DUAL-SCIENCE-CAREER COUPLES: SURVEY RESULTS

Laurie McNeil
Dept. of Physics and Astronomy, University of North Carolina, Chapel Hill, NC

and

Marc Sher
Physics Department, College of William and Mary, Williamsburg, VA

I. INTRODUCTION

Physicists are increasingly faced with the "two-body problem," i.e. the difficulty of finding two professional jobs (possibly two physics jobs) in the same geographic location. This problem has a particularly acute impact on women, in part because 43% of married female physicists are married to other physicists, whereas only 6% of married male physicists have a physicist spouse[1]. The fact that the density of available jobs for physicists is low in most places at any particular time means that the challenge of the dual job search can have a significant effect on a physicist's career. The two-body problem also poses a challenge for institutions that hire physicists, as it is increasingly likely that the top candidate in a search will have a spouse who is also seeking professional employment. Lack of suitable employment for the spouse can lead a candidate to reject a job offer, or to leave a job after a few years if the spouse can find a better situation elsewhere. The frustration of unemployment and underemployment can also cause some to leave physics altogether, representing a net loss to the profession. As these employment problems are more acute for women, lack of attention to dual-career issues can hamper efforts to increase the representation of qualified women in physics.

In this article, we present the results of a survey on this subject that we conducted over the World Wide Web in 1998. We asked about the experiences of physicist (and other scientist) couples in finding employment for both partners in the same location, and about solutions that had proved successful. From the responses, we are able to describe the various ways in which the two-body problem manifests itself, as well as offer solutions for institutions and individuals to try.

II. WHY SHOULD INSTITUTIONS BE CONCERNED?

The key to finding solutions to the challenges faced by dual-career couples is first to recognize that it is in the interests of all concerned to respond proactively to the situation. The interests of the job-seekers in such action is obvious, but it is also true that addressing the situation can benefit the institutions doing the hiring and the physics profession as a whole. In recent years some areas of physics employment have experienced a "buyer's market," in which the number of applicants greatly exceeds the number of available positions. This has led some institutions to conclude that with so many qualified applicants available, it is possible to restrict consideration to only those candidates without spousal complications. Since such an action can be argued to constitute discrimination on the basis of marital status, it is not one that is easily defended. Institutions that simply ignore the two-body problem, making no effort to assist their chosen candidates in finding employment for their spouses, can find themselves unable to hire the individuals they wish if the spouse cannot find a satisfactory job in the area. Even if the candidate accepts the job, he or she may soon leave it if better prospects for employment of the spouse become available elsewhere.

For the profession as a whole, it is important to recognize that the dual-career problem represents a significant barrier to the enhancement of the representation of women in physics. As noted above, female physicists are far more likely to be married to physicists than are male physicists. The difficulty of finding two scientific jobs in one place extends beyond physics, of course, and over 68% of married female physicists are married to scientists (compared to only 17% of male physicists). Women constitute only 6% of U.S. physicists overall, but 35% of all female physicists 31 years old or younger, and women represent 14% of that age group. 44% of these women are married (vs. 36% of the men)[1]. This means that, although the number of women who are (or are about to be) at the point of seeking a permanent career position is increasing, almost one third of them will do so with the complication of a spouse who is also seeking scientific employment. Though statistics on this point are difficult to obtain, anecdotal evidence (including the results of our survey) indicate that dual-career employment difficulties lead in many cases to women leaving physics altogether because they cannot find satisfactory employment. This means that institutions' lack of attention to dual-career employment issues contributes to the "leaky pipeline" of women in physics, and thus to the loss of the talents of a large pool of scientists.

III. SURVEY

(a) Design and implementation of the survey

In order to assess the extent of the dual-career couple problem, to examine its effects on the scientific community and to learn about possible solutions that have proven successful, we conducted a Web-based survey in 1998. Because our primary goal was to obtain information about approaches that institutions might take to the problem, we did not attempt to use rigorous statistical sampling techniques or sophisticated quantitative analysis of the responses.

In designing the survey, the first question to be considered was the nature of the group to be studied. The dual-career couple problem is a major problem throughout society, and is neither restricted to academia nor to the scientific community. However, the physics community stands out in two respects. First, it is one of the few with such a large gender disparity (6% of U.S. physicists are women), and thus the dual-career couple problem has a much greater disproportionate effect on women in physics than in other occupations. Second, the density of positions is relatively low, leading to much greater difficulty in finding positions in the same location for both members of a couple. Thus, we concentrated on the physics community. We did not distinguish between couples who were married and those who were partnered but not married, and throughout the report the terms “spouse” and “partner” are used interchangeably.

Although we were particularly interested in couples in which both were physicists, we were also very interested in couples with one physicist and one non-physics scientist, since many of these couples have very similar difficulties to two-physicist couples (and different issues can arise in academia when two departments are involved). There are, of course, a large number of physicists married to non-scientists, but we simply couldn't

cover all possibilities (although we did welcome responses from physicists married to non-scientists in academia, since many of the issues involved are similar).

In addition to obtaining the demographics of our respondents and their partners (gender, age, current positions, children, career goals), the focus of the survey was their responses to open-ended questions asking about the problems that they (and others) had faced, institutional responses, and possible solutions. The survey was Web-based, for several reasons: most physicists have ready access to the Web, it was much cheaper than mailing thousands of surveys around the country, and it was easy for us to analyze the results.

With the help of David Aday and Susan Bosworth (sociologists at William and Mary) we prepared a preliminary version of the survey. We then performed a trial run in late 1997 by asking members of two listservs (WiPHYS---the women in physics listserv of the APS, and clim-fys, a listserv established some years ago by the Forum on Physics and Society) to respond and to comment on the survey. We received a few dozen responses, and quite a few good suggestions. We incorporated these suggestions into a final version of the survey, which contained 26 questions. Eight of the questions required narrative answers. The 26 questions appear in Appendix A.

To inform the physics community of the survey, we arranged for e-mail messages to be sent out in January 1998 to the above listservs and to the memberships of the Forum on Physics and Society, the Forum on Education and the Forum on Industrial and Applied Physics. We sent flyers to every college and university physics department in the country, and posted notices in Physics Today and APS News. In April, we had reminder e-mail messages sent out. We began reading and analyzing the results in June 1998. We read these narratives individually. No record was kept of the identity of the respondents, and any information that could be used to identify respondents won't appear in the report.

(b) Results

We were delighted by the overwhelming response to the survey. We received 620, many with very detailed answers to some of the questions. Included in this number were a dozen sent via mail (the survey had been printed off the website, and mailed), an option we had provided for respondents concerned about internet privacy. Given that the membership of the APS is roughly 40,000, that the number of women physicists is 6% of the total, that 51% of these are married, and that 68% of these are married to scientists, one finds that the number of female physicists married to scientists (in the United States) is approximately 830. Given that sample size, a survey response rate of several hundred was spectacular, and indicates that our survey does give an accurate picture of the current situation. The large response also indicates that the subject of the survey is an area of serious concern to the responding population.

Of the respondents, 89% had partners who were scientists (the remainder were often in academia), thus this study really did focus on dual-career science couples. Approximately half of the respondents were dual-career physics couples; in the other half, either the respondent or the partner was in another scientific field (although many listed astronomy or engineering--the lines separating these fields from physics are not always easy to draw). 57% of the respondents were women.

The age distribution was interesting. The female respondents had a mean age of 37.2; the male respondents had a mean age of 40.1. The median ages were two years lower (there were more 60-year-old respondents than 20-year-old). An important statistic in understanding the two-body problem is the age difference between the two partners. For each respondent, we determined the age of the male partner minus the age of the female partner. The average result was 2.1 years, and for only 15% of the respondents was the woman older. This means that the male partner will typically be further advanced in his career. As a result, when the dual-career couple problem becomes intractable, and one member of the couple must give up (or scale back) his or her career, it is generally much more likely that the woman will do so.

Given the average ages of the respondents, it is not surprising that the majority of them (and their partners) were looking for a faculty position during their most recent job search. Although the majority of APS members are in industry, most respondents were primarily interested in academic positions. This difference may have been influenced by the greater difficulty of informing potential respondents outside of academia of the existence of the survey. In the answer to question #10, for example, 20% said that they were searching for a postdoc, 64% for a faculty job, 25% for an industrial job and 20% for a government laboratory job (15% answered "other"). Obviously, many were looking at more than one possibility. The responses for their partners were similar. In the answer to the question of what type of job was ultimately taken, the results were similarly balanced, with 13% taking a postdoc, 32% taking a faculty job, 13% taking an industrial job and 14% taking a government laboratory position. The rest (22%) took a variety of positions, including a large number of soft-money and part-time positions. In response to the questions about whether or not their long-term and short-term goals have been affected by the dual-science-career problem, 45% responded that their long-term goals have not been affected, but only 14% responded that their short-term goals have not been affected. It thus appears that the overwhelming majority of respondents have had to make significant sacrifices due to this problem**.**

One of the most important questions was #16: “In your most recent job search, did you or your partner take a lower-level science job, non-scientific job (or no job) as a result of issues involved in dual-science-career couples”? Of those responding to this question, 60% answered that they or their partner had to take a lower-level science or non-scientific job in their most recent job search. This response is the key to understanding the impact of the dual career couple problem. The majority of respondents had to scale back their careers (or leave physics altogether) due to this problem. Most of these respondents were women, confirming that the problem disproportionately affects women.

Of much greater importance than the statistics, however, were the detailed narrative responses. We learned a great deal about the nature of the two-body problem, and learned of some interesting solutions. We now turn to a more detailed discussion of the problem, and then look at some potential solutions.

IV. PROBLEMS---HOW INSTITUTIONS MAKE THE PROBLEM WORSE

(a) Introduction

The increase in recent decades in the number of dual-career couples has meant that more professionals of all kinds are facing the problem of finding two suitable jobs in the same geographic area. The problem is particularly acute for physicists, however, because of the small size of the field. With the exception of a few "meccas" such as the Bay area, the number of physics (or physics-related) jobs available in a particular place at a given time is likely to be very low. Further difficulties arise when the two members of a couple are not at the same point in their careers (receipt of Ph.D., end of post-doc, etc.) at the same time, meaning that the two are seeking positions at different levels or at different times. This difficulty increases as the couple's careers advance, because higher-level positions are scarcer than entry-level ones. If the geographic location of the job search is based on the opportunities available to the more senior partner, the junior partner may not be able to find a position appropriate to obtain the credentials necessary for advancement later. If the junior partner's opportunities are the determining factor, it is difficult for the senior partner to find a suitable position as entry-level positions are always more numerous than senior ones.

The ideal, of course, is to find two jobs at the same time, in the same (desirable) location, with each job well suited to the qualifications of its holder. Most couples find this ideal to be unobtainable at some point in their careers. They may choose to have one member of the couple play the role of "leading partner" and take the best job available, thereby determining the location in which they will settle. The "trailing partner" then tries to find a suitable job in that location. The choice of which partner will play which role can be influenced by professional seniority, research specialty (often the specialist in the more arcane area will have more limited choices of location), preference in employment type (academic, industrial, national lab), or personal dynamics. The traditional pattern is for the man to lead and the woman to trail, but this is not the case for all couples, especially younger couples and those in which both members are at roughly the same stage in their careers. Regardless of which member leads, the trailing partner is often hard-pressed to find suitable employment. If no job commensurate with the trailing partner's qualifications can be found, s/he may end up underemployed or unemployed. This situation has led many people, and especially many women, to leave physics altogether.

While to a degree these problems are personal ones that individual physicists must solve for themselves, it is within the power of institutions to help ease the situation or to make it worse. In the responses to our survey, we have collected many examples of the ways in which potential employers can contribute to, or at least fail to cope with, the problems of dual-career couples. In this section, we will discuss the different ways in which institutions can make the problems worse. We first look at institutions that actually give **reduced** consideration to those with two-body problems, then at those that simply ignore the problem. We then consider examples in which institutions refuse to consider the spouse of an existing employee (often citing anti-nepotism laws) and also examples in which institutions take advantage of such spouses (the "captive" spouse). Finally, we report some especially egregious comments received by survey respondents.

(b) Reduced consideration for members of dual-career couples

One form of problematic response is to give reduced consideration to candidates who are in a dual-career situation, perhaps with the justification that a candidate free of such encumbrances would be more likely to accept a potential offer. If the candidate does not volunteer the information that she or he has a spouse who is a scientist, obtaining that information requires asking questions which are forbidden by Equal Employment Opportunity laws and guidelines. This may render such a response legally actionable. According to the experience of our respondents, during the screening and interview process, potential employers often ask questions that are not permitted under EEO laws. Members of academic search committees, in particular, are often unaware of the rules governing personal inquiries, or may be aware of them but choose to ignore them.

"My experience over 5 years of both applying for positions and being on search committees has been that numerous universities are either incredibly ill-informed about EEO/Affirmative Action law s(what they really say, not what the rumors are about them) or are just ignoring them."

"The department chair called me at home and asked me several questions about my marital status. He said that he knew these were illegal questions but that he was going to ask them anyway and I could decline to answer them if I wanted. When he found out I was married to a physicist, he said there would be no opportunities for him to be employed in the area. He also said they now screen all candidates because they have offered jobs many times only to be turned down in the end because a spouse could not find a job. A week later I called and found out I was totally off the list. I reported this to the dean and the search was cancelled."

Judging by the responses to our survey, these violations occur far more commonly when the candidate is female, because potential employers assume that the couple considers the male's job to be the deciding factor.

"In several places I was asked, even before the actual interview, if I would consider accepting the position even if my husband did not get an offer. My husband, on the other hand, never got this kind of question."

Improper questions are not limited to issues of partner's employment, but can also include the candidate's plans for childbearing. Such questions are almost never directed to males.

"Though the potential employer is not supposed to ask personal questions pertaining to [pregnancy], I found in my experience that questions of this sort do come up, and the interviewee is forced to state her position."

Once a potential employer finds a candidate to be desirable and contemplates making an offer to one member of a dual-career couple, often the employer makes assumptions about what the candidate's response will be rather than allowing the couple to make their own decision. In particular, potential employers often assume that a woman (far more often than a man) will refuse an offer if a suitable position is not available for the partner.

"I was told that they had already decided not to pursue my application because they "knew" that I wouldn't be interested in moving since my husband wasn't moving to a position in the area."

"Interview was cut short when discovered spouse was also a scientist."

"I have even gotten as far as an interview, then subsequently blown off with the explanation that they assumed I wouldn't be interested in relocating since they knew my spouse hadn't found a really good job in the area."

"I was asked where my husband would be working. It was made clear to me that if my husband did not have a job nearby, I would not be considered for the job."

(c) Ignoring the problem

Many of the respondents to our survey reported their experiences in asking the institution that had offered them a job for assistance in finding employment for their spouse. Frequently such requests are met with astonishment, as if the possibility that a candidate might have a partner who was seeking a professional position were an entirely novel notion. Many potential employers are not of the opinion that it is in their interest to make efforts to assist dual-career couples. This is especially true if they perceive that such assistance is not a prerequisite for acceptance of an offer.

"My manager had felt that it wouldn't be so difficult for my husband to find a job there; he commented that his wife (a stenographer) had been able to find jobs anywhere."

"They said 'there are a lot of potential jobs in this geographic area, she should look for them.'"

"One university simply expressed annoyance."

"At one point the committee stated that they have twice offered positions to women only to be turned down because the university could not accommodate their spouse. So, why were they so surprised and unprepared?"

"He was asked if lack of a job for me would impact whether he came to work for them or not, and because of our circumstances, he was forced to say no. End of help."

Potential employers often not only fail to assist the partners of the candidates to whom they make offers, but may act to make the situation even more difficult by requiring a response to the offer after a time interval which is too short to allow the partner to evaluate the employment possibilities in the area.

(d) Nepotism and resistance to hiring the spouse

In many cases, particularly in geographic areas where there are few employers of scientists, the potential employer may be asked if a position for the candidate's partner

could be found in the same institution. Such a position may be difficult to produce, depending on the partner's field and qualifications, and on the availability of openings at the institution. However, additional barriers may be raised even when such a position is potentially available. Members of the institution may feel such hires are inappropriate in principle, regardless of the partner's qualifications.

"I remember in particular one senior male faculty member telling me how hard it is to get new professors, because so many of them had spouses who were scientists. This faculty member said he was not about to 'burn' a tenure slot just for somebody's spouse."

Or, the institution may generalize inappropriately from a single experience (or even rumor) involving the hiring of both members of a couple.

"At my institution a manager stated that he would not consider dual career couples in his section because it 'always leads to trouble'"

Or, nepotism rules may be invoked to reject such a possibility. This may occur even if the institution does not have such rules any longer, or if they are simply matters of administrative policy (which could potentially be changed) rather than legal restrictions. Whether or not they exist, nepotism rules are invoked far more frequently to forbid the hiring of the woman rather than the man.

"One cited anti-nepotism rules as making it impossible to consider both of us (the rules hadn't existed for years, but apparently the department chair was unaware of this fact.)"

The evaluation of the qualifications of the trailing partner may be colored by the dual-career situation, and the primary candidate may be expected to bear the burden of justifying both positions.

"When my wife received her first job offer, their physics department had an opening for which I was very well qualified. They acknowledged my qualifications, but refused to interview me because they said they were not interested in my research areas. However within the next two years they hired faculty in closely related fields. I am quite convinced that their perception of me as a 'trailing spouse' affected the decision."

"There is a tendency to discount the merits of one [member of a dual hire] on the grounds that 'we had to take one to get the other'"

"There was a great deal of pressure on me to perform enough to warrant two jobs with tenure."

Particularly when the trailing partner is female, potential employers may assume that she is less qualified, or that her ambitions are limited enough that she will accept a position that is beneath her qualifications (or no position at all).

"Most of them assumed that since I am a woman, I should be satisfied with a lesser job. They almost did not take his concerns too seriously. (We both have Ph.D.s from the same university with very comparable credentials.) One of them was interviewing him for a

Asst. Prof. Position and tried to set up a Post-Doc position for me."

"They suggested that I might consider giving up my career."

"One department chair said that trying to find two jobs was a bad strategy and that things worked best if one partner took the best job available and the other stopped working."

"We both made the short lists for several faculty searches. In every case, we told the committee about our situation before we agreed to visit. In two cases, with respect to the male being the candidate, the search committee seemed to indicate that the two-body problem was too complicated for them to solve. In two cases, with respect to the female being the candidate, the search committee said that they were interested in solving the issue, if needed."

The reverse assumption, that a male will not be willing to compromise his ambitions, can be equally inappropriate.

"When I tried to find a job at my wife's institution, the response seemed to be mostly that I would not like it there, although I was well qualified. Not for them to judge, I would have thought."

The availability of a potential position for the trailing spouse may also be affected by departmental (or interdepartmental) politics that have nothing to do with the qualifications of the second candidate.

"Some members of my wife's department tried hard to secure a position for me (also, I had independently interviewed for that slot!) A second slot was rancorously shot down by other departmental factions who viewed it as a threat to their subdiscipline."

"An institution was attempting to hire a high-profile female scientist. Her husband, in a different field, was also very competent and a position was available in that area. The other department was totally uncooperative and felt that the first department was trying to "pressure them." As a result, both scientists went elsewhere."

"The feeling amongst many dual-science-career couples is that the second department often feels put-out at being asked to hire the spouse because it may cost them something in the future. For example, they might not be able to replace the next faculty member that leaves."

(e) Captive spouses and insulting offers

If an institution chooses to offer positions to both members of a couple, often one offer may be for a permanent position and the other for a part-time or "soft money" position. Our survey results and APS statistics indicate that the lower-level offer goes more commonly to the female member of the couple. A promise may be made that a full-time or tenure-track position will become available later, but many times the woman is not given full consideration for the subsequent position because she is perceived to be

"captive."

"Two extremely talented scientists. The husband, a little ahead chronologically in his career, has tenure at a large university. The wife is teaching and doing research at the same university on soft money. Despite her glowing teaching and publication record, she has been constantly passed over on recent job searches. Documents, secretly released to her, seem to indicate the search committee hopes she will just stay, on her soft money 'after all, her husband has tenure. Why waste a real job on her?'"

Or, she may simply be taken advantage of.

"They gave her a desk, and ultimately a title, though no salary (although the university takes overhead on her grants). She is forbidden to use the department secretaries for grant preparation, however."

"She has been an instructor for 15 years now, with low pay and a heavy teaching load, and despite this she has been successful at attracting grants and publishing papers. She recently led a successful fight at our university to win the right to submit grant proposals under her own name rather than having the chair of her department as P.I."

"My institution has a long history of hiring the wives of professors into soft-money positions with no possibility of independent research or of consideration for hiring as tenure track faculty. Every woman who has tenure here has either sued or threatened to sue the institution."

Even if offers of permanent positions are made to both members of a couple, the salary or start-up funds that are offered may be colored by the perception that the couple is in a weak bargaining position due to the dual-career situation. While this perception may be accurate, taking advantage of it is not a way to produce a happy and productive pair of employees.

"Employer made an insulting and degrading offer to my partner, which she was forced to take eventually because there were no other options."

"It is a very bad idea to raise this issue BEFORE an offer is made, since all negotiating leverage for salary and benefits would be lost. At [three prominent universities], jobs offered to us both as a 'package deal' had miserable salaries as a result of their knowing we wanted to stay together."

"I was offered a lower position that I am qualified mainly because they know that it is difficult for a couple to get tenured positions at other universities. In the same manner, I believe that my salary is arbitrarily held low because they know I won't accept other job offers."

[I would like employers to] "offer each of us the same kind of set-up funds that are routinely offered to individuals, instead of taking advantage of the fact that we needed two jobs to get away with offering no set-up funds."

(f) Egregious remarks

The picture of institutional response to the dual-career situation would not be complete without including some of egregiously inappropriate exchanges reported by the survey's respondents. Even more astonishing is the recent vintage of these remarks, which one might have thought belonged to an earlier era in our society.

"One professor suggested to my husband at his interview that one way to solve the two-body problem was to divorce me--not a very sensitive suggestion."

[Potential employer] "told candidate spouse shouldn't be working anyway."

"One suggested that I should be available to do "volunteer" scientific work, because it was my partner's role to support the family."

"I was told that I should be able to find a lab to work in, as long as I was willing to change fields and didn't expect to be paid; if I 'needed to be paid' I might be able to teach introductory calculus."

"Her last request for a raise was met with the response that she didn't need a raise because her partner was well-paid as a full professor."

(g) Conclusions

In this section, we have given dozens of specific quotes from our survey respondents. A reader of these comments might imagine that they occurred decades ago, and are not likely to be repeated today. However, we have analyzed the ages of these respondents, and found that virtually all of them are in their 30's or early 40's—these quotes are current, and represent current institutional practices.

How can one respond to these attitudes and practices? To some degree, one is dealing with societal prejudices, which will not easily be changed. However, there were a number of positive responses and suggestions discussed by survey respondents, and they give some hope. As the number of women in physics grows, these prejudices should fade. In the next section, we will look at many of these suggestions.

V. SOLUTIONS---POSITIVE RESPONSES AND SUGGESTIONS

One of the primary purposes of our survey was to look for interesting solutions and innovative responses to the problem. Despite the gloomy picture painted in the previous section, such responses do exist and can be used as models by institutions that wish to take a positive approach to the issue. It is important to emphasize that there is no magic answer to the dual-career-couple problem; there were almost as many different situations as there were respondents, and each of the various solutions discussed in this chapter will

only apply to a subset of these situations. Some of these solutions involve formal institutional responses to the problem, while others are more *ad hoc*.

In spite of the large number of different dual-career couple-situations, they do tend to fall into several broad categories. Either the members of the couple are in the same scientific field, or they are in different fields. Either they are at a similar stage in their careers, or they are at different stages. Either children are (or will be) a major factor, or they are not. The various suggestions in this chapter will generally only apply to certain groups; split/sharing positions, for example, will not generally be relevant to those in different fields or at different stages in their careers; some of the ideas for commuting will not be practical for those with children.

Nonetheless, there were some interesting ideas discussed by survey respondents and many people might find some linear combination of these ideas to be applicable to their situation. We hope to convince the reader that the dual-career couple problem is not always hopeless, that institutions and couples have come up with innovative and interesting solutions, and that the problem can be dealt with at all levels of the profession.

(a) Shared or Split Positions

(i) What are shared or split positions?

Perhaps the most difficult dual-career couple problem occurs when both scientists are in the same discipline. Jobs in physics are very rare, and the probability that two jobs which match the partners' subdisciplines will occur in the same department is very small. In the words of Montgomery and Powell[2], "if you have the same level of training in the same field of study, then don't expect to have the same zip code". A solution which is being increasingly adopted involves shared positions (also called "split" or "joint" positions, although there are important distinctions between them which will be discussed later). Shared positions began at colleges and universities in isolated areas (since there were so few alternatives for spouses), but their popularity has been growing rapidly in recent years, and they are now becoming common at major research universities.

In a shared position, a single faculty position is shared by two individuals. Each has half of the duties of a full-time position. There are many issues in such an arrangement, including conditions of tenure and promotion, merit raises, benefits, start-up funds, voting rights, etc., and a number of different ways of dealing with these issues--they will be discussed in detail below.

The first reaction that many couples have when first considering a shared position is "No way!" From a financial point of view, sharing a salary seems no better than one partner having a full salary and the other being unemployed. There is also concern about the "two for the price of one" syndrome--it is unlikely that an academic who is paid half of a

salary will actually spend only half as much time as full-time academics. Thus it appears to be much less money for a lot more work.

In practice, however, the financial situation as not as dire as it might seem. The single salary only applies to the academic year--if both partners have research grants, and can get support during the summer, the total annual salary can reach 1.25 person-years. In addition, the half teaching loads frees up a lot of time in which additional compensation can be found. For example, most large departments have people on leave every semester, and so extra teaching can be done. By offering to pick up extra courses to teach, many couples can earn an additional 1/4-1/2 of an annual salary. There is also more time for consulting and outside employment.

But the main advantage to sharing a position is the additional time freed up for other pursuits. This is useful for those wishing to establish stronger research records, and is especially useful for those wishing to have a family. This advantage was described very nicely by Jane Lubchenco and Bruce Menge, who shared a position in biology at Oregon State University ; their positions were eventually converted into two full-time positions. Dr. Lubchenco, who was President of the AAAS in 1996, says[3]:

"We both wanted to have a family but had difficulty imagining when we would be able to squeeze in enough time with our children. We both wished to be active participants in raising our children and to spend significant amounts of time with them. However, neither of us wanted to give up teaching or research. Moreover, we understood that traditional part-time positions in academia take scientists out of the mainstream with little opportunities to reenter. We wanted to have it all but not go crazy in the process. We sought not what later came to be called "the mommy track" in which career goals would be sacrificed, nor the so-called "fast track" which we were already on and for us would have precluded having sufficient time with our children, but rather what we intended as a "sane track". The ideal arrangement seemed to be one in which we could each work part-time but do so in mainstream positions."

In our survey, we found several couples who had high praise for the way in which their shared positions were working, and none who complained about them. There were also many situations described by respondents whose problems seemed amenable to the "shared position solution", but they didn't seem to have considered the possibility.

We will first look at the advantages and disadvantages of shared positions, and then look at the mechanics of shared positions and how issues such as tenure, benefits, raises, funding, office space, etc. are dealt with, several specific examples (including examples of formal "shared position policies") and contracts, and finally look at our survey results and the question of how to obtain such a position.

(ii) Advantages and disadvantages of shared positions

Here we discuss the many advantages (and few disadvantages) of shared/split positions. Many people in such positions rave about them, write articles about them, and spread the gospel about how wonderful shared/split positions are. In our survey, we found much support for these positions, and not a single negative report.

Shared positions are best for two people in the same field, at roughly the same level of training. In many cases, they provide the only mechanism for both partners to stay active in science, in mainstream positions, and still live together. When a position arises in a department, there is generally only one position available, and so a spouse will come along, often without support. The trailing spouse will often be able to play some role in the department, as a part-time instructor or post-doctoral associate. But part-time, non-tenure track positions are dead-end positions, without much future. Advancement in academia progresses in very specific steps, and it is hard for someone "off the track" to get back on. Thus, by splitting a position, both partners can be in tenure-track positions, continue to teach and to do research. It may very well be possible for the half-time positions to evolve into full-time positions in the future

However, the main appeal of split positions was described in the quote of Lubchenco in the last section, in which she noted that she could avoid the "mommy track" and the "fast track" by getting onto the "sane track." Lubchenco and her husband, Bruce Menge, were one of the first couples to obtain a split position (at Oregon State in the mid-70ís). They both had assistant professorship positions in Boston (his at U. Mass, hers at Harvard), and gave them up for two half-time positions. This enabled them to play a much more intensive role in raising their children. Natalie Adolphi and Andrew McDowell share a position at Knox College. The flexibility of the position is its most attractive aspect, Adolphi notes[4], "for us, it was the freedom to define the job to be whatever we wanted. We have a young daughter, so we have time to spend with her. Also, we're only starting our teaching careers, so we're not too efficient yet. It's nice to have extra time to prepare." They share a research lab, but each works on a separate line of research.

Carol and Andrew de Wet share a position in geosciences at Franklin & Marshall. They note[5] that “The split position is an attractive option for balancing the demands of both career and family, particularly during the pretenure, preschool years." The de Wets have been very happy with their split position. It is providing "students with positive and alternative role models; they see an equal division of teaching responsibility, research, student interaction, and time with our children.... we show, by example, that women can have both a fulfilling family and a successful scientific career, thereby encouraging our female students to continue with graduate study..." Carol de Wet recalls from her undergraduate years: "A renowned female professor from a high-caliber university gave a professional talk as a visiting speaker. She offered to answer questions about careers. Someone asked her about her career decisions and she stated, quite unequivocally, that it was impossible for a woman geologist to have a career and children. She opted for the career. We hope we can demonstrate another option."

There are also major advantages to the institution. For the price of one (or slightly more) faculty member, it can employ two people. As noted by Lubchenco and Menge, "Two individuals bring two different ways of thinking, two different backgrounds, two different approaches, multiple skills, and generally much greater richness of experience than would be possible with a single individual". The advantages to a small department of such a situation are clear. In research-oriented institutions, there will be two people who can obtain funding, and summer salary, increasing the total departmental funding. Lubchenco and Menge also argue that "an additional, but unexplored advantage might be

that individuals who work only part-time while their children are young may be less apt to suffer professional burn-out". Two people in a split position are much less likely to leave: as noted by Mark Schneider, Chair of Physics at Grinnell, "offering shared positions adds stability to the faculty and reduces our difficulties due to attrition". Perhaps more importantly, the effect on students, especially female students, can be electrifying. It provides them with alternate role models--they see that it is possible for a couple to have both a family and two productive, exciting scientific careers.

The primary personal disadvantage to a split or shared position, of course, is financial. As noted above, supplemental income can be obtained through summer salaries, extra teaching and outside consulting; and much money can be saved by not needed full-time child care. Nonetheless, two full positions will provide a significantly higher income. Another disadvantage, noted by the de Wet's is "the strong personal tendency to do more than the agreed-upon part-time work, and the (usually unintended) external pressure to assume that more can be done than the agreed-upon work load. To counter this the split position faculty may need boldness to speak out when the workload goes beyond reasonable levels. There is, however, a fine line between being exploited, and being willing to accept some amount of overload as compensation for both partners being employed in the same place in a highly competitive job market."

In Box 1, we have summarized the advantages and disadvantages of shared/split positions, for the individuals and for the institution, as well as the potential stumbling blocks involved in obtaining such positions.

**********BOX 1**********

Individual	Institution
Advantages	
Both can stay active in science, continuing research and teaching	Attracting two faculty, with varied backgrounds and experiences, for the price of one.
More time for child-rearing	Extra research funding possibilities
More flexibility with scheduling; the "sane" track	Faculty likely to stay; stability and loyalty
Ability to supplement income with teaching, consulting, etc.	Role models for female students, showing how to combine family and career successfully
Disadvantages	
Financial--generally less than 2.0 salaries	Additional administrative burden
Need to be assertive to avoid exploitation	

Obstacles

Lack of knowledge of shared positions	Institutional ignorance
	Bureaucratic inertia
	Nepotism rules (in some states)

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(iii) How do they work?

Shared and split positions are similar in that a single FTE (full-time-equivalent) nine-month faculty slot is occupied by two individuals. In principle, however, they are very different. In a shared position, a single position is shared by two people. This one position is considered for tenure (either both get tenure or both do not) and promotion, a single salary increase applies to the position and the salary is divided evenly, the two individuals can negotiate the division of responsibilities. In a split position, a single position is divided into two separate, independent, half-time (0.5 FTE) positions. Each half-position has a separate contract to do half the teaching, research and service, each is eligible for tenure and promotion independently, each receives a separate raise, each has separate benefits (note that half-time positions might not be eligible for full benefits).

The differences between shared and split positions can be quite significant. Each has different advantages. In a split position, the independence of the two positions lead to much greater flexibility in research, as each partner can pursue separate research goals, and dividing up the responsibilities of a single position is not necessary. In a shared position, dividing the responsibilities can be an advantage--if one partner wished to take some time off (to rear an infant, for example), the other can take on full responsibility for the position.

In practice, we have found that split positions are much more common than shared positions. However, there is a significant variation in individual contracts, and many arrangements that dual-career couples have made with their institutions have aspects of both types of position. In some, for example, each member of the couple in a shared position is evaluated separately for tenure (as in a split position), but if one is denied tenure, the other can convert their half-position to a full-time position. We will now give a number of examples of such positions, including explicit examples of formal "shared-position" policies at some colleges and universities.

With a total faculty of approximately 100, Knox College has 5 couples in shared positions. Natalie Adolphi and Andrew McDowell share an assistant professorship in the Physics Department. Their position is a shared position; McDowell comments that[6] "Each of us is evaluated (for tenure) independently, but both of us must be deemed tenurable for the shared position to continue." If one of them does not receive tenure, the college will declare the position open, and the tenurable spouse would be free to apply for the opening as a full-time person. "After tenure, if one person leaves, the other person assumes the full-time position as the first option". They receive the same benefits for the family that one full-time person would receive.

Adolphi points out that a major factor in their success in obtaining this position was the

fact that Knox had an established policy on shared positions before they even applied for the position. "If an administration hasn't yet decided on a policy, convincing them to come up with one in the midst of a job search will undoubtedly be quite difficult. ('What if they get divorced?", etc. '). The easy way out for the administration is to simply say no, even if the department is extremely keen on the idea of a joint position". She urges people to urge their institutions to develop such policies before the job-searching season begins. Knox College's Policy on Shared Appointments is given in Appendix B. It has been quite successful to date.

Note that there is no explicit requirement that the participants in a shared position be married, although that has always been the case to date. In addition, there is the presumption that both participants are in the same department. In general, shared and split positions are only feasible when this is the case--we know of no counterexamples.

The Adolphi-McDowell position is an example of a "shared position". Split positions are much more common. It is difficult to find formal policies regarding split positions. Many institutions, such as the College of William and Mary, have a number of split positions. However, the institution is reluctant to "lock in" a formal policy, since that would make it more difficult to be flexible (some positions are 60-60, some have different benefit policies, etc.). Rather than adopt a specific structure, they rely on the fact that they have a number of such positions to provide templates for future hires. Unfortunately, in some institutions there are formal college policies which forbid tenure for part-time positions, and split positions are thus not allowed.

As an illustration of how a typical split position works, one can look at the position held by Carol and Andrew de Wet, who are in the department of geosciences at Franklin and Marshall. In a recent article in the Journal of Women and Minorities in Science and Engineering[5], they described the position. The description is given below:

"We currently split a tenure-track geoscience position at Franklin and Marshall ... We are now in our fourth year toward tenure (this was in 1997) ... and have two preschool-aged children and one other in school ... The College provides us each with an office, laboratory space, computers and telephones. We received generous start-up financial support and have been fortunate with the acquisition of new equipment. In addition, we each have internal funding for attendance at professional meetings and discretionary faculty development monies, equivalent to one full-time appointment. We can both apply for in-house grants for student research funds, course innovation and other professional expenses as though we are individual, regular faculty members. We each have a full vote in college faculty meeting and a half vote in departmental matters. We both serve as premajor advisors and serve on college committees. ... There are a number of options concerning tenure, and policies tend to be institution-specific, negotiated by the split position faculty and Dean or other administrator. Our contract states that we will each be evaluated for tenure as separate members of the faculty. The expectation is that we will demonstrate the same quality, but half the quantity of work, as our peers. If we both get tenure, then the situation remains unchanged. If one gets tenure and the other does not, the successful one can stay on as a half-time faculty member. At that point, the college may open negotiations concerning the position's extension to full-time."

Mark Montgomery and Irene Powell have a split position in Economics at Grinnell, which allows them to supplement their income with extra teaching. They described their position in the *CSWEP Newsletter*[2]: "We each represent between .7 and 1.0 associate professors at Grinnell, with an annual mean of .9 and a standard deviation of about .1 (this is not something we try to explain at cocktail parties). Our joint contract stipulates that we teach no fewer than seven courses between us per year, and up to ten if we and the college mutually agree". In Appendix C, we show their contract arrangement. They also noted that when they began, "Grinnell insisted that we be paid identical salaries, prorated by the number of courses we taught. As it happened, one year Powell ranked 5 on the merit scale, while Montgomery ranked only 3. So they averaged and gave us both a rank-4 raise. As a result, Montgomery became professionally jealous of Powell and Powell began to think of Montgomery as a drag on her career. Recent reforms made it possible for a couple at Grinnell to opt for separate salaries. For us, financially, this should be very worthwhile since those divorce attorneys cost a fortune." Thus, their position had aspects of a shared position (equal salaries), but has evolved into more of a split position.

Split positions are much more common than shared positions. In discussions with various college administrators, the most serious concern about shared positions is the "all-or-nothing" aspect of the tenure decision. It could turn out that one member of the shared position is very good, and the other is very poor, putting the institution in a very difficult situation. As a result, many so-called "shared positions" treat tenure as if it were a split position (with each person evaluated independently).

In an article in *Geosciences Canada*[7], Catherine Shrady surveyed nine institutions with shared/split positions in the geosciences---Albion, Colgate, Franklin & Marshall, Hamilton, St. Lawrence, Vanderbilt, Michigan Technological, Cornell and U. Mass Amherst. 6 of the 9 defined the position to be a "split position" (4 were 50-50, 1 was 60-60 and 1 was 75-75). The other 3 defined the position to be a "full-time shared" position. However, these 3 "shared" positions had the same basic tenure policy as the split positions---each member is considered separately, with the position to be renegotiated should only one member be denied tenure. All of them provided full office space. They had a variety of voting rights policies--most gave each member a full vote in both university and departmental matters, one gave each member a half vote in departmental matters and another gave each member a half vote in university matters. They each provided full travel funds and (with one exception) allowed each member to apply for university grants as if they were full-time. There was a fairly even split as to whether start-up funds were shared. Benefits are an important, and often contentious issue, since part-time employees generally receive limited benefits. All the institutions offered full medical benefits for both partners, and at least offered them each one-half of the "other" benefits (such as life insurance, pension, and tuition exemption for children). Some were more generous.

One can see that the distinction between shared and split positions is narrowing, especially concerning tenure. In recent years, the number of these positions has grown to the point where their novelty has worn off, and they are becoming part of the standard menu of options for those seeking positions in academia. Yet our survey showed that a large number of dual career science couples seem unaware of this possibility. To remedy

this situation, we have constructed a special Web site, which we hope to link to the APS Home Page which will give many details concerning shared and split positions. The page can be found at http://www.physics.wm.edu/dualcareer.html. We will invite couples in such positions to visit the site and to submit information about their positions. Dual-career couples and institutions who would like to investigate the possibility will then have many examples to show administrators, thus helping overcome administrative inertia.

(iv) Survey results

Several of the survey respondents discussed their split or shared positions, and a couple provided e-mail addresses so that we could contact them and get their "shared position file" of information (we are especially grateful to Natalie Adolphi for providing us with a large number of articles dealing with these positions). There were some who had heard of such positions ("a friend of a friend ..."), but didn't know much about them. We were surprised by the general lack of information about split positions among the respondents. Following are some of the comments:

"It would sure be nice if teaching and/or research positions at colleges or universities could be split between a couple. I have some friends coming out of grad school soon, with both in physics, who would make a great addition to any faculty as a pair. She does not want to work full-time, but still wants to stay in physics at some formal rank. He wants to work full-time, but still have as much time with their children as time allows."

"Splitting a faculty position is widely mentioned as an option, but we have found very few institutions willing to do this. No state institutions that we have had contact with have been able employed full-time), and even most private institutions are unwilling (they are nervous about tenure issues...)."

"When we originally applied for shared positions at several places, we were told that they did not know how to deal with issues such as health benefits, tenure, etc."

"Part-time or joint appointments at an undergraduate institution would be appealing to us, but it seems that they are not feasible due to the tenure situation. It doesn't seem realistic for a school to give a joint tenure to two people who have only shown up for half a day of work each. I am sorry that we do not fit neatly into the two-career category since we have made choices that lead us to only one career. "

"My husband's potential employer rejected the suggestion (of a shared position) because there is no previous example, and they are not ready to set an example."

"I have not found much positive in our search for a 50-50 position. The most positive thing I can mention is that there are occasionally advertisements for dual career couples. But these are very rare, and we have never been interviewed for these positions."

These respondents certainly know about the possibility of split positions, but seem less aware of how common they are. The last comment gives a clue as to the best way of

obtaining a shared or split position. Seldom do institutions advertise for a split position--they generally arise in response to a search for a single position.

This leads to a crucial question. When is the best time to discuss the possibility? Our respondents seem divided on this question. Elsewhere in this report, we point out the serious problems that can occur by mentioning one's spouse's situation too early in the search process, and argue that it is generally best not to discuss the matter until after the interview process. Split positions are different. If a couple is set on such a position and would not accept anything else, then one should bring it up early, possibly in the initial application. After all, it is a condition of employment, and is only fair to alert the employer at an early stage. In mentioning the position, however, it would help (if the institution does not already have one or more split positions) to make a specific proposal--or give some explicit examples--thus showing the institution that these positions are feasible and not uncommon. On the other hand, in many cases, the couple is not specifically set on a split position, and is willing to consider other options. In that case, it is probably not best to mention it too early in the process (although waiting until an offer is made might not give the institution time to respond). Alas, there do not seem to be any hard and fast rules for when to bring up split positions.

There were also several respondents whose situations seemed very amenable to a shared/split position, but they seem not to have considered the possibility:

"I think the chair could have gone to the Dean and said that they had a chance to hire a women physicist (dept. was all male), but she only came as a couple and another position would have to be found."

"Several places interviewed both of us if the institution wanted one of us. Ultimately, however, we did not both get offers from the same place. In the end, it made no difference to the employer that we were dual-career. People at labs and universities were sympathetic, but unable to help (i.e. make two offers, or assist the second person in finding a local job). There was no motivation to assist us because of the funding/job crunch in the physics job market.. (That is, either we accepted one position and dealt with the problem on our own, or we turn down the job and the institution offers the position to one of the other 199 good candidates)."

"We decided that we may want to have children, and that if so, we would want to be at the same place. Since I had the more promising academic job at the time, my wife chose to take a lesser (and temporary) academic position where I was so that we could live together."

"Later, we were both in temporary teaching jobs and did job searches...when my husband was offered a tenure track job (and I was not) we moved to the city in which he was offered a job. Because we plan to have children, I have restricted myself to working in this geographical area. I am currently teaching part-time, but have not figured out how to advance my career and leave flexibility for having children."

We see that a major problem with split/shared positions is that people don't know much about them. On the dual-career-couple Web page that we are establishing, we will

present a number of examples, strategies, etc., and will invite couples with such positions to add to this number. Over time, the database will make it clear how common such positions are, provide templates for couples to suggest to institutions and for institutions to establish clear policies, etc.

Shared/split positions are not for everyone; they generally require the couple to be in the same department, and to be at roughly the same point in their careers. For such couples, however, they can be a godsend, allowing both people to maintain active, productive careers without sacrificing their family lives. The "sane track" can be a welcome alternative to the "mommy track" or the "fast track".

(b). Spousal Hiring Programs

Shared and split positions are a potential solution for couples in the same department, however, in the majority of cases, a dual-career couple will be in different fields. Many institutions have recognized that the dual-career couple problem makes hiring more difficult, and have established formal spousal hiring programs. The checklist for the Spousal Hire Program at the University of Wisconsin-Madison says, in its preamble:

"Increasingly, University professionals are part of dual career couples. Thus, decisions to accept a University position are often made based on the availability of employment for a spouse or partner. The following steps [described below] are provided to assist departmental chairs and other administrators in arranging a needed spousal/partner hire. The spouse may be hired as faculty, academic staff, or classified staff. The terms used apply to a spousal hire within an academic department. (The process is analogous for spousal hire in administrative and support units: substitute "supervisor" for "chair"; "unit" for "department", "director" for Dean, etc.)"

This makes clear that spousal hire programs do not just apply to situations in which both persons are ready for faculty positions, but also to cases in which one member of the couple is not suitable for a faculty position but is qualified for an academic or classified staff position. In this section, we will discuss these programs as if they were both qualified for faculty positions, however one must keep in mind that they also apply much more generally. Many institutions have programs that assist in finding non-academic positions for spouses, and they will be discussed in section (d).

How do spousal hiring programs work? Typically (and there are wide variations), the spouse's salary is split, with 1/3 coming from the original hiring department, 1/3 coming from the spouse's department, and 1/3 from the Provost's office. This arrangement lasts for a number of years (usually three to five, but sometimes permanently), and then the spouse's salary comes entirely from his/her department. Many institutions have these programs; our survey respondents mentioned programs at University of Wisconsin, UC-Davis, Purdue and the University of Illinois at Urbana-Champaign. We now describe these programs briefly.

The program at UW-Madison was established as part of a five-year Faculty Strategic Hiring Initiative, and was designed "to support a faculty, academic staff, or classified staff position for the spouse/partner of a new faculty member". The funding arrangement

mentioned in the above paragraph is in place for three years, after which the spouse's department assumes full responsibility. This funding arrangement assures "quality control", since it is unlikely that a department would hire someone who is not appropriate for a mainstream faculty position if they will be providing funding for 27 years of the typical 30-year faculty career. It is particular advantageous if the spouse's department anticipates retirements within the next few years.

UW-Madison's procedures for a spousal hire are given on page 25 of the Search Handbook, at <http://www.wisc.edu/ohrsbkmainwfrm.html>. The Chair of the department interested in hiring someone with a spouse/partner who needs an appointment initiates the process, contacting the unit or department that might provide such an appointment, and (if both departments or units are in agreement) goes to the Dean's office with a formal proposal. Special funds are available for start-up packages, if needed. The department hiring the spouse can get a formal waiver (to hire someone without a formal search) from the Office of Human Resources. The offer to the spouse is contingent on the first hire's acceptance.

We have discussed elsewhere the difficulties involved with asking a candidate about their spouses. So how does Wisconsin bring the program to the attention of a candidate, without causing these difficulties? They have a sheet on "Some 'Best Practices' for Spousal Hiring" that explains how they inform candidates--we have copied that in Box 2.

**********BOX 2**********
The Search Committee seeks the best person(s) for the job, without respect to whether a candidate has a spousal hire need.

The Search Committee nonetheless remains alert for the possibility of a spousal hire need and conveys signs of that need to the chair as soon as possible.

When should the Search Committee raise the issue of spousal hire?

There are two particularly good points to make a statement: (1) in the letter that invites an interview (making the same statement to all interviewees, (2) in the interview (making the same statement to all interviewees.

What can the Search Committee say to the candidate about spousal hire?

"UW-Madison has a Spousal Hire Program that can, in some cases, facilitate a hire for a spouse or partner. [If you become a finalist for the position], feel free to raise the question of employment options for your partner or spouse if this would be a factor in your decision to accept an offer".

What should the Search Committee not say to the candidate about spousal hire?

"Spousal hires never work"
"We cannot arrange a spousal hire"
"We are looking for a candidate who does not have a spousal hire need"
"We will certainly be able to arrange a spousal hire for your spouse/partner"

What should the Search Committee not ask?

"Are you married"
"Will you need a spousal hire for your wife? husband? partner?"
"Would you accept an offer from us if it did not include a spousal hire?"

What can the Search Committee ask?

"If we were to offer you this position, are there factors other than the ones we have discussed that would be important to you in weighing our offer? Can we provide you with more information about any such factors"?

Once it is clear that the finalist for the position has a spousal hire need, the chair follows the "check list". The chair assumes the primary responsibility for achieving a spousal hire, although parts of the process may be delegated. The chair makes many contacts and knows when to call a meeting of the key players. The chair feels no embarrassment about approaching other chairs, the dean or other administrators for help, because each successful hire is a success for the university
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The procedure described seems optimal. All candidates are treated equally, and the candidate must be the one to bring up the issue of a spouse. The Program has been quite successful to date.

At the University of Illinois, there is a Dual Career Couple Program. It is aimed at "enhancing the ability of the campus to recruit and retain faculty members when the appointment or retention of one person is contingent upon employment of another. The program recognizes that the Champaign-Urbana labor market, compared with those where many peer universities are located, offers limited employment opportunities for a faculty member's partner. The result is that UIUC is at a competitive disadvantage in the recruitment and retention of faculty. The Dual Career Couple Program addresses this problem by provided a waiver of search and by allocating resources to the unit that hires the accompanying partner".

The procedures are similar to that of Wisconsin. The executive officer of the first unit is responsible for contacting the appropriate unit for possible employment of the partner. This executive officer must provide justification to appoint the partner in order to successfully recruit/retain the faculty member and must be willing to provide 1/3 of the salary of the partner. The executive officer of the second unit must be able to justify the appointment on the basis of legitimate unit needs and the candidate's qualifications, and must be willing to support 1/3 of the partner's proposed salary. Upon approval of a proposal from the two units, the Provost will provide a waiver of search and the remaining 1/3 of the partner's salary. Nominations are accepted for tenure track and tenured faculty prospects. Although the policy is geared to appointments to the faculty, requests for partner appointments to academic professional positions will be entertained.

At UIUC, the salary arrangement is permanent. Research funds can be requested. For

positions other than a faculty position for a spouse, an office on the campus assists the Dual Career Couple Program in finding suitable employment.

Purdue University has an extensive Spousal Relocation Assistance Program. This is designed to find spouses of newly-hired faculty employment in the area. An evaluation of the program recently noted "The existence of a Relocation Assistance Program serves to humanize a university. Such a program tells the world that Purdue recognizes and understands the needs of the whole person and is concerned with more than just the skills and expertise of that individual ...We believe that programs of this type are necessary in a competitive environment and a worthwhile expenditure of funds ... To be competitive, we need to be viewed as a family friendly employer, sensitive to the difficulties of relocation ... From a recruitment standpoint, it can help with meeting minority and female hiring goals and create a more diverse work force. From a retention standpoint, we know that the primary hire will only be comfortable if the accompanying spouse is happy with his/her situation ..."

The office has a permanent half-time staff member, who actively helps spouses find positions. Every year, they have successfully placed approximately 50 spouses of newly-hired faculty or staff. This program is somewhat different from those at Wisconsin and UIUC mentioned above in that they do not deal with assisting spouses of newly-hired (or newly-offered) faculty in obtaining a faculty position, but do help them in obtaining other University positions (see section (c)). For those looking for a faculty position as well, Purdue has a "Spousal Bridge Program". The program is described as follows:

"To help academic departments recruit and retain dual-career couples when both spouses seek faculty positions, Purdue established a Bridge Program in 1992. The program's intent is to achieve partnership between the academic department hiring the recruit and an academic department that would be appropriate for the accompanying spouse. The administrator responsible for hiring the recruit can attempt to locate a partnership with an appropriate department for the accompanying spouse. When an appropriate academic department wants to consider hiring the accompanying spouse but needs assistance, the academic departments and schools work in partnership to try, in some cases, to achieve an appointment for the spouse of a recruit. In certain situations, the Executive Vice-President for Academic Affairs also provides assistance through a special Bridge Program. The Spousal Bridge Program is also available for one academic department when both spouses are in the same discipline."

This is, of course, considerably more vague than the programs at Wisconsin and UIUC. Many institutions prefer to be deliberately vague, to allow for more flexibility of action. There is some tension here. It is important for institutions to have some specific policy or program in place, and to be prepared to deal with dual-career couples; yet too much specificity can constrain the institution and make it difficult for them to be flexible.

At the University of California, Davis, there was a policy several years ago that the university should assist partners and spouses find employment. However, there was no formalized method for finding or funding partner employment, and UCD realized that it were losing potential and current faculty because it was unable to effectively implement this policy. So, in 1996, the Partner Opportunities Program was started to address this

issue. Each year, it works with approximately 100 spouses and partners.

The Program assists partners/spouses in finding academic and non-academic positions. In the case where the Program feels that the partner/spouse should be considered for a UCD faculty position, the appropriate dean and department chair are contacted and asked to review the CV. If there is the possibility of a position, the Program arranges for the partner/spouse to meet with the dean and chair. Partners/spouses being considered for faculty positions go through the regular faculty appointment review process. They find that having a central office to handle these placements is very effective. Even in the case of same department appointments, the Program often provides funding; when successful recruitment or retention involves two different departments, the Program can work to make sure that all parties know what is happening and assist in authoring agreements. Assistance in funding is done on a case by case basis with sensitivity to department funding issues. The Program has bridging funds available with a negotiated term of 1-3 years. In most cases, the Program pays only a part of the salary with the faculty member's department and the employing department paying a share.

This program does define "partner" as domestic partners who are the same or opposite sex. Our survey did not elicit information about the additional difficulties of same-sex partners, which can be quite significant (most states will not recognize them for standard family benefit packages). Only four of our 620 respondents said that they had a same-sex partner.

Perhaps one of the most important things that spousal hiring programs can do is to provide bridge positions until the next retirement occurs. This can get around the difficulty that so many dual career couples have in timing. Often the department appropriate for the spouse will be interested in hiring him/her, but will not have a position (or at least a position in the spouse's subfield) that year. If a bridge program can provide funding until a particular retirement, then this difficulty can be alleviated.

We see that spousal hiring programs can be of great benefit to dual-career couples. Note that all of the above institutions are large universities. Only such institutions are large enough to justify having special offices dedicated to spousal hiring programs; only at large institutions can special funding be set aside for bridge positions. In many cases, smaller institutions simply don't have the resources. A possible solution might involve a federal program designed to support bridge positions. For an investment of a couple of years of salary, such a program could "save" a scientist's position for a lifetime.

(c). Alternative Positions (academic)

Although split/shared positions and spousal hiring programs can be invaluable for couples who are both at the same stage in their careers (and both ready for faculty positions), a more common situation occurs when there is a disparity in either the respective stages of their careers, or in their respective talents.

One of the problems is that there usually is an imbalance in talent and/or years associated with the two-body problem. As an example, we can cite the situation of one of the authors of this report. As a faculty candidate, the author was about 4 years further

advanced in career than the spouse. The author managed to get a job at a reasonable institution, but the spouse is still at the postdoc stage of establishing credentials within the physics community, making it hard to ask the institution for anything at the present moment.

This problem is especially acute for women, who typically have older spouses (in our survey, the mean age difference was 2.1 years); the male partner will typically be further along in his career, and thus when the two-body problem strikes, she is more likely to lower her expectations.

When neither member of the couple is being considered for (or has been offered) a faculty position, it is unrealistic to expect institutional assistance. Nonetheless, individual faculty members can be of great assistance:

"Since I was offered a postdoc fellowship to work with a particular person, I contacted my potential boss. He, as an individual, responded by giving us names of friends and colleagues to contact about possible jobs. He also contacted some of those people for us to set up exploratory appointments during one of our visits to the University. The director of the Dept. contacted several other department heads on campus to see about appropriate openings. Several other faculty members gave us names of contacts and suggestions for finding information/job openings. Each time I asked for help, a bit more effort was put into finding my partner an acceptable job. In the end this paid off, since a positions was created for him by the University."

The moral of the above story is "ASK". Even though one partner is only coming for a two to three year post-doc, it can often be very productive to ask the supervisor for assistance. Universities have a number of soft money positions (teaching and/or research), and there is much less difficulty in getting a two to three year position for a spouse than in getting a tenure-track position. Of course, the position that the spouse obtains may not be the best for his/her career. He/she will then have the choice of taking a position that is not the best from the career point of view, and living with his/her spouse, or taking a better position, and commuting. In the next section, we will discuss various ideas to make commuting somewhat more palatable. In any event, any separation would be for a limited period of time.

Of greater concern is the situation when one spouse obtains a faculty or other "permanent" position, and the other can't get something similar. This is the situation that causes more physicists, especially women, to leave the field. It will occur when the two are at different stages of their careers, when the "trailing spouse" is either not qualified for a long-term position or has research interests that don't match the needs of the institution, or when the institution has a hostile or indifferent response to the needs of dual career couples (as described in the last chapter). Possible positions available include short-term (2-3 year) postdocs, soft money research positions, and adjunct or part-time teaching. Each of these will be discussed below, but it must be emphasized that there is no general procedure for arranging such positions. Thus it is difficult for couples negotiating with an institution to know what to expect or even what they can ask for.

Short term postdoctoral research positions for a "trailing spouse" are (at research

universities) not particularly difficult to arrange. Assistance from the administration can generally provide full or partial funding for a couple of years. Many of our respondents were able to get such positions. Of course, the obvious question is: what happens when the postdoctoral position ends? At this point, the department will be aware of the research potential of the "trailing spouse"; if he/she has been wise enough to volunteer to teach a course or two, they will also be aware of the teaching potential. Assuming these are good, then they will have a strong incentive to create a tenure-track position, in order to avoid losing both partners. In many cases, our respondents "solved" their two-body problem in this manner. The details varied--some only had part-time positions for a couple of years, for example--but the basic pattern persisted.

"Initially for the first five years I had a part time job at the University and therefore our department knew about my teaching and research abilities. Thus when they had an opening for a tenure track position they hired me."

"The institution was very helpful. They spoke with my partner's department to locate a part-time position. This turned into a full time tenure-track later on."

"I was in serious contention for a faculty position at XXX, and I asked about opportunities for my husband. XXX and YYYY (another university where he had a postdoc at the time) worked together to arrange a visiting appointment for my husband at XXX., and I accepted a "permanent" position. After a few years of visiting and short term appointments here at XXX, my husband now has a "permanent" faculty position here as well. In all cases, people have done as much as possible to support our dual career situation. It has been nerve-wracking, to be sure, but we have been most fortunate."

It is advisable, BEFORE the original offer is accepted, to learn about future hiring plans for the department. If no hire is expected in the trailing spouse's subfield for many years, then this should have an impact on whether the offer is accepted. Of course, even if a hire in the subfield is possible in the next few years, no institution would (or should) be expected to make any promises about that position.

Since the job market is so tight, it may very well be that the spouse who gets the offer has no real choice but to accept it, and that the prospects for a tenure-track position for his/her partner are very dim. In that case, one can still consider long-term soft money positions. Many research groups do have very long-term positions, which can last for decades (this is especially true of high energy physics groups, where experiments can last for half a career). There are also positions involving systems management--one respondent got a "permanent" position which was half-time research and half-time managing the departmental server.

A study[8] of SMR's (Soft Money Research Positions) was carried out in 1993, and involved 69 universities (primarily research universities). An SMR is defined as a position in which all of an individual's salary comes from grants or contracts rather than the institution, although the institution might provide initial funding for a year or two while grant support is sought. For the overhead funds, the institution provides all of the support generally given to tenure-track faculty. SMR's can often parallel the standard tenure track (going from "research associate" to "research assistant professor" to

"research associate professor"). Institutions vary widely in whether SMRs can vote in faculty meetings, serve on dissertation committees, and teach courses. Most institutions have formal policies about SMR's. In the above study, 40% of the SMR's at the universities were spouses of tenure line faculty, and three quarters of those were women.

Although SMR's do have access to research facilities (although to a somewhat lesser extent than tenure line faculty), the above study cautions about the psychological stresses of these positions. "The stress of the difference in status between their positions and those of regular tenure-track faculty, can further reduce research capabilities. SMR's can be especially stressful if there is a sense of entitlement or expectation that is not matched by institutional actions. As one respondent noted verbally, it is very hard not to take personally the lack of institutional recognition. These stresses can become exacerbated for many academic couples because differences in access to resources are combined with the perception that the spouse with an SMR is somehow not as good as the spouse with the tenure-track position. It is still further exacerbated for women, because they are more commonly the "trailing spouse" and still subject to the many microinequities of gender discrimination. As one respondent put it, 'It is very frustrating for female Ph.D. spouses to be second class citizens at home campuses and yet enjoy national/international recognition by peers globally. The stress of such a position is serious and ignored!'" Nonetheless, an SMR may very well be the only way for the "trailing spouse" to continue in his/her scientific career.

The ultimate "soft money position" has nothing to do with research. It is adjunct or part-time teaching. Adjunct teachers are typically paid between $500 and $1000 per credit hour, and it is usually possible for a faculty spouse to obtain such a position. The pay is absurdly low (a full-time three course per semester load would typically pay at most $24,000 per year for a Ph.D. scientist!), and the positions are extremely unstable, requiring the spouse to “beg” for courses semester by semester. The stresses discussed in the above paragraph are significantly worse for adjuncts; they aren’t even considered second-class citizens by other faculty, but often non-citizens. Institutions typically offer little or no support for adjuncts to do research.

Anecdotal evidence indicates that adjunct/part-time teaching is the first step on the road out of science for many women scientists. The inability to do research causes them to lose touch with their field; the low status within departments causes them to not be seriously considered when faculty positions do materialize.

Nevertheless, they do offer one of the few ways in which a faculty spouse who wants to only work part-time for a few years (say, due to very young children) can keep his/her brain cells active. The challenge is to keep the spouse from the depression that their low status in the department tends to induce, keep them actively involved with the field and to provide some method of re-entry.

There are several possible ways to improve the status of such positions. Having longer-term contracts (even just a couple of years at a time) would help the morale of adjuncts, by giving them some sense of stability; most institutions can make such a commitment, even if it might mean occasionally creating a new course or two. Institutional recognition (say, through opening up teaching awards to non-tenure-track instructors) would also be a

low-cost way to boost adjunct morale, as would giving adjunct faculty access to institutional resources, such as career counseling. Even if formal research funding is not available, some departmental funding for travel to conferences would help keep the adjunct involved in their field. Finally, re-entry funding, which exists on a small scale through federal funding agencies, can facilitate entry back into the post-doc market.

(d). Alternative Positions (Non-academic)

In the above discussion, we have focused on dual-career couples in academia. This is understandable, given the relative paucity of positions in academia compared with industry. One should note, however, that most of the members of the American Physical Society are not in academia, and a "one-academic, one-industrial" situation (or even a "two-industrial" situation) provides a common solution to the dual-career couple problem.

One problem that many of our survey respondents noted was that many colleges and universities provide virtually no assistance at all in helping spouses of newly-hired or soon-to-be-hired faculty obtain positions outside of the institution. In response to Question 20 ("What would you have liked the potential employer to have done that was not done?"), they commented:

"I would think the personnel office could keep a list of employment resources, etc. in the area to share with new hires."

"Put my partner in contact with a headhunter, and pay for any related fees."

"Have resources to ACTIVELY help find a job for partner."

"Have information on the opportunities in the geographic area; e.g. listings of colleges/industries/labs"

"Use their networking connections to find local job leads for him."

"Aid us in making employment contacts in industry."

"Would have liked the institution which had many good connections to have been willing to give us names and contacts to facilitate the search for employment for my spouse, and to consider helping my spouse visit the area to see if he thought he could find employment."

"I would have liked a list of contacts in the area, interviews set up in-house, a route sheet distributed on the second spouse's behalf."

Fortunately, a growing number of institutions are doing what these respondents suggested. The spousal hiring programs mentioned in Section V (b) (at Wisconsin, Illinois, UC Davis and Purdue) all actively help spouses obtain positions in industry. As an illustration, we will discuss the program at Purdue, but one should keep in mind that the other programs are very similar.

The Spousal Relocation Assistance Program at Purdue has a half-time relocation specialist. The specialist, Tari Alper, has a comprehensive knowledge of local companies, industries and organization, and will identify resources in the Greater Lafayette area, suggest networking possibilities, and alert appropriate companies and organizations of the availability of the talents of the accompanying spouse. She will assist spouses in finding employment by generating network leads, making referrals, facilitating and coordinating contacts, and developing job search strategies.

The relocation specialist serves as a resource to deans, VP's, directors and chairs in their recruitment efforts, works with Personnel Services and other University offices, and periodically updates information on employment opportunities in the community. In short, the Program does everything suggested in the above comments (and the relocation specialist is the "headhunter").

During a job search, when finalists are selected for on-campus interviews, the administrator will send them the Program brochure. As discussed in Section V (b), no specific questions about spouses are asked during the actual interview process. Should the candidate be interested in getting assistance from the Program, they ask the hiring administrator. The hiring administrator then contacts relocation specialist, who can then begin to work with the spouse. Formally, the spouse becomes part of the Program once an offer to hire is made in writing and the hiring administrator has requested spousal assistance. At that point, the specialist will meet with the candidate, and will assist the accompanying spouse by generating network leads, facilitating and coordinating contacts and circulating the resume.

The Program has been very successful. Last year, over 60 spouses of newly-hired faculty used the Program. Most obtained employment, some at Purdue, and some in nearby industries. The total cost of the program is relatively small (requiring only a half-time hire plus some office equipment) and comes out to be much less than the cost of an extra recruiting visit for each new faculty hire. This extremely productive, and "family-friendly" Program can greatly facilitate solutions to the dual-career couple problem.

Of course, many of the functions of these programs can be performed by concerned department chairs and faculty members. Physicists should be much more aware of the possible industrial contracts in the area. It is important for department chairs to make contacts with companies before job searches even begin. Companies which hire scientists welcome close ties with Physics departments, since these departments can be sources of highly-trained future employees, and such contacts can lead to co-operative internship opportunities and funding. Establishing close contacts between industries and college and universities can be very beneficial independent of any dual-career issues. Then, when a dual-career issue arises, the contacts will already be there. Departments can also work closely with programs like the above Relocation Program or Career Counseling offices to develop expertise in scientific/technical job searching. Thus, it is crucial for departments to take a proactive role in establishing close ties with companies in the area, for the sake of undergraduates (through internships) and graduates (through possible positions) as well as dual-career couples.

(e) Commuting

One of the most difficult aspects of the dual career couple problem occurs in which the only way the couple can both continue their careers is to live apart from one another. We did not specifically ask survey respondents whether or not they had been lived apart. However, the large number of respondents who mentioned that they had done so, as well as overwhelming anecdotal evidence, indicates that a sizable percentage of dual-career couples have spent at least some time living separately. Commuting becomes a major factor in the lives of many dual-career couples. (By "commuting", we refer to relatively long-distance commuting which requires maintaining two residences, not day-to-day commuting.)

For couples without children, commuting for a limited period of time, while unpleasant, can be tolerated, although it certainly can put a severe strain on the relationship. When the positions are permanent, some couples simply accept commuting as a long-term aspect of the relationship.

"He was a doing a post-doc in Europe and later worked on the East coast while I finished my degree in California. These long term and long distance separations may be bearable (but unpleasant) when there are no family obligations, but I would not see them as a long term solution."

"We were a "commuter marriage" for 3.5 years (across country). Even during graduate school, we attended universities 400 miles apart. My impression was that most male colleagues did not approve of this living arrangement. It could have terminated our marriage; in the end, not without effort, it made it stronger."

"I'm working in one city while my husband works in another city. While I have heard of this situation working for some people, we are finding it a horrible strain on our relationship."

"When you spend 10 or more hours every week in an airport or on a plane, you can't do your best scientific work, you aren't necessarily present for important networking opportunities, and you aren't relaxed enough to enjoy the time you have with your spouse. On the other hand, if you don't see each other on a very regular basis, the relationship suffers irreparable damage. Finding a balance is extremely difficult, especially if family is important to you."

"We are currently living 1000 miles apart. She has been told that there are at least 5 other science faculty at the institution who are living away from their spouses for the same reason."

With children, however, the situation is much more difficult:

"At this time my husband is staying home with our infant son. I already had a job and he'd been trying to finish his graduate degree at the time our son was born. Our decisions have been deeply affected by us living 2000+ miles apart for a year when I first got my postdoc. We have vowed not to put our family through that again."

"It is common in our field (high energy) lately that families live separately (different states, even different countries). This is because it is not easy to find a job, and even more difficult to find two jobs in the same geographical location. Family life is not usually a priority for high energy physicists, but it is for us. We would never live separately, even if we had no children. Since we have a kid, the option is unacceptable."

Many couples are forced to either give up the idea of children, or drastically scale back a career, rather than live apart.

"Being tenure track at two different universities separated by 900 miles, we have had to postpone having children. Like many academics, neither of us had children during graduate school. So we are now facing the situation of having children at a time in our lives when most people choose to stop having children. The biological disadvantage in our case is obvious."

"He chose to take a post-doc at the university where I am employed so we would not have to be separated. He turned down a faculty position at a university in another city so we could be together. Ultimately, he took a job in industry in the same city. Probably we would have considered living apart if we had not had children."

"We decided to try to get pregnant, but we each have tenure at institutions separated by 270 miles. We've been otherwise doing well with "the Commute" but the decision to have children changed this--we began applying for jobs elsewhere."

"My wife left a very nice teaching position at an outstanding University which was 3 hours away be car to start a family. "

"At the time of my job search (post-doc), my husband had an 8-year career with NASA and we had a 9-month old son. These two factors basically anchored me to our current geographical location and made me uninterested in going on the post-doc circuit. I was not (and still am not) willing to sacrifice the family's well being to the very interesting and challenging job offers I received from out-of-state"

Alas, there do not appear to be any simple solutions to this problem. There have some fairly creative approaches, however. A well-known couple, Joseph Weber and Virginia Trimble, have faculty positions at Maryland and Irvine, respectively. Every fall quarter, she is on leave from UCI and visits Maryland; every spring semester he is on leave from Maryland and visits UCI. Both institutions basically pay each a half-salary (this varies slightly over the years). The arrangement has been informal, but has continued for a quarter of a century. They do sacrifice some benefits (retirement and sabbaticals), and lose a month of summer (UCI is on a quarter system while Maryland is on a semester system), but have successfully managed to deal with the commuting problem. In a sense, this arrangement is similar to two shared/split positions, discussed earlier. If a couple has two permanent positions separated by some distance, they could suggest a similar arrangement, alternating semesters. For a large department (which can adjust to having two faculty members during one semester, and none for the other semester), such an

arrangement can have many of the positive aspects of shared/split positions. It certainly can't hurt to suggest the possibility.

This sort of arrangement can also be done even more informally. Since many institutions allow sabbaticals every seven years, and also often have support for visiting scientists (and don't object to the occasional year on unpaid leave), couples can stagger sabbaticals and leaves, thus ending up spending a rather high percentage of their time together. For example, in a seven-year period, with two sabbaticals, two leaves, plus summers--they would be apart for 20% of the period, with very little loss in salary.

Institutions can also do a great deal to alleviate the stress of commuting relationships. Assigning Tuesday and Thursday classes, for example, would make moderate-distance commutes much more palatable, allowing more frequent weekend visits. For longer commutes, employers can help in other ways:

"The university where my husband is a faculty member is on the opposite coast to my university. My employer has provided an ample travel budget in my start-up package. This allows me to travel to the national laboratory where both my husband and I do research. Therefore, I see my husband several times per month at the lab."

For couples that don't have faculty positions, interesting short-term arrangements can also be suggested:

"At that time, we had an arrangement where I had a postdoc in Boulder and my wife had one in Berkeley. To avoid being separated, we lived in each location simultaneously by spending a month in Boulder, then a month in Berkeley, etc. My postdoc finished first, and potential employers were open to us continuing the arrangement. I should say that it was much easier for us as a theorist and a numerical modeler to telecommute in this way than it would be for an experimenter."

The above suggestions apply primarily to academic positions, but employers in industry can also be helpful. The increasing use of telecommuting has the potential to alleviate many of the difficulties of dual career couples. When one partner is in industry and the other is in academia, increasing cooperative arrangements between the institutions can be beneficial to all concerned, as discussed in the previous section--such arrangements can allow couples to follow some of the above suggestions.

Another possible way to alleviate the situation would be more federal support directed at scientists, rather than institutions, such as moveable postdoctoral fellowships. One respondent noted:

"The situation in France is easier than in the U.S. because most academic jobs in France are concentrated in Paris and there are nationally funded positions that can be taken to any institution in the country."

Obviously, one can't change the location of academic jobs in the U.S., but nationally funded positions (that could be taken to any one of a number of acceptable institutions)

would help. It is unlikely that any such permanent positions could be arranged, but post-doctoral positions could. These could be similar to NSF Graduate Fellowships.

An example of such a program is the POWRE (Professional Opportunities for Women in Research and Education) program. POWRE awards are "designed to provide a one-time input of funds at a critical stage in the Principal Investigator's career, a means by which she can take advantage of an opportunity that will contribute to a significant, identifiable advance in her career path." These awards are associated with the P.I., and not with a particular institution, and thus can be moved. They would seem to be a good short-term solution to the commuting problem. Unfortunately, they are very difficult to get. Last year, only 38 awards were given for the entire mathematical and physical sciences program.

(f). Legal Responses

(i) Nepotism laws

Many of the respondents to the survey mentioned that their attempt to get a position in the same department as their spouse was blocked by so-called "nepotism" rules (more precisely, "anti-nepotism" rules):

"A friend of mine applied to the department where her husband already had a tenure track position. The chair said she was clearly very qualified for the job but that he was afraid that if he hired her, he'd be accused of nepotism. He suggested it would help if she could get an offer from a comparable or better school. "

"(State University) does not support dual career couples. They adhere to the letter and the spirit of an old (state) anti-nepotism law still on the books. This is contrary to the behaviors of other (state) univs. "

"Because of nepotism rules, I changed fields and moved to another Department than Physics (e.g., Planetary Science and Geophysics)."

"One cited anti-nepotism rules as making it impossible to consider both of us."

"I was offered a job they even refused to consider my husband for a second job even though he was well-qualified for it (this was University of XXX and they said it was because they worried about nepotism). "

"My husband and I applied for two positions which were open simultaneously at the same department- the one for which I was applying was somewhat beneath my qualifications, but he was applying for a tenure-track job, and at least the one for which I was applying was still in the field, and was a full-time position. Apparently, the department felt that there was too much opportunity for conflict or possible nepotism issues if they hired both of us, so they offered my husband the tenure-track job and offered to hired me as a P/T adjunct teaching."

"There was a position open at my institution which matched my wife's qualifications

perfectly, but my institution refused to even interview her for the position because they have a strict anti-nepotism policy."

In many states, old anti-nepotism laws are still on the books, and seem to be enforced when it is convenient to cite them. However, our respondents seem to be unaware that such laws are generally in violation of federal law.

It must be emphasized that we are not referring to "chain-of-command" nepotism rules, which would prohibit a situation in which one spouse is higher up in the academic (or industrial) hierarchy over the other, and has some control over that spouse's salary, promotion, evaluation, etc. We are only referring to "parallel" nepotism rules, which prohibit, for example, two spouses in the same department.

The relevant case law can be found in the section on Recruiting and Hiring Practices, Federal Law: Prohibitions, published by the Bureau of National Affairs, Inc. Some anti-nepotism laws are allowed (p. 421:108) "Anti-nepotism policies designed to prevent the aggregation of family members in a company generally do not violate federal law if they are applied evenhandedly and do not have an adverse impact on males or females". It is this last clause that is relevant for physics departments. On p. 421:356, "An anti-nepotism policy which prohibits or limits employment opportunities of a spouse or other relative also could be illegal if it has an adverse impact on job opportunities for women, according to the agency (EEOC). Whether such a rule will be upheld depends on the specific facts of the case as well as on which court hears the complaint." On the next page, a specific case is cited—here, a no-spouse rule in a meatpacking plant where most of the workers were male was found to be in violation of Title VII by the U.S. Court of Appeals for the Eighth Circuit (EEOC v. Rath Packing Co., 8th Cir., 1986, 40 FEP Cases 580). Thus, it appears that in a profession dominated by one gender, anti-nepotism laws are not only *de facto* sex discrimination but also *de jure* discrimination, and are in violation of Title VII. Physics is clearly a profession dominated by one gender.

There are no specific challenges, to our knowledge, of anti-nepotism laws when applied to science departments, although one would expect the above case law to apply. Readers who have been denied consideration at a spouse's institution because of "parallel" nepotism rules are urged to seek legal counsel.

(ii) Inappropriate Questions

As seen in the last chapter, it is very common for inappropriate and illegal questions to be asked during job interviews, especially of women applicants. A very informal (and completely non-scientific) survey of colleagues indicates that illegal questions (primarily about spouses, and occasionally about children) are asked in a **majority** of interviews of women candidates for faculty positions.

One should not immediately assume that those asking such questions have some nefarious intent. In "small talk" at dinner, for example, it is natural for people to ask about each other's families, and many simply don't think about the fact that discussions at dinner are part of the interview process. In other cases, the questioner might understand that many candidates have a dual-career couple problem, and might

legitimately want to help the candidate. However, as we have seen, such questions often are asked to find out if there will be a "problem" with the hire. It must be emphasized that all such questions, at any stage in the interview process and regardless of the intent of the questioner, are illegal and inappropriate.

Note that we are concerned here with questions asked of a candidate who does not wish his or her spouse's situation to be a factor. Many candidates do wish to discuss the issue at the interview stage. There is a fine line here. Bringing up a dual-career issue during the interview process can hurt the candidate in getting the position in the first place, but can help with a spousal position once an offer is made. Certainly, if a position for a spouse will be a necessary condition of accepting an offer, then the candidate should bring it up at an early stage—this is only fair to the potential employer. But if the candidate does not wish to discuss the issue, and does not initiate the discussion, all such questions are inappropriate.

So, what should the response be to such questions? A candidate can "get legal", refuse to answer the question, and remind the questioner that such a question is in violation of federal law. Such a response is likely to backfire, however. If the questioner has just asked the question casually (as "small talk"), this response will seem very unfriendly and could adversely affect the candidate's chances. On the other hand, if the question is asked during a more formal part of the interview process, such as an interview with the search committee, then a legal response might be more appropriate.

One can try to "deflect" the question or provide minimal information. For example, if a woman candidate, at dinner, is asked "What does your husband do?", one can respond with a brief answer, then say that his situation is not relevant for the position, and change the subject (if the questioner persists, then a "legal" response would be more appropriate). She could also respond with a question, "Why do you want to know that?".

Many candidates, however, choose to simply answer the question, and hope that the answer won't adversely affect their chances of getting the position. Informal and non-scientific surveys indicate that this is by far the most common response.

Once the interview process is over, a candidate who has been asked an inappropriate question does have various options. Much depends on the outcome. If the candidate gets the offer, then there is seldom a problem (although a brief word to the head of the search committee or chair about the question might be helpful for future cases). However, if the candidate does not get the offer, then there are a variety of options ranging from a few words to the search committee chair to a formal complaint with the EEOC. We spoke with some affirmative action officers, chairs and deans about what the best response would be. Most said that the first response should be to contact the affirmative action (or "human resources") officer at the institution, and to tell them (confidentially) precisely what was asked and by whom. They will then make a suggestion based on the nature of the question, as well as previous experience with the particular department and/or individual, as to what the most effective action would be. Affirmative action officers tend to be very understanding about these issues, and are most knowledgeable about what actions would be most effective at that particular institution. Suggestions of affirmative action officers in past cases include a range of options, from informing the search

committee chair about the question, and asking that the offender simply be told that the question was inappropriate, to informing the Dean so that appropriate formal action may be taken. Affirmative action officers emphasize that it is very important to be explicit about the specific question(s) asked, and the name of the questioner, and many suggested sending a copy directly to the Dean. Once the position has been filled, such action will not hurt the candidate, and might help prevent such inappropriate action from occurring in the future.

VI. RECOMMENDATIONS

As we have argued in Section II, it is in the interests of both the hiring institution and the physics profession as a whole that institutions take an active role in addressing the dual-career situation of the physicists whom they wish to hire. Such efforts can help an institution to hire and retain the candidates they choose, and will also help to ameliorate the significant barriers experienced by talented women entering the profession. Since women represent a much larger fraction of younger physicists than of the more senior population (14% of physicists 31 and under vs. 3% of those over 40), the number of new hires who will face such a difficulty can be expected to increase dramatically in coming years. It therefore behooves all institutions to take appropriate measures to address the situation. Below we recommend various of actions which institutions and individuals should consider.

(a) Recognize the existence of the dual-career situation and choose to deal with it

This is the obvious first step, but as responses to our survey reveal, many institutions have yet to take it. As the statistics cited above indicate, institutions of all types at all levels will be increasingly faced with potential hires whose partners are in need of help in finding suitable employment in the area. It is crucial that institutions choose to make an appropriate response. That response may involve anything from establishing a formal, institution-wide office with specific responsibility for such assistance (as in the Spousal Hiring Programs described above), to informal efforts on the part of faculty members to learn of potential physics positions in local industry. But the problem will not go away if institutions ignore it.

(b) Take action before beginning a search

Institutions need to take action in a timely fashion. Once an offer has been made to a candidate, there is generally too little time left to begin an investigation of local employment opportunities or possible model policies for split/shared positions. Institutions, upon recognizing that the problem is likely to affect their next hire (not to mention subsequent ones), need to determine what kind of assistance they will be willing to provide, and obtain the necessary information. Responsibility for this effort should be specifically assigned, whether to an institution-wide office or a faculty member. If assistance with dual-career problems is everybody's responsibility, it tends to be nobody's.

(c) Establish policies regarding split/shared positions, nepotism, etc.

As our survey responses have shown, many institutions have been asked by a candidate to consider a split/shared position but were unable to do so in the time frame of a specific hire. Therefore it is important that institutions explore the various models for such positions beforehand and discuss them in the context of their own needs, present and future. By working out some of the details of such policies in advance, an institution can be prepared to act quickly when such an arrangement becomes desirable in a particular hiring situation. The same is true of nepotism policies—department chairs and other responsible parties have a duty to investigate the actual policies in force in their institutions (not just what they believe them to be), and to discuss the status of these policies with the institution's legal counsel. Given that these policies appear to have a negative impact on the recruitment and retention of women in physics, physics departments should consider measures to remove or modify such policies. But such actions must be taken in advance of a specific hiring situation.

(d) Seek information

In conjunction with this report, we are establishing a site on the World Wide Web to provide institutions with access to information about actions they can take in response to the dual-career situation. The Website is <http://www.physics.wm.edu/dualcareer.html> On this site we have posted specific policies for split/shared positions, spousal hiring, and the like which have been adopted by various institutions. The site also contains the names of contact points at these institutions for those wishing to learn more about the implementation of specific policies and the effects they have had. We invite individuals and institutions that have found creative approaches to the dual-career situation to contact us with information they are willing to share, which we will then post on the site. Links to and from other relevant sites (such as the home page of the APS Committee on the Status of Women in Physics) will be provided.

(e) Federal policies

It is clear that the dual-career-couple problem is one of the major factors in slowing the growth of the percentage of women in physics. Yet, to our knowledge, there are no federal policies or programs aimed at helping dual-career-couples. Some programs, such as the POWRE program discussed in Section V(e), can give valuable short-term help, but such programs are woefully underfunded. One can imagine programs similar to this program specifically aimed at dual-career-couples (yes, such programs discriminate against single scientists, but we have seen that the entire system discriminates against married scientists). In any event, programs which offer flexibility in location (such as the POWRE program) or which can supplement a partial college/university salary could certainly alleviate some of the difficulties faced by dual-career-couples.

In addition, funding agencies can be more sensitive to the needs of dual-career-couples. For example, the agencies are reluctant to provide support for an individual who has a particular soft-money-research position for the long term (more than 5 years). The reasons are that the salary eventually becomes too high, and that the individual gets trapped into the position and has difficulty finding employment elsewhere. However, in a dual-career-couple situation, such a position might be the only way a spouse can stay in

science, and thus a more pro-active response of the funding agencies in such cases (perhaps, for example, with gradually increasing institutional support) would be helpful. In general, it would help if funding agencies would be as flexible as possible in dealing with dual-career-couples.

Finally, the ruling that anti-nepotism laws in male-dominated professions are illegal was a ruling of only the 8th circuit and thus only applies in that circuit. A more widely-applied ruling would be welcome.

(f) Develop contact networks for hiring

Because the number of physics-related positions in a given area is usually low, it is important for institutions to be able to provide contacts for job-seekers in their area. As discussed above, such contacts may benefit a department in other ways (such as job opportunities for their graduates). Simply being aware that "Company A might be willing to hire a physicist," or "Department B might need a part-time instructor" is not enough—job-seekers need to be provided with names and phone numbers of specific individuals with whom they can explore what opportunities might actually be available. Although that individual may not be aware of a position that suits the job-seeker's qualifications, s/he should be able to direct the job-seeker to other points of contact. While it is the individual's responsibility to "land the job," the institution can at least tell her or him where to place the hook.

VII. CONCLUSIONS

In this report we have summarized the responses to a survey of the experiences of dual-science-career couples, and many of the institutional responses that they have received. Many of these responses either made the situation worse or did nothing to improve it. We have argued that it is in the interests of institutions to instead take an active, positive role when faced with potential hires who seek employment for their spouses. Such actions will benefit not only the job candidate and the institution, but also the physics profession as a whole. For institutions that choose to aid themselves and the physics community in this way, we have offered recommendations for action and sources of information, as well as examples of successful programs and policies. We hope that institutions will decide to meet this challenge, and thereby achieve their hiring goals and also enhance the representation of qualified women in physics. The "two-body problem" will inevitably worsen in the future, and forward-looking institutions will choose to take appropriate action. As physicists who have experienced the dual-career situation ourselves, we hope that an increasing number of institutions will choose this path.

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APPENDIX A

DUAL CAREER ISSUES QUESTIONNAIRE

As the number of couples in which both members are trained in science increases, more and more people are facing issues in finding two science-based jobs in the same geographic location. In an effort to document the scope of the situation for physicists, and find examples of solutions to the problems which arise, we would like you to answer the following questions. Please give only one set of answers per couple. If you prefer not to answer over the web, you may print the survey and send it to the address given at the end. If you are part of a dual-professional couple in which the other member is not a scientist, please fill out the survey -- many of the same concerns will apply. In each question, "partner" refers to your current spouse or partner, or your most recent spouse or partner if you are not now married and do not have a partner. All answers will be held in confidence.

1.Is your partner also trained in science?

Yes
No (please go to question #4)

2.Are both of you trained in physics?

Yes (please go to question #4)
No

3.What is your partner's scientific field?

Astronomy
Chemistry
Other Physical Science
Engineering
Biological/Biomedical Science
Other (Please Specify)

4.What is your age?

5.What is your partner's age?

6.Are you female or male?

Female
Male

7.Is your partner female or male?

Female
Male

8.If you and/or your partner have or plan to have children, has this affected your job choices or those of your partner?

We have no children and do not plan to have any.
Children have not affected my job choices or those of my partner (please go to question #10)
Children have affected MY job choices, but not my partner's job choices
Children have affected my PARTNER'S job choices, but not my job choices
Children have affected both our job choices

9.In what way did children affect your job choices or those of your partner?

10.What type of job did you seek in your most recent job search? (indicate all that apply)

Postdoc
Faculty job at research university
Faculty job at undergraduate institution
Permanent industrial job
Permanent government laboratory job
Other (please specify)

11.What type of job did you ultimately take?

Postdoc
Faculty job at research university
Faculty job at undergraduate institution
Permanent industrial job
Permanent government laboratory job
Other (please specify)

12.What type of job did your partner seek in his/her most recent job search? (indicate all that apply)

Postdoc
Faculty job at research university
Faculty job at undergraduate institution
Permanent industrial job
Permanent government laboratory job
Other (please specify)

13.What type of job did your partner ultimately take?

Postdoc
Faculty job at research university
Faculty job at undergraduate institution
Permanent industrial job
Permanent government laboratory job
Other (please specify)

14. Have you or your partner changed your long-term career goals because of issues involved in dual-science-career couples?

Yes, I changed my long-term career goals
Yes, my partner changed her/his long-term career goals
Yes, both of us changed our long-term career goals
No (please go to question #17)

15. Have you or your partner changed your short-term career goals because of issues involved in dual-science-career couples?

Yes, I changed my short-term career goals
Yes, my partner changed her/his short-term career goals
Yes, both of us changed our short-term career goals
No (please go to question #17)

16.In your most recent job search, did you or your partner take a lower-level science job, a non-scientific job (or no job) as a result of issues involved in dual-science-career couples?

Yes, I did
Yes, my partner did
Yes, both of us did
No

17.At what point in your most recent job search(s) did you first discuss with potential employers the fact that you were part of a dual-science-career couple?

Before I interviewed for the job

At the time that I interviewed for the job
After an offer of a job was made
Never (please go to question #21)

18.What response(s) did your potential employer(s) make to your situation? Please Include all recent job searches.

19.What aspects of this response did you find to be particularly positive?

20.What would you have liked the potential employer to have done that was not done?

21.At what point in your partner's most recent job search(s) did she/he first discuss with potential employers the fact that she/he was part of a dual-science-career couple?

Before my partner interviewed for the job
At the time that my partner interviewed for the job
After an offer of a job was made
Never (please go to question #23)

22.What response(s) did your partner's potential employer(s) make to your situation? Please include all recent job searches.

23.Do you know of specific positive or negative response(s) made to other couples in situations of this type? Select all that apply.

Yes, positive response(s) at my institution
Yes, positive response(s) at another institution
Yes, negative response(s) at my institution
Yes, negative response(s) at another institution
No (please go to question #26)

24.If you selected one or both of the first two responses in question #23 (positive), please give details (no individual names or identifying details will be given in the report).

25.If you selected one of the second two responses in question #25 (negative), please give details (no individual names or identifying details will be given in the report).

26. What other comments on the dual-science-career situation would you like to make?

Thank you very much for completing this questionnaire. We hope to disseminate the results in a forum accessible to physicists, such as the APS Web page or Physics Today.

Paper responses may be sent to:

Laurie McNeil
Dept. of Physics and Astronomy
University of North Carolina
Chapel Hill, NC 27599-3255

APPENDIX B

Knox College Policy on Shared Faculty Appointments (effective Feb. 4, 1994; subject to revision)

1. Definition: A shared faculty appointment is one in which two faculty members share equally one full-time position.

Each person sharing the appointment will assume half of the duties of a full-time position which includes: teaching, academic advising, college service, and the pursuit of scholarly (or appropriate creative) activities. Variations, however, in the distribution of responsibilities are subject to the discretion of the dean of the college in consultation with the departmental chair.

2. Conflict of interest: Each person sharing an appointment will be entitled to a full vote in faculty meetings, and either or both may assume administrative functions, but neither may vote on personnel matters that would affect the other's rank or status, and neither may assume responsibility for making decisions regarding conditions of the other's employment. Both people sharing an appointment will not ordinarily serve on the same committee.

3. Renewal and Tenure: Renewal and tenure decisions under a shared appointment will normally follow the same timetable as a regular appointment, and each appointee will be expected to have the same credentials and scholarly attainments that meet the college's stated standards for promotion and tenure (see Knox College Faculty Handbook, section III.B). In the case of each appointee, a record of institutional service is expected commensurate with part time status.

Under the normal condition, in which both parties to a shared appointment enter the contract without tenure, both will be considered for renewal and tenure at the same time, and renewal or tenure will be granted to both or neither.

In those cases where the College has initially appointed one person to a full-time position, and then it is agreed to convert that appointment to a shared position, part of that agreement will include developing (with the dean and president) an equitable timetable for the joint tenure review.

4. If either person sharing an appointment should cease to share in the job, for whatever reason prior to a tenure decision, the position becomes vacant. If those sharing the appointment are tenured, and one person ceases to fulfill their part of the contract, the other will normally assume the full appointment.

5. Salaries and Benefits: Beginning at the time that a shared contract is undertaken, each individual will be paid a proportion of the salary prorated according to teaching duties. Each individual will be entitled to participation in the full range of fringe benefits.

The total health care benefit will not exceed the amount of the College's contribution to a family plan. Other benefits will not exceed in cost the benefits held by one person holding a full-time position.

6. Leave Policy: Unless specified otherwise, the leave policy will be administered in terms of shared leaves, i.e. for a one-term leave, each person would be entitled to one quarter leave at the usual pay each was receiving, but with the understanding that, with the usual teaching load for each person of one course per term, then each would receive compensation prorated by the usual rules, but according to the usual load. For instance, one term of leave at full pay would become one course reduction with no reduction in pay for each half of the faculty pair. With regard to parental leave, each person would receive one term of leave, i.e. a reduction in load of one course each.

APPENDIX C

Shared Position Policy at Grinnell College

Two persons who are both members of the Grinnell College faculty are able to share a single faculty position. By creating shared positions, the College has responded to those consistent employment challenges incurred by academic couples in small communities such as Grinnell. Both individuals sharing a position have full faculty status. The College benefits by attracting faculty to the College who might not otherwise be able to accept a position at Grinnell College. By having two persons in a single faculty position, the College also may gain curricular flexibility.

Because of the contractual differences between shared positions and single full-time positions, shared-position issues must be carefully considered both for current holders of shared positions and for candidates applying for faculty positions at Grinnell on a shared basis. This document presents a discussion of these issues.

1. Persons considering a shared-position application for an advertised faculty position must decide prior to the on-campus interview of the applicant pool if they wish to apply separately for the full-time position or together for a shared position. The College will

honor their choice. For shared-position candidates, both candidates must be ranked near the top of the applicant pool to be offered a shared position.

The College will also consider converting a single full-time appointment to a shared-position appointment. The department should present a proposal to the Dean that indicates how the conversion would benefit the College and that presents evidence for excellence in teaching, scholarship, and potential service on the part of the candidate. The Dean will take the proposal to the Executive Council for its recommendation. The Executive Council will decide whether the proposal is sufficiently compelling and recommend whether the College should proceed with its normal hiring procedures.

2. The College will not require one member of a shared position to teach full time during an approved family or medical leave granted to the other partner. However, in the event that one of the individuals holding a shared position resigns or is unable to continue his or her teaching duties for a period of time extending beyond an approved medical or other leave of absence, the other individual in the shared relationship must assume teaching duties up to the equivalent of one full-time position. For example, if one individual in the shared-position relationship suffers a long-term disability or resigns, the other individual in the shared-position relationship must assume the full-time position. To fulfill this obligation, shared-position faculty must have expertise in the same or closely allied academic discipline or subdiscipline and must hold appointments in the same academic department.

3. As regular, continuing members of the Grinnell College faculty, shared-position faculty have the same duties, obligations, responsibilities, and privileges as outlined in The Faculty Handbook for all regular faculty. Thus, shared-position faculty have the same performance expectations for teaching and scholarship as full-time faculty and have the same contract and promotion review schedules and procedures as full-time faculty. Service expectations for the shared position should be the same as for a single regular faculty position. Each faculty member in a shared-position relationship is separately considered for contract renewal and for promotion and tenure. They may each apply for support for attendance at an annual professional meeting and for grant board support according to the guidelines in The Faculty Handbook.

4. Since the current full-time teaching schedule at Grinnell College is five courses or course equivalents per year, a full-time shared-position schedule is five courses per year. Each faculty member in a shared position shall teach at least two courses per year unless given permission to teach fewer courses by the Dean of the College.

5. Currently each shared position carries a base salary associated with the position rather than two base salaries respectively associated with each individual in the shared-position relationship. For appointments made after September 1, 1994, each individual will have a base salary. Having individual base salaries allows the College to make appropriate merit salary increments and to develop shared-position appointments with individuals who have different experience or academic rank. The College will make salary payments to each individual according to one of two methods.

Method one: Salary payments will be made to each of the faculty members at their

respective prorated salary. That is, if the faculty members teach respectively three and two courses in a given year, each will receive three-fifths and two-fifths of their respective individual base salary. Each additional course is compensated at one fifth of the respective individual base salary.

Method two: Salary payments will be made to each of the faculty members at the prorated average base salary of the shared position faculty members. That is, if the faculty members teach respectively three and two courses in a given year, each will receive three-fifths and two-fifths of the average base salary calculated from the two individual base salaries. Each additional course is compensated at one fifth of the average base salary.

With either method, if one faculty member assumes the full-time position, the base salary of this faculty member will be his or her individual base salary.

Shared position faculty must chose method one or method two at the time of appointment. Subsequently, at the conclusion of every fifth year of service at the College, they may elect either method of salary allocation for the next five years.

Regardless of the method of salary allocation for the shared position, if the shared position members have approximately equal teaching duties, current College policy permits the College upon the request of both members of the shared position to allocate 1/2 of the sum of their actual salaries to each member of the shared position. In this case, each member would receive the same salary for the year.

6. Shared-position faculty members qualify for those benefits described in The Faculty Handbook. Since shared-position faculty members share full faculty positions, benefit waiting periods for all shared-position faculty members will be those for full positions rather than for part-time positions.

7. Each faculty member in a shared position is eligible for a sabbatical leave in accordance with The Faculty Handbook. The College will base the compensation during this sabbatical period on the average number of courses taught per year calculated from the previous six years of teaching, excluding unpaid leave periods.