research & Development)

> *I was lucky enough to get some phone calls that changed my life in many different ways. But in looking at it I did position myself for those phone calls. In other words they didn't just happen. And that was through my active involvement in various trade associations, as opposed to something like the American Chemical Society, which would be a technical or professional association.*
> (VP, Research & Development)

Networking is also a developmental opportunity. One woman says her boss encouraged her to attend association meetings in his stead so that she would cultivate business contacts of her own. That turned out to be very valuable when years later she wanted to leave that company and look for another job. Most women cited job contacts as the most visible benefit of external networking.



All of the pioneer women we interviewed served in some capacity on boards and industry committees. Since there were so few (or no) women at their level in their own company, they were frequently motivated to join outside groups for a sense of community rather than as a conscious advancement strategy. Association conferences were often cited as the only forums for women scientists to meet one another and talk about their experiences in industry, academia, and government. In fact, many women realized the benefits of their participation in such groups only much later in their careers.

> *The fact that I had been pretty active in professional organizations turned out to be much more of a factor and much more of a help than I would ever have suspected.*
>
> (SVP, Technology)

Another critical aspect of networking, both internally and externally, is developing communications skills. Several respondents believe that technical women have the edge over their male peers in this area. By effectively communicating technical concepts to their non-technical colleagues, many women feel they have more opportunities to demonstrate leadership within the corporation.

> *Scientists don't have great people skills and I think engineers are even more guilty of that than chemists. . . women will acknowledge the people element more.*
>
> (Manager, Chemicals)

> *It is not enough that you do good science. You've got to tell people about it. You've got to sell it. Oral communications is critical and our graduate schools don't really emphasize that.*
>
> (Technical Director, Materials)

Our respondents repeatedly debunk the myth that scientists can toil in isolation. In today's corporate environment scientists must participate in multi-disciplinary and cross-functional teams. Scientists in research and development have to be able to communicate with their colleagues in manufacturing, sales, and marketing in order to bring a product to market. One woman says she felt many "diversity" conflicts in corporations were not between men and women but between departments. Each functional area brings a different perspective to a business problem and successful companies harness the talent of the whole team to generate the best solutions.

> *"In my experience, women have tended to be able to deal with diverse ways of thinking by being more conciliatory, working to build teams, and having great interpersonal skills. Therefore I think that women can contribute a tremendous amount in a team-based management environment and that's where women scientists can show real leadership."*
>
> Andrea Sanders, at the 1998 Academy of Science conference

The Future

When asked about the future of women scientists' advancement in corporations, the majority (26 out of 30) of our respondents are optimistic. These women have witnessed enormous positive change in the last three decades. They believe the trend will continue. There is consensus that this is an exciting time to be a scientist and that women have more options in industry than they ever had before. As a result, some women doubt their ability to give advice to younger colleagues because business and science has changed so much from when they first started out.

Optimists

I am very optimistic. And I think that my experiences are not relevant to women in the company today, interestingly enough. My experiences do not help them with what they face because my culture was so different.

(VP, Research & Development)

This company has drastically changed, because when I first came here it was still that condescending attitude from men.. . We were told not to wear pants.

(Focus group participant)

People don't stand for it anymore. I felt very comfortable when I was asked, are you planning to start a family, to say, it's none of your business.

(Focus group participant)

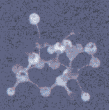
Pessimist

We are at a period of time where people have perhaps relaxed a little bit and think everything is fine. And I think there is such a thing as the glass ceiling, if you look at the top corporate officers. It's important that women continue to take charge of their careers and to make sure that their companies are providing paths for them.

(Technical Manager, Telecommunications)

The four women who are pessimistic about the future feel change has not come quickly enough and point to the paucity of women following them up the corporate ladder. One woman is particularly concerned about a growing complacency.

One major piece of advice that emerges over and over again is the importance of self-confidence. One of our pioneers in the aerospace industry talks about how she had mentored several younger women who had all the right skills, but ultimately lacked the confidence to aspire to the truly senior ranks. She attributes her own confidence in the 1960s to her family. Other women report that they have achieved far more in their careers than they had ever dreamed of when they started out. Their wish for the next generation is that women have higher expectations and embrace the ambition that is necessary to succeed in corporations.



Profile in Science

A Science Pioneer

Frances Allen, 66, is senior technical consultant to IBM's Research Solutions and Services Vice President. In 1989, she was named a Fellow of IBM, the first woman to achieve that position. Allen began at IBM in 1957, shortly after completing her education. Teaching was her first aim—she trained at what is now SUNY Albany to become a math teacher, started out that way and "loved it." But she needed a graduate degree, which she got at the University of Michigan. Then she needed to pay off the loans she'd taken out to pay for her education, so she got a job at IBM, then at the beginnings of the computer revolution.

Computer science, her field, is just fifty years old, and she's been around for most of its history. At the beginning, there was no apparent discrimination on the basis of gender, she recalls. But later, as the field became more attractive and more men entered it, getting ahead got a little more difficult for women. The discipline has "made a lot of progress," she says, in the sense that we're all using computers that never existed before but, "computers are not very user-friendly. Many of the systems we have—DOS, etc—are monuments to the male egos that created them. Our field needs women."

When she began, "I didn't think of it as a career, just a good job," she recalls. "It was a lot of fun, I enjoyed the people, there were a lot of challenges." In the meantime, she married, raised two stepdaughters, and managed to balance her work and her family. Now, 42 years later, she specializes in high performance computers.

From her vantage point of 40 years in the field, she sees this as "an extraordinarily exciting time in science. The computing field is just the beginning," she says. "It's happening in biology and other fields as well. This is an exciting period in science and women are going to play a great part in it."

Advice to young women: Women must have complete confidence in themselves. Believe that you're dead right and pursue your science and your goals with that inner assurance.

This study suggests that the climate in corporate science has greatly improved over the last three decades. But impediments do remain. As we've reported earlier in this study, these include male stereotypes about women's technical abilities, exclusion from informal networks, lack of mentoring, lack of line experience and difficulties balancing work and personal life. These systematic obstacles need to be addressed if women are to advance to the highest levels of corporate leadership and their companies are to profit from women's excellence.

Chapter 4: Recommendations

What Individual Women Can Do

Keep your options open as you pursue your degree. Recognize that women scientists in industry pursue many of the same goals as do research scientists in academia—to improve the health and well-being of people around the world and enhance their quality of life. Challenge the idea that working in industry would be "selling out" by learning about the variety of products/services you might work on in an industry setting.

Conduct information interviews with women scientists working in industry. Women scientists interviewed for this study uniformly expressed concern about improving opportunities for other women and welcome your questions about the opportunities and challenges they have faced working in industry.

Consider applying for an internship in a corporation. Companies routinely use internships as a way to get to know potential candidates for permanent professional positions. In some cases, financial support is available to assist promising candidates in completing their degrees. In other cases, advanced students have found they don't need a Ph.D. or post-doctorate studies to pursue their research interests in a corporation.

When considering companies to work for, check out these areas:

- What is the representation of women scientists in the company? Are they doing the kind of work in which you are interested? Do some hold leadership roles?

- What is the corporate culture/work environment like? What are the development opportunities for scientists on the technical side? In management? How flexible is the culture? How have women scientists with children fared? Ask to talk to women scientist who work there.

- Recognize your value. Companies are competing to recruit the best and brightest women. As a woman scientist, you are in a position of strength to negotiate starting salary and terms and conditions of employment.

- Discuss development opportunities from the very beginning. What kinds of assignments can you expect? What is the typical career progression on the technical track—from bench scientist to management roles? How long should you expect to stay in grade in your first and subsequent assignments?

Once you take a job:

Seek mentors and take advantage of opportunities to network outside of your functional area and work unit. Take the initiative.

Look for opportunities to gain visibility for your work. Document your accomplishments in writing. Volunteer for committees and other assignments that provide opportunities to network outside of your work unit.

Ask for feedback. Recognize that male managers, especially scientists, have limited experience working with women as professional colleagues. Maintain a sense of humor. Recognize that in fields where women have not yet attained a critical mass, it falls to women to reduce the "discomfort level" of male co-workers and supervisors.

Performance is bottom line but it is not enough. Like it or not, organizational savvy is a requirement for promotion in almost all organizations. Find a coach. Better yet, become valuable to someone who can sponsor your career.

Have a short- and long-term career plan but recognize that serendipity played a role in the advancement of a number of the women scientists we interviewed. Be flexible. When a trusted coach or mentor suggests a career move that seems to fall "outside the box," give it serious consideration.

Mentor other women in your organization.

Look for women mentors in other organizations. Take advantage of external networks, e.g., professional associations along with internal opportunities to meet and work with other women professional in your company.

Let people know when you are interested in an assignment or development opportunity. Don't expect other people to look out for your career. Male managers frequently assume that women aren't interested in certain types of assignments. Let them know you are.

What Companies Should Do

Just as much as understanding the experiences of women scientists in industry, Catalyst's goal in conducting this research was to expand corporate opportunities for technical women and to advise companies on the recruitment, retention, and advancement of these women. Some companies have been leaders in improving the retention and mobility of women scientists. At the conclusion of this report, the initiatives of eight such outstanding companies are profiled. It is our hope that other companies will replicate these initiatives.

In general, there are a variety of steps successful companies can take to enhance their recruitment, retention, and advancement of women scientists.

Recruitment

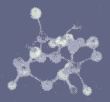
Companies that are interested in expanding their pool of women technical professionals have recognized the need to market opportunities actively for women scientists in industry and in their company. This research shows that women working on graduate degrees and post-doctorates in academia, along with the faculty on whom they depend for career advice, have little awareness of the range of projects, products, and services with which scientists in industry are involved. Furthermore, industry needs to acknowledge and address negative stereotypes of scientists working in industry as having "sold out."

Recommended action steps to reach out to women scientists, which focus on increasing visibility of careers for women in industrial science and creating win-win collaborations between the academic and industrial sectors, include:

- Fund internships that provide promising female graduate students and professors with access to successful women scientists in your company and exposure to stimulating research activities;
- Set up mentoring programs that reach down into educational institutions, bringing women scientists working in your company together with women science students;
- Collaborate with professional associations of women in science to develop and fund speakers series and other venues which would provide opportunities for distinguished women scientists in industry, and faculty and students in university science programs, to discuss substantive issues in science;
- Provide fellowships and seed money for research to promising women graduate students who are recruitment targets for your company;
- Provide funding for visiting lectureships for distinguished industrial scientists; and,
- Provide funding for distinguished academic scientists to work with scientists in your company as "loaned academics."

Retention

The talent pool of women scientists, engineers and technical specialists remains small compared to that in other fields. And among this group, the representation of women of color is minuscule. It follows that the competition for the best and brightest female graduates with such credentials is fierce. For this reason companies have had to devote considerable energy and resources to recruitment activities related to attracting such women to their company. However, in pursuing their recruitment targets, companies have tended to ignore the issue of what happens to these women after they are hired. When disproportionate turnover of female recruits occurs, companies typically redouble their efforts and investment on the recruitment side rather than stopping to examine the reasons behind undesirable attrition.



In the end, failure to retain such women is costly. Obvious costs include failure to leverage the investment made in recruiting and training, and the cost of replacing seasoned professionals. Beyond these are less visible costs such as the impact on project teams of losing a valued and productive member and the impact on time lines for deliverables, with attendant negative outcomes re: customer satisfaction.

Catalyst research shows that "regretted losses" of women scientists (as undesirable turnover is referred to at Procter & Gamble, one of the Best Practice companies cited later in this report) has the obvious effect of reducing the talent pool of seasoned women scientists that are being groomed for leadership roles both on the technical and management side of companies research, development, and manufacturing businesses. Less obvious is the effect that turnover of seasoned women scientists will have on companies' ongoing efforts to attract the best and brightest female graduates from top schools to their organizations.

Recommended action steps to retain female scientists include:

- Carry out internal bench marking to determine if your company has a disproportionate turnover of women scientists compared to male scientists or women professionals in other functional areas/business units. Questions to address: At what point in their careers are your women scientists most likely to leave and how does that compare with other groups? What are the reasons for leaving that are given during exit interviews? Is excessive turnover associated with any other factors such as location or supervisory personnel? Consider using an outside organization to conduct anonymous exit interviews with regretted losses six to 12 months after they've left your company.

- Monitor retention of women scientists over time to measure progress or setbacks.

- Articulate the unique business imperatives for your company to retain and advance women scientists in both technical and management roles.

- Hold supervisors accountable for retention of women technical professionals and managers—at P&G, for example, managers must explain regretted losses that occurred during the period covered by the review.

- Use focus groups and surveys to monitor the early and ongoing experiences of women scientists relating to assignments, supervision, feedback, and coaching they are receiving from supervisors.

Development and Advancement Action Steps

- Analyze career paths of successful scientists at your company to identify critical experiences that are associated with recognition and advancement.

- Develop individual career plans for women scientists that include both short- and long-term goals. Discuss career expectations with entry-level women professionals. Provide

information on the opportunities and challenges of technical vs. management track assignments.

- Consider developing a rotation program for entry-level scientists and other technical professionals that provides exposure to manufacturing, commercial, and support functions in your organization. Research shows that without formal intervention, women technical professionals will tend to be over-represented in staff roles and under-represented in product development, production, sales, and marketing functions where their unique perspectives can make an important contribution to your company's bottom line.

- Encourage senior scientists to include younger women scientists in professional associations and meetings both inside and outside your organization.

- Most companies have targeted numerical goals. Equal emphasis needs to be placed on progress related to development goals for individual women, to fill the pipeline for each opening.

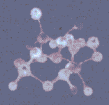
- Ensure that women are represented on slates for special assignments and promotions. Challenge managers to ensure women have the breadth and depth of experience to receive serious consideration for advancement opportunities. Reward managers for mentoring and sponsoring female technical professionals. In science this involves joint authorship of publications and recognition for patent awards.

Culture and Work Environment Action Steps

- Encourage participation of women scientists in professional women's networks both inside and outside of your company. Since women scientists who were interviewed by Catalyst described feelings of isolation from other women within their own company, there is a need to create venues that bring this group together to profile successful senior women and provide opportunities for networking and the development of mentoring relationships among generations of women scientists.

- Ensure that manufacturing and research facilities are free of offensive materials, language and behaviors that would constitute a hostile work environment for female technical professionals.

- Assess whether policies and programs that enable employees to balance work and family responsibilities are adequately communicated to women technical professionals. Catalyst research shows that male managers in functional areas and field locations where women have not achieved a critical mass may not be aware of such policies or may believe that they are not required to implement them in their business units due to "special circumstances," e.g., production schedules, shift work, etc.



Chapter 5: Best Practices for Companies to Emulate

Making The Corporate Connection

Companies need to do a better job of marketing themselves to the next generation of women scientists. One way to do that is to build stronger relationships between universities and corporations. Corporate mentors can offer students a realistic picture of industrial careers and provide advice regarding career planning. The following three corporate best practices embody this approach and correlate to the report findings.

1. Support Education to Develop the Technical Pipeline

Numerous reports show that the gender gap in science begins in childhood. According to the American Association of University Women, girls are not encouraged to pursue math and science in school, resulting in a smaller pool of women qualified for positions that require these skills. Girls' interest in science begins to wane precipitously around junior high school. The trend continues through high school and college (Jane Butler Kahle, "Opportunities and Obstacles: Science Education in the Schools," *The Equity Equation*).

Not only are there not enough women in the science pipeline (in 1995, women earned 17.5 percent of the Bachelors degrees in engineering, 16.7 percent of Masters, and 12.1 percent of doctoral degrees), a 1993 Committee on Women in Science and Engineering study reports that those women in the pipeline fall out at double the rate of men. Corporations have an important role to play in supporting and mentoring women who are studying to be scientists. The AT&T Graduate Fellowship Program demonstrates how companies can successfully approach this issue.

AT&T Graduate Fellowship Program

Communications Company
Headquarters: Basking Ridge, NJ
Employees: 120,000
Annual Revenues: 51 billion (1997)

The Initiative

AT&T Labs Fellowship Program was started in 1975 to offer educational support to women and under-represented minorities. The fellowship covers all educational expenses during the school year, a stipend for living expenses, and support for attending scientific conferences.

In addition, AT&T Labs pairs graduate students with experienced scientists who act as their mentors during the academic year. This relationship is one of the most important elements of the program. The mentor is expected to provide:

- Career Guidance and Support
- Assignment and Summer Employment Opportunities
- Coaching and Performance Feedback
- Advocacy in the professional culture and networking arenas

Within the company it is considered an honor to serve as a mentor. Scientists who take on the role are supported by an external consultant who provides training and advice throughout the program.

The monitoring and accountability of this initiative is under the aegis of the Fellowship Oversight Committee, composed of AT&T Labs professionals. The committee reviews, measures, and maximizes the effectiveness of the program providing:

- Annual selection of Fellow recipients (in-depth interviews to increase good mentor pairing)
- Training for new mentors
- Mentor support from an academic advisor
- Orientation seminars for new fellows
- Evaluation and review of mentor effectiveness
- Awards for outstanding mentors
- Activities to improve the overall effectiveness of the program

Key Elements

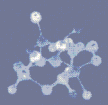
1) Combining financial support with a focus on mentoring.

2) A small enough program to ensure personal attention for each fellow.

3) A one-on-one relationship that provides technical assistance, builds professional contacts, and educates students about careers in industry.

Impact

- From 1980 to 1998, 135 women have received Ph.D.'s through this program. In fact, 65 to 70% of fellowship recipients have completed the Ph.D. over the course of the program. Almost all of the other recipients have received Master's degrees in their chosen fields. There are an additional 20 women currently enrolled in the program.



- Faster progress to Ph.D. degrees for women and minorities (average awardee completes the program six months to a year earlier than the national median for math and science Ph.D.'s).
- High-ranking women graduates of the program include a Vice President at AT&T, a Director at Lucent Bell Labs, a department head at Spelman College, a program director at the National Science Foundation, and the Chief Technology Officer of Raychem Corporation.
- AT&T's fellowship program has led to the benchmarking of similar programs by, for example, The National Physical Sciences Consortium.
- This program received the 1998 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring for an institution. This award is sponsored by the National Science Foundation and was awarded to AT&T by President Clinton in September, 1998.

2. Encourage Mentoring

All of the women we interviewed acknowledged the importance of mentoring, even those who never had mentors of their own. Mentoring is most successful when it is part of a comprehensive career development program. Successful programs all share fundamental success factors: identification of clear objectives, support from top management, integration with a comprehensive career development approach, devotion of adequate resources and planning, and clear communication of expectations to both mentor and mentee.

MentorNet

National electronic industrial mentoring network
Joint venture between academia and industry
Headquarters: San Jose, California

The Women in Engineering Programs & Advocates Network (WEPAN) developed MentorNet to improve the retention of women students in science and engineering. Since most students with technical backgrounds will find employment in the private sector, this national mentoring program focuses on educating women about opportunities in industry. Because traditional mentoring is often limited to participants who live or work in the same location, MentorNet uses electronic mail to connect students with mentors throughout the U.S.A. The AT&T and Intel Corporations provided initial funding for the project, which is housed at San Jose State University.

The Initiative

MentorNet grew out of a pilot program at Dartmouth College in 1995. The program pairs undergraduate and graduate women in science, math, and engineering with industrial scientists using e-mail as the primary means of communicating and building a relationship. Mentoring provides one-on-one encouragement and support to female students who often feel isolated in their fields of study. Through this program experienced scientists and engineers acquaint students with career opportunities, offer advice, and provide access to professional networks.

Students and mentors are matched based on shared technical interests and are expected to communicate at least twice a month or more frequently if both desire. The pair is committed to the relationship for one academic year and receives direction for setting up their relationship including setting goals, clarifying expectations, and following through on their commitment. A mentoring coach provides information during that time through an electronic newsletter and is available for consultation if problems or issues arise.

An advisory board composed of corporate and university stakeholders establishes program priorities and metrics for performance.

Project benefits include:

- Students gain information, advice, and encouragement about career choices in science and engineering
- Universities benefit from increased retention and pre-professional development of students in technical fields.
- Corporations help prepare students for prospective employment and have the opportunity to focus students' attention to their particular business opportunities

The mentors also cited benefits including networking with newly emerging colleagues, supporting job recruitment, becoming conversant with the young people soon to join the work force, and fostering communications skills.

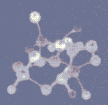
Key Elements

1) The partnership between universities and corporations;
2) The convenience and cost effectiveness of e-mail for building relationships;
3) A focus on matching pairs based on technical expertise;
4) The availability of a mentoring coach to provide information and resolve problems.

Impact

Over 200 students and nearly that number of corporate mentors have participated in the program so far. In a survey, 75 percent of the mentees rated the value of having a mentor through the program as high or very high. They also reported an increased understanding of day to day work life in industry, the range of possible careers, and the difference between a career path in the private sector vs. academia.

MentorNet program organizers aim to match 5,000 pairs of students and mentors over the next five years. If your company is interested in participating you can contact:



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Procter & Gamble: MentorUp

Consumer Products
Headquarters: Cincinnati, Ohio
Employees: 106,000
Annual revenues: 35 billion
Catalyst Award: 1998

In 1994, Procter & Gamble discovered that the company had a high rate of female attrition and that women were under-represented at the higher levels of brand management. To address this imbalance P&G created a task force to examine the corporate culture, support work/life balance, and improve coaching and mentoring. The resulting *Advancement of Women* initiative has been very successful and led to numerous changes within the company. One critical element of this effort is P&G's "MentorUp" program.

The Initiative

In order to educate senior managers on the subtle issues facing women in the corporate environment, Procter & Gamble created a program where junior women mentor senior executives. After conducting a "regretted losses" study of female alums, the company learned that women perceived upper management as "unaware" of key issues facing women. MentorUp was an innovative response to the problem and the program has the following objectives:

- Provide senior-level managers with informal and non-threatening feedback on how to manage issues specific to women
- Provide senior managers with a female sounding board to discuss ideas/programs
- Create an opportunity for junior women to develop quality relationships with senior managers

MentorUp was initiated with a half day kick-off session which included a panel discussion with P&G managers committed to mentoring as a means of helping retain women at the company. During the pilot, bi-monthly discussion guides were distributed to the mentor/mentee teams to

facilitate relationship building. And two mentors' lunches were held in each sector during the year to share program feedback and ideas among the group and with the corporate steering team.

Key Elements

1) Program is part of a comprehensive women's advancement initiative
2) Mentoring focus on upward feedback
3) Emphasis on relationship building
4) Regular opportunities to evaluate the program and share ideas with the steering team

Impact

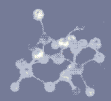
As a result of the entire initiative, the number of women at the general manager/vice president level has more than tripled from five to 18 in five years. The MentorUp program itself has increased awareness and understanding among senior management of issues affecting women as measured by employee survey results. All mentees and mentors rated the program as an important one for them personally to participate in.

Once Inside A Corporate Career

For those who've already chosen a corporate career, it's crucial to be aware of the barriers that keep women from doing their best and attaining the top jobs. These best practices go a long way toward leveling the playing field.

3. Develop Programs that Target High-Potential Women and Offer Rotational Assignments

Several women in this study discussed the importance of cross-sector or cross-functional experience to their career mobility. Formal job rotation programs offer an employee exposure to different areas of a company and opportunities to meet a range of managers. This visibility across an organization can be particularly valuable to women who are often excluded from informal networks.



Consolidated Edison of New York: Management Intern Program and Blue Collar Prep Program[1]

Public utility
Headquarters: New York City
Employees: 15,200
Annual revenues: $6.9 million
Catalyst Award: 1988

Con Ed is one of the largest publicly owned gas and electric utilities in the United States. The company provides power to more than eight million people in most of New York City and Westchester County. It also supplies gas in Manhattan, the Bronx, and parts of Queens and Westchester and steam in part of Manhattan. It sells electricity to government customers through the New York Power Authority.

Both the Management Intern Program and the support of the Blue Collar Prep Program demonstrate Con Edison's dedication to the advancement of women in nontraditional jobs. The Management Intern Program allows recent college graduates the opportunity to gain experience in their field. The Blue Collar Prep Program provides training and support for women who wish to enter traditionally male-dominated, blue collar jobs. Con Ed received the Catalyst Award in 1988.

Management Intern Program

Con Edison found that attracting women to a company where most jobs require physical labor is a challenge. Motivated by changing workforce demographics and a bottom-line concern to develop and diversify management talent, Con Edison created a comprehensive strategy called "Commitment to Women With Technical Talent." The strategy was created to recruit, develop, and promote qualified women. The centerpiece of this strategy is the Management Intern Program, which Con Edison launched in 1981. This program was established for two reasons: to intensify efforts to recruit women and to develop the future managers of the company. In 1993, Con Ed divided the Management Intern Program into several organization-based programs:

- The Field Supervisory Intern Program for Engineers
- The Assistant Engineer Program
- The Gas Operation Management Development Program
- The Information Resources Assistant Computer Analyst Program
- The Business Intern Program (which is organization-wide)

[1]This best practice is excerpted from *Advancing Women in Business, The Catalyst Guide to Best Practices from the Corporate Leaders*, 1998, Jossey-Bass.

Another recent change is in the administration of the program. The Management Intern Program was once run solely by the College Programs Department. Now, the Recruitment and Staffing Department hires and places the interns, and Con Ed's Learning Center is responsible for the administration of the program. Mentors assist the director of the Learning Center by providing feedback to evaluate the effectiveness of its program.

The Programs

The programs generally recruit between ten and twenty college graduates annually. Managers conduct campus interviews with all potential candidates, who are assessed according to skills identified by the Competitive Skills Team. The managers in the recruiting and staffing department select candidates for the program. They are looking for technical competence, leadership potential, and communication skills. The Gas Operations Management and the Business Intern Programs both run for two years, while the Assistant Engineer and Field Supervisory Intern Programs take three years. Each program involves several short-term, rotational assignments where the interns receive on-the-job supervision and mentoring from an assigned advisor.

After the first year, engineers go into a three-year position as first-line supervisors followed by three years in central operations. For interns who are not engineers, a one-year administrative training job follows the Management Intern Program. That year is spent in a field assignment in operations. These programs provide all participants with a range of experience and expose them to the field environment.

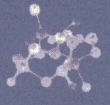
Each intern is assigned a mentor from mid- or upper-level management who is responsible for tracking the intern's progress. Managers meet regularly with interns to provide guidance and assistance. The assignments are evaluated by a Functional Review Committee made up of senior-level managers and chaired by general managers. The program administrator is part of every review committee.

Accountability

When they complete the program, all graduates are expected to be well-rounded and able to fit into the department to which they are assigned. If the departments have a problem with a newly placed graduate, they tell the Learning Center. The program coordinator is made aware of these problems and is held accountable for the program's success. To date, there have been no reported problems from any of the departments.

Communication

The Management Intern Program is highlighted throughout company publications. Con Ed recruits for the program from among seniors at targeted colleges and universities and attends job fairs to publicize the program.



Impact

While women make up only 17 percent of engineering students nationally, they are more than 30 percent of the participants in the Management Intern Program. There has been a great demand for program graduates from departments. All graduates are placed into departments upon completion of the program.

Blue Collar Prep Program

Con Edison is a co-sponsor of the Blue Collar Prep program, developed by NEW (Nontraditional Employment of Women), a nonprofit organization based in New York City. This program prepares women for nontraditional jobs educationally, psychologically, and physically through training. The program is financed by grants from government and private agencies.

Con Edison uses the Blue Collar Prep program to recruit women to work in nontraditional jobs, for example, as general utility workers. When a number of openings are available at the company, Con Edison will contact the Blue Collar Prep Program and recruit from its pool of qualified women. As needed, Con Edison may also provide funding, training instructors, and tools in support of the Blue Collar Prep program. Recruiting efforts vary according to the entry-level positions available.

The Program

The program focuses on helping women and their future managers address potential barriers to their acceptance in the field. The women are trained in auto mechanics and general utility. The supervisors receive training on sensitivity/gender issues. During training the women are assigned mentors. Training is administered by NEW and varies according to the specific contract of funding. Length of time, targeted population, and expected achievement all vary with the contract. For example, training may be longer and made up of different elements, including basic reading and math skills, if a program is targeted to a low educational-level population.

Since its beginning, collaboration with existing nonprofit organizations has been a successful recruiting strategy for Con Ed. The company has similar relationships with various other nonprofit training programs. When Con Ed knows of an organization with at least 30 percent female trainees or participants, Con Ed will work with the organization and recruit as many qualified candidates as possible. The recruiting efforts continually work toward a fundamental goal at Con Ed: to ensure that a high percentage of qualified women is represented in the selection process.

Communication

Information on Con Ed's recruitment efforts is highlighted in internal publications. There has also been some video coverage regarding the number of women Con Ed brings into nontraditional fields. Any additional highlights on the issue are communicated through a weekly e-mail bulletin.

Key Elements

1) A high level of support and understanding of the program from upper-level management
2) Pairing women with mentors
3) Identifying critical staffing needs for training and recruiting
4) Focus on getting women into operations positions, critical to advancement at Con Ed

Impact

The success of Con Ed's partnership with the Blue Collar Prep Program has encouraged other companies to implement similar recruiting efforts. Therefore the nonprofit training organizations that Con Ed has experienced success with now have a much wider selection from which to choose. This has, in turn, created a more competitive atmosphere for recruitment, essentially providing women with greater opportunities and more options for their careers.

About 15 to 20 women are hired per cycle (usually three or four cycles per year). In the last five years, women held an average of 22 percent of non-traditional jobs at Con Ed. This number is notable, considering the significant drop in overall employment at the company. The percentage of women in non-traditional jobs for the years 1993 to 1997 has been, respectively, 21 percent, 24 percent, 17 percent, 25.6 percent, and 21.2 percent. Projections for 1998 are estimated at 25 to 30 percent.

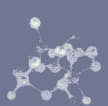
4. Ensure Equity on the Technical Career Path

Many corporations have two career paths for professionals with scientific and technical backgrounds. People can choose to advance through management by increasing their supervisory responsibilities or they can move up in a technical track by directly producing scientific work, a path created to encourage and reward technical excellence. Two of the women interviewed in this study were on the technical track; they held the senior title of fellow. Men traditionally held such positions (as the title implies), so companies need to actively monitor the recruitment and retention of women into the technical track of their organizations.

Texas Instruments: Women's Professional Development Team

Electronics
Headquarters: Dallas
Employees: 42,000
Annual Revenues: $10 billion

Texas Instruments (TI), an international technology company, is the world's leader in digital signal processing solutions. Products and services include semiconductors, calculators, and digital imaging. The company invented the first integrated circuit.



The Initiative

For each of their major business units, Texas Instruments has a governing body called the Technical Council. In 1994, the TI Technical Council created the Women's Professional Development Team to evaluate the environment for technical women at TI. The Council was concerned that women were under represented on the technical career ladder, which is a peer selection process that recognizes technical achievement. The team, composed of technical and non-technical women from across TI, identified four major issues that required change. TI took action based on their recommendations:

Establish diversity accountability. Each year the TI Technical Council Chair reviews the diversity statistics of the technical ladder regarding race and gender. The chairs from each business unit present these statistics along with their analysis and plans to address gaps.

Expand career development policies and programs. In 1994, a TI vice president and engineer from the Women's Professional Development Team created a mentoring workshop called "Have the Tools and Know the Rules." The presentation covers four areas of career development and the steps which individuals can take to prepare themselves to be mentored. Over 1000 TI employees have attended this two-hour, interactive workshop.

The Council championed TECH97, the first conference sponsored by women in technology at TI.

In addition, TI's Training and Organizational Effectiveness department was asked to create a one stop shopping site for technical training. The objective was to increase access to internal and external courses for the technical community.

Improve communication regarding the technical ladder. The team believed there needed to be more communication about the criteria for the technical ladder and the process for electing new candidates. TI created a brochure describing the technical career path and used the materials in recruiting packets and when orienting new hires. The women's initiative held brown bag sessions to share information with technical women throughout the organization. Finally, the technical community web page was created which includes election criteria, nomination forms, suggestions on how to complete the application, and information about the election calendar.

Build awareness and support education for managing diversity. The technical council sponsored workshops on women and men as colleagues. All council members were encouraged to take TI's two-day diversity awareness training.

Key Elements

1) Clear accountability measures
2) Emphasis on career development training
3) A formal communications strategy
4) Education for managers on how to support diversity

Impact

The percentage of women on TI's technical ladder has increased over 50 percent from 1995 to 1999. A woman was appointed as the first female chair of a Technical Council.

5. Foster Women's Networks

Companies can counter the exclusion of the old boy network by supporting the formation of corporate women's groups. Networks serve to overcome the sense of isolation that technical women experience in industry. As discussed in the findings, women are excluded from informal male networks and often don't have access to important business information. By supporting a formal network, companies can provide a forum for women to exchange ideas and share their experiences with each other. Participation in such groups can be critical to younger women who are seeking career advice and role models. Finally, women's networks can play an advisory role by making recommendations to senior management on programs and policies that relate to the retention and development of women.

International Business Machines: Watson Technical Women's Network

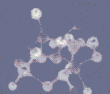
Computers and precision instruments
Headquarters: Armonk, NY
Employees: 270,000
Annual revenues: 79 billion
Catalyst Award: 1987

In 1995, IBM CEO Lou Gerstner convened eight executive taskforces to examine how the company could make diverse employee groups feel more valued. One of the joint recommendations that emerged across taskforces was that IBM should support the creation of diversity networks for employees. Once the corporation officially sanctioned the creation of networks, fifty groups formed across IBM's worldwide businesses.

The Initiative

In 1997 a group of technical women from the Watson Research Division decided to form their own network. Because men comprise a majority of IBM's total research staff, this group felt a network would provide a unique opportunity for technical women to discuss career issues and share success strategies with one another. The network has the following goals:

- Provide a forum for the exchange of ideas
- Participate in outreach to girls and young women with an interest in science and math
- Assist in attracting, recruiting, and retaining qualified women to Research
- Enhance Research as a female-friendly place
- Act as a resource/liaison to senior IBM management and other women's groups



Both men and women are eligible to attend and the group has monthly meetings. Discussion topics have included mentoring, gender communications, and careers in technology management. Although IBM does not fund the network directly, the company does provide meeting space and a server where the group maintains a home page and posts information about upcoming meetings.

In the future, the group hopes to create a mentoring program where senior members can offer guidance to their junior colleagues.

Impact

The group has generated a high level of awareness about its activities and women's issues generally among the research staff. The network mobilized its members to participate in "Engineers Week" where IBM employees speak at local schools to encourage students to consider careers in science and engineering. Because their membership includes senior women executives, the group is also able to update upper-level management on issues that affect women at all levels of the organization.

Key Elements

The key elements that make this an effective practice include:

1) networking with a career development focus
2) upper management support
3) outreach opportunities with girls studying science and math

6. Provide Visibility for Women's Technical Achievements

A major theme of this study was the difficulty women often have in being recognized for their technical accomplishments. Women reported having to constantly re-establish their technical credibility and feeling 'overripe' for promotion. One way companies can combat this tendency is to create forums for highlighting women's technical contributions. Hewlett-Packard provides a model for this approach.

Hewlett-Packard Company: Technical Women's Conference

Computers and precision instruments
Headquarters: Palo Alto, California
Employees 121,900
Annual revenues: $42.9 billion (1997)
Catalyst Award: 1992

Hewlett-Packard is an international manufacturer of measurement and computation products and systems. The company's more than 10,000 products and services are used in industry, business, engineering, science, medicine, and education. Hewlett-Packard is one of the 50 largest industrial corporations in America. Hewlett-Packard received the Catalyst Award in 1992.

The Initiative

The Technical Women's Conference began in 1988. It was a grassroots effort by company women established to showcase the achievements and contributions of HP's female engineers and scientists. The scope of the conference has grown to include professional women in sales and marketing positions. The conference gives women (both the organizers and presenters) an opportunity to develop leadership skills, as well as help them to network in a highly decentralized organization. It features:

- top management speakers
- technical presentations by HP women engineers, scientists and professional staff
- career development workshops

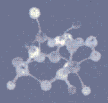
Both men and women are eligible to attend. Most of the participants are women (90 percent), who come from around the world to attend. The Technical Women's Conference is held every two years over a three-day period. Specific objectives of the Conference are to:

- Provide a forum to highlight the technical contributions of women engineers and scientists and to encourage the exchange of ideas
- Promote the development of technical contacts throughout the company and thereby increase the resources available to the female technical professionals for technical problem-solving and product development
- Encourage career development and personal growth for technical women in preparation for leadership roles, by including cross-functional opportunities, lateral career move ment, and management experience
- Invest special effort to involve minority women and other potentially isolated groups

Accountability

A core voluntary committee of 20 women organizes the conference. The Conference is fully funded by HP. The organizing committee selects an advisory board made up of upper-level management, including general managers and representatives from corporate personnel. The results of the conference evaluations, which include a survey of women's concerns at HP, are reported to the Advisory Board and to appropriate diversity personnel.

HP recommends that the organizing committee be a diverse group that represents various functions and geographic locations. The organizing committee should also enlist the help of general managers, in addition to human resources. Most importantly, the benefits to the company should be clearly outlined in a proposal to upper management.



Key Elements

1) advisory board of upper-level management
2) funding by HR
3) voluntary committee to organize the Conference
4) survey of women's concerns at HP
5) a focus on achievements and technical expertise
6) networking with a business focus

Although, in this case, the conference features the work of female engineers, scientists, and marketing, the model of a formal gathering to feature the work contributed by women and provide a forum for networking and visibility can be replicated in many workplaces.

Impact

The conference has enjoyed remarkable success. In 1988, 400 employees attended the first conference; by 1998, 2,865 employees attended. HP believes that the conference helps raise awareness about the contributions women make to the company. Since the first conference, the number of local women's networks at HP has increased.

7. Support Dual-Career Couples

According to the US Bureau of Labor statistics, in 1996 members of dual-earner families made up 45 percent of the working population. In this study, only two women were single and half of the married women cited having a supportive spouse as critical to their career advancement. Clearly companies need to address the needs of dual-career couples or they will risk losing valuable employees.

The Dow Chemical Company: Relocation Assistance[2]

Chemicals
Headquarters: Midland, Michigan
Employees: 62,000
Annual revenues: $20.2 billion
Catalyst Award: 1995

The Dow Chemical Company is one of the country's twenty-five largest industrial companies, with more than half of its sales outside the United States. Diversity efforts date back to 1987 and include both national and foreign operations. In the late 1980s, the company recognized that

[2]This best practice is excerpted from *Advancing Women in Business, The Catalyst Guide to Best Practices from the Corporate Leaders*, 1998, Jossey-Bass.

the diversity of its workforce would be critical to its competitiveness and created a Diversity Steering Team of senior managers, as well as two advisory committees, to consider issues regarding women and minorities and recommend actions to Dow's operating board. Dow's 'Blueprint for Diversity' included several innovative components, including relocation assistance for dual-career couples.

The Initiative

As part of Dow Chemical's diversity initiative, the organization recognized that many of its employees were in dual-career families, many of them dual-Dow families in which husband and wife are both Dow Chemical employees. In response to the increasing numbers of dual-career couples and the need for employees to relocate to advance, Dow decided to expand the dual-career assistance program to address the needs of the 'trailing spouse.'

When the company re-locates a member of the dual-career family, it provides up to three months' reimbursement for a partner's lost income while he or she is looking for a job in the new location. However, if the couple decides to live apart, the company reimburses commuting expenses. To aid with the transition, the company offers extensive job-search assistance and career counseling available for partners.

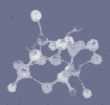
In addition, Dow will refund the cost of tuition, professional exams, fees for licenses or certification, expenses for interview trips, and, for a cross-border move, assistance which can be in the form of reimbursement for services from an immigration firm to enable the partner to relocate.

Impact

Dow has found that the program has removed barriers associated with relocation of dual-career couples and made the relocation process a smoother one.

Key Elements

1) Reimbursements for partners' relocation
2) Job search assistance for partners



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Also by Catalyst

Knowing the Territory: Women in Sales
This 1995 Catalyst report provides a solutions-oriented assessment of the issues that affect the nation's business-to-business sales representatives. It also includes a best-practices section, highlighting model companies.

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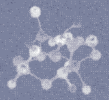

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