MILDRED DRESSELHAUS

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Interview with Mildred Dresselhaus by Shirlee Sherkow

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Sherkow: This is the Seventh Session with Mildred Dresselhaus in her MIT office. Last time, we left off beginning to discuss your involvement in women's issues and women's groups and women's activities here at MIT. We rather botched up the chronological discussion of this. We had discussed the seminar group that you had set up in 1967-68 for students at MIT to discuss career problems and any other related problems they wanted to talk about. Then you mentioned, once the session was over, that we really should start with Emily Wick. This seminar group that you did set up was a forerunner for the Forum, which you co-founded with Emily Wick. So why don't we start after this seminar that you set up in '67-68.

Dresselhaus: At the end of that academic year, the seminar had its natural end. The following year, instead of doing the same thing--I'm not one that likes to do the same thing too long--Emily got me into this admissions business. She got me into helping her read applicants, women applicants to the Institute. In those years, women applicants were reviewed

in a different category from the men applicants. In the Women's Admission Program we had a team. Emily was one of the people, and Bryce Leggett was another person. Then there was somebody from the Admissions Office, Juanita Steller, who was the statistician. She was a former MIT student and at that time was on the Admissions staff. She was later replaced by Cynthia Bloomquist.

Sherkow: This was the one group that you did discuss.

Sherkow: Yes. That program brought me into a great deal of contact with Emily Wick and her operation. Now around 1970 or '71, there was a change in Administration--or probably the change in Administration in the Dean's Office happened prior to that because it was in that period that Emily had trouble in running her office. She had run her office in and under Ken Wadleigh, who was the head of the Dean's Office when Emily took that job; then there was a change of Administration to Dan Nyhart. He became the new Dean of Students. He had different ideas about how to run that office, and conflicts arose between him and Emily. She decided, at one point, that she had enough of that job and she would resign. Now, she expected that what would happen was that somebody else would be appointed to that position. But, instead, the decision was made to abolish the office itself.

Sherkow: What was the exact office?

Dresselhaus: The office was the Dean of Women Students. Emily had had that job almost from the beginning. There was Dean Mattfield who preceded Emily in that job, but she was there for only a short time. Emily was in that job for almost the entire existence of that position. Then the position

was abolished quite suddenly with Emily's resignation.

The students were very, very upset because her office was a collection point for them, a rallying point they had. There were many students who felt kind of dependent on that office for coming in and chatting, for social adjustment, and for reinforcement. At that time there were very few women faculty, and women students felt that they needed support services. As a matter of fact, there were few women at MIT in any category other than secretarial and low administrative positions.

I remember that Dean Nyhart didn't have the sensitivity for the girls. He didn't seem to really understand their needs. What really threw the women students and started a kind of semi-riot was his statement that if the girls felt that they needed somebody to talk to about their problems, there were plenty of secretaries around here. His idea was that all women were equivalent and could understand each other and support the women students. The women students didn't really always see it that way, so there was a major conflict that developed, and it developed very suddenly.

Before the conflict started, between the women students and the dean's office, Emily made plans for a smooth transition; Emily told me several months before she even made the announcement to Dean Nyhart that she was planning to resign. So I knew of that plan prior to its becoming public knowledge. We were trying to think of some contingency plans of what might be done if there would be no dean's office. In that way, we generated a talk session which was similar to this talk session that we had in '67-68 but a little bit more sophisticated utilizing all the additional experience we had in that ensuing period.

What happened, however, that completely jumped the gun was the students'

reaction. We were planning something that was low-keyed and small and intimate and only involving a small number of students. The timing of this happening coincided with one of MIT's earliest IAP's, if not the first one. I guess it wasn't the first one, but it was one of the very early ones. The problem in the dean's office arose just around the month of January. So it seemed obvious to us that we should make an announcement of our talk session in the IAP Bulletin. In writing the bulletin announcement, it was obvious to us that we had students in mind, but the word 'student' never showed up in the ad. The first meeting of the class, which we expected would be a class get-together, was scheduled for a small room--the center of the Cheney Room. We expected about fifteen people to show up, and perhaps a hundred fifty or two hundred came. The place was just crawling with people, and there was everybody that came. The ad didn't say 'students,' so just about everybody came. It turned out there were many women who felt that they wanted to get together and talk about the issues that were in this very small blurb announced in the IAP Bulletin. Also in the room were Emily and I. We showed up there, too. I had a class just before this. I arrived kind of late. Emily told me that I was supposed to do the first session, so they were waiting for me to start. I came into the room about two minutes or three minutes after the thing was supposed to start, and here was this mob of people. I still remember that tremendous mob. It was clear that the original agenda and direction of our little talk session would have to be greatly revised with this difference in personnel. So here I was, right on the spot--this was a question of quick thinking. Of course, professors around here are pretty good at thinking fast on

their feet because when you go to a professional society and give a talk, you have all your opposition out there in the audience taking pot-shots at you. So you get pretty capable of thinking fast and coming up with something sensible. This comes through years of experience in not getting flustered by the attack. So immediately, right on the spot, I changed the agenda of that meeting and we started asking people to say what it was that they wanted to discuss; then we changed our first session to an organizational meeting, and we solicited suggestions for lots of different discussion topics.

The range of topics was exceedingly diverse. The people were of very diverse interests and goals and aims. This was at a critical time--sort of the beginning of Women's Lib, and there were some very conservative women who came, and some very radical ones, too.

Sherkow: What was the year?

Dresselhaus: 1971.

Sherkow: The report indicates it was late January, 1972. [Referring to Ad Hoc Committee Report on the Role of Women Students at MIT].

Dresselhaus: Yes. So that's right. We were working on this in '71, but it came to fruition in '72. It took a lot of diplomacy to keep these people from slugging at each other at that meeting; the feelings were going thick and fast. There were many women who got up and had a lot of very important issues to discuss. These were issues very close to their hearts. Some had very aggressive things to say about the position of women at the Institute, and what should be done. On the basis of this discussion, we organized a number of topics, and we continued

throughout IAP meeting on a twice-a-week basis, going over the issues that were brought out at this first session. That meeting in the Cheney Room with a hundred fifty or two hundred people was the origin of the Women's Forum.

That was the first meeting of the Women's Forum, and has become the Women's Forum. At that time, it was clear that they were a lot of diverse women's groups, and we could identify them. We therefore made subgroups of the Women's Forum. One subgroup was a student subgroup; it didn't exactly coincide with this but pretty much had to do with this. This student group was the one that wrote this Ad Hoc Committee Report. That report was somewhat directed to the original intent of the Women's Forum. The Ad Hoc group was a way to get the students to find out what their needs really were and how they might be addressed. That was the objective of this Ad Hoc group. However, the group was officially solicited by the dean of students. More explicitly, what happened was that ten women faculty were invited to talk to Dean Nyhart. These women faculty members were almost all very upset about this development in the dean's office. The students felt left out. The women faculty wanted to hear from the students what they felt they needed and then after having studied these needs, make some recommendations for action.

We made no assumptions that there would be a new dean. In fact, that was only a very small part of what these recommendations were about. The recommendations of the final report were rather far-reaching. A number of these recommendations have been implemented. There has been no study, no in-depth study like this since that time, although there's

been noises of doing another study. A number of people have gotten in and done some more things. But there hasn't been another in-depth study since that one.

Sherkow: What were some of the recommendations?

Dresselhaus: When you go through the Ad Hoc Committee Report, you'll see that it addresses a large number of topics. There were two major recommendations from among many other recommendations. One was that a woman was needed in a very high position at MIT to bring to the attention of the top level administration what it was that women needed; that is, to identify the different needs of women and men at the Institute. Maybe forty percent or thirty percent, but a very sizable part of the Institute was female. At that time there wasn't anybody in the Administration who was sensitive to the needs of women. As an example of what I mean was the statement that when things bother you, you can go find yourself some secretary that will listen to your troubles. That statement didn't go over with the students one single bit. That was this faux pas that had deep implications because it really offended a lot of women.

I was mentioning the different subgroups that came out of the Forum. There's one that had to do with the biweekly staff; that's still functioning, and it's a very active subgroup. There was another group that was a faculty group that met very diligently for some months after the start of the Forum, but then at the end of the academic year, it dispersed and died. But it was resurrected some time later in the form of the Women's Faculty Luncheons, which will come up later on in

the discussion. The subgroups that are still in operation are the subgroups having to do with the employees, and the employees run them themselves. They serve a certain function that's important--very important to those subgroups. These subgroups have been influential in collecting the thoughts of appropriate employees and making a case to the Administration on selected issues.

Sherkow: You're indicating the biweekly group?

Dresselhaus: Yes. But I think there's also another group of exempt--of librarians and administrative assistants. There's another group. I think there are two groups that still meet. I think these details should be checked. Dotty Bowe would know exactly the status of the various subgroups and how active each of them still is.

Among the recommendations of the Ad Hoc Committee was to have a woman at a very high level. That recommendation didn't really come out in the report in its final form. This recommendation was made in detail by the Forum during its first six weeks or so of its existence. This specific report differs from the [Ad Hoc Committee] Report, itself. The Ad Hoc Committee Report came primarily from the student sector; there was also a Forum Report on what changes should be made at the Institute. The Forum Report was taken very seriously by the Administration. I think that more has happened at MIT even than was asked for in that document. The woman at the high level in the MIT Administration turned out to be Carola Eisenberg, herself, as dean of students. That appointment happened very naturally. There was a need to appoint a new dean, and people looked around for who would be the person to take over the job. I think Carola

was chosen because of her qualifications, not because she's a woman. But having chosen her, did put a woman, or a person sensitive to the needs of women in a top administrative position at the Institute with direct voice to the president, which is one of the recommendations of the Forum.

Sherkow: Was this the Dean of Women Students, then? What was the title?

Dresselhaus: The dean of all students turned out to be her title. But that wasn't what was asked for specifically--what was asked for was a woman in a high-level position. There are, maybe, fifteen positions at the Institute that enable one to serve on the Academic Council, which is the body that's just underneath the president. The idea was to get a woman appointed to some position which would give her a legitimate right to sit on this Council. This defines the level of person we had in mind, without specifying what particular job this person would have. But it turned out that we got a woman dean of students and with that job, sitting on the Academic Council was part of the responsibility of that position. But it could have been one of many other things. It could have been any one of the vice-presidents in charge of some major part of the operation of the Institute. We didn't specify what the job would be, that is, what the specific job would be. That was a strength to our recommendation. And it didn't matter, because serving on the Academic Council was the essential feature. The person, of course, has to do well in the job that's undertaken. Having somebody at the Academic Council would allow for many decisions to benefit from input from a woman's point of view. There are a lot of women around here. So that was one issue.

Another one was the need for an ombudsman. When women have problems in their jobs or in the academic part of the Institute, the ombudsman would be somebody that they could go to and get advice on how to behave. Because most of the people that women report to are men, it often puts women in an awkward position. I think this ombudsman was also supposed to serve for men, but was primarily supposed to be for women. The ombudsman became the office of Mary Rowe. She does a lot of things for women at MIT, including ombudsman. Her office was in the original suggestion of the Forum; the Forum recommendation was the creation of the office that turned out to be Mary Rowe's. She's had that job ever since the office was created.

Sherkow: As I understood it, it would be called the Forum Report. I haven't seen it, but I've heard about it.

Dresselhaus: The actual report is very short.

Sherkow: Right.

Dresselhaus: The [Ad Hoc Committee Report] is the long report, but the Forum Report was very short.

Sherkow: The Ad Hoc Committee Report called for more than one person, a larger operation than is going on now.

Dresselhaus: No, not really. They called for somebody in the Academic Council. They called for somebody that would be the ombudsman, and they called for increased number of women faculty members. And I think that there was some emphasis on the idea that when men and women held equivalent

positions, their status would be equal. At that time, there were many women at the Institute who were doing administrative assistant jobs, and if they were women they were called "biweeklies." Employment inequities happen in many institutions. They have a woman and a man who do the same work, but the man has a different title and a higher salary than the woman. This happens at a lot of places. We had a lot of such inequities going on at MIT. One of the things that the Forum asked was a review of the positions at the Institute to see whether the women and men were given equal recognition for equal work; the recommendation was not only to scrutinize this situation, but to make the necessary adjustments where inequities occurred.

A number of things happened as a result of this. The Institute, I thought, responded very well. There was also a question of the Credit Union, where women had to have permission from their husbands to take out a loan, but men didn't have to have a corresponding permission from their wives.

Sheila Widnall comes into the act at this point. I was bogged down a lot with the student subgroup. Sheila Widnall was a senior woman faculty member at that time, who took responsibility for parts of our efforts that I couldn't handle. She took over a lot of the responsibility of the Forum operation. Emily Wick did, too. It's hard to say who did what, exactly. We kind of worked on things together. But the preparation of the report of the Forum was due to Sheila's genius, really. I was very busy working on the [Ad Hoc Committee Report]. I couldn't take on another major assignment.

The thing that was so complicated about the Forum was that the student groups had one vision of what the women at the Institute needed; the secretarial biweekly types had another image; and the research associates had another image. Everybody had their own way of thinking about what women at the Institute needed. It was very hard to form a consensus, focusing on the one or two appointments we were recommending and what the duties of these people would be, so as to satisfy the needs of the various groups. People at our meetings were very aggressive at that period of time. Women felt very insecure at the Institute. Things have settled down very much now. But 1972 was a bad time, anyway. That was right at the time of Vietnam and student unrest. People had a lot of aggressive feelings. This Forum group started out being a nice, friendly group where we were all working together. But when it came down to the details, no agreement could be achieved.

It was Sheila's genius that pulled the whole thing together. In this situation, we could perhaps have interchanged roles, I think; I could have done her job, and she could have done mine. My assignment with the Ad Hoc Committee also had a lot of the same thing; it required a lot of organization to pull off the preparation of the Ad Hoc Committee Report, because it was largely student-focused and students are very busy people. The amount of research and whatever that went into the Ad Hoc Report was large. Sheila and I produced these documents and made the cases to the Administration and our positions were accepted. Everything was accepted; the Ad Hoc Committee Report was accepted, the Forum Report was accepted. Then things started happening. That was the year, 1972.

Sherkow: This Ad Hoc Committee on the Role of Women Students received an award in 1972.

Dresselhaus: Yes. It received the Compton Service Award. I think that was well-deserved.

Sherkow: What did that award really signify?

Dresselhaus: It was the Institute's way of saying that this group of volunteers had done a service to the Institute. It was the [Karl T.] Compton Award that we received. This is a service award for volunteer work for the benefit of people at the Institute. We were very strong contestants for that award, because the amount of time and effort that went into the report was great and it had substantial impact.

Not all of the things were followed up. We wrote this report, and then we went back in the background doing our own things. To produce something of the magnitude of this report, we had to mortgage time against other things. So these other things had to then be picked up. Each of us in the Ad Hoc Committee had other jobs that had to be done. We don't get paid for writing reports like this.

Some of the things were followed up and implemented immediately. The report did arouse the sensitivity of many people around the Institute to many issues. Over a period of time, additional things have been implemented, like this last year the athletic situation has had great impetus. I think that some changes resulted from this report initially, but a lot more has happened when we did the further study.

I was only peripherally involved with that second study on athletics. That was really Sheila Widnall's work. But the time was ripe to do that. We worked on many projects together over the years, and when something is more appropriate to her [she does it].

It could be that the initial impetus for the recent study on athletics came from our carpool. Dotty Bowe and I are "carpoolers." We talk about needs of women students in our carpool; that's the major topic of discussion. She had been talking to me about the problems that the athletic board was having with regard to women's athletics. She's a member of the Athletic Board. We decided that we needed to make a study of women's athletics, and the time for that second study just seemed to be the time that we did it. There's always an optimum time for various things. A committee was appointed, a study was made, recommendations were presented, and they were implemented. I think that once we show what the problems are and give guidance for their solution, we get a lot of support from the Institute. Things just happen at MIT in a very positive and constructive way.

Sherkow: There seems to be some group of women here at the Institute that just stick with these problems. Now what group is this?

Dresselhaus: Yes, there is a group like that. Mary Rowe, of course, represents the central office. She does the day-by-day stuff. But this athletic thing was done really by other people. She was pulled into it, and was asked to be a member of the study group. But it was Sheila who really did it all. Without Sheila, the whole thing wouldn't

have happened. She organized it; she said, "You do this, and you do that." When Sheila says, "You do this," you do it. When I tell people, "You do this," they do it. There are a few women around MIT who can order other women and men around, and they get things done. Another woman who's done a great deal, but in a different kind of area--less in the student area, but much more in the employment area--is Vera Kistiakowsky. She's been very much into equal opportunity and hitting the departments hard about their appointments of women and minority members. She has been into equal opportunity for administrative assistants, and all of these issues. We've worked a lot with her on that, but she's been the leader of that whole type of activity. She knows more about statistics and everything like that; she's just a storehouse of information. She's fantastic in her sphere of influence. She has been less active in some of these other student-related things. I think the main reason is that she came into the act later. I don't know exactly when her appointment on the MIT faculty comes chronologically, but it comes somewhat later than some of these other programs that we're talking about.

Sherkow: What has your main involvement been in?

Dresselhaus: I was a co-founder of the Forum. At least, the early years of the operation of the Forum were pretty much as I had envisaged the Forum to be. But it was also my idea to pull out of the Forum in time and let the others run it. This happened about eighteen months after the Forum started. During the first eighteen months of the Forum's existence I was really working hard in getting that thing going. Afterwards, the

Forum was an obvious success and served the needs of a number of people; there was no possibility to serve the needs of everybody. You never make an organization that serves the needs of everybody. But once the Forum was off and running, there was no need for me to stick around anymore. This is now 1973--so the period from the start of the [Ad Hoc Committee Report] and the start of the Forum to the Gilman Fellowship--those years were largely devoted to putting the Forum on its feet and doing follow-up work on this [Ad Hoc report]. Because of this [Ad Hoc report], I was called in for many meetings around the Institute as an authority on "xyz" about women, and I call these activities, "follow-up." The students who were involved with this report, most of them were seniors and graduated shortly after the report was written, so they couldn't do the follow-up work. It was me who pretty much did most of the follow-up work on the Ad Hoc Committee report, and I also worked on the Forum. That took my time.

But in the fall of 1973, when I got this fellowship, I thought, it's time to start a new program. It was just like when I got into this Rockefeller Chair: I was looking for something new to do. When I got the Gilman Fellowship, it was like starting a new page and a new chapter in a book. The new programs were going to be something of interest to women, but they were going to be something different from what I had done before. To do something different, I had to let the others take over the on-going activities. There were plenty of people at MIT who could take over the Forum at that time; and so it happened.

Sherkow: Did you specifically apply for this fellowship and have women in mind?

Dresselhaus: Oh, I never apply for anything. I never applied for a job, so to speak, either.

Sherkow: How did this come about?

Dresselhaus: It came about in the following way. Before coming to MIT, Mary Rowe was a fellow of some sort at Harvard. She was involved in writing a proposal to the Carnegie Foundation for this program which involved supporting women at a number of institutions to do some work on behalf of women students or women--more generally, perhaps. The proposed program had in mind six universities. I don't know that the number was a fixed thing. But the proposal called for a program at six universities that would be instrumental in improving the status of women at these institutions.

When Mary was drafting this proposal, it seemed obvious that she would use me as a source of information because of my participation in writing the [Ad Hoc Committee] report. At that time, MIT had done more than any of the other schools on behalf of women. The content of this [Ad Hoc Committee] report became known around the country in the various other schools. Other schools got into similar studies as the [Ad Hoc Committee] report. The other schools wanted to know what we had done and how we did it, because changes at MIT did occur in many sectors as a result of the report and the changes were made in a very amicable way,

without fighting. It was just that the MIT Administration decided this was the right direction to move.

So Mary Rowe came to talk to me. She spent a number of hours with me, talking about this [Ad Hoc Committee] report and other ideas I had that were not contained in the report. Then she wrote the proposal. As the thing developed, she felt that if I would be a co-signer of the proposal, that is, if I would also be involved in the proposal itself in some way, it would help the thing get funded. Mary thought that I had experience and stature. So she wrote me into the proposal as a fellow. When the program was later funded, I found that I was a fellow. The program went on for about two or three years. I was in the first group of fellows. I was there to kind of guide the thing in its initial phase. I didn't apply for that fellowship. It was given to me, but I had a job to do in getting the thing going, and this I did.

But every school had their own little projects, and the other schools set up women's offices. They did a lot of work on counseling, and so forth. That wasn't anything that I had time to do. Most of the people who became fellows were more junior, or at least had a lot less technical responsibilities then I had. I never told anybody that I would change my MIT responsibilities to take on this assignment. I did, however, help to organize a program for the Gilman fellows.

But then again I felt as if I, myself, ought to do something significant for the Carnegie Foundation. Like for the Mauzé chair back in 1967, I thought that I should do something special. I thought I'd do something educationally special. Everybody else had their own little projects, but

these were in the counseling area. I thought we would start here at MIT a freshman course that would help women get into technical fields. I called the course, "What is Engineering?"

It became a freshman seminar. I taught it ever since the fall of 1973, when I started it. I taught it ever since the beginning of my tenure as a Gilman Fellow until this very last semester. I'm not teaching it now. Sheila Widnall, who was also involved with it during the first semester, took it over. I told her it was her turn. "I've done it for all this time. Now you do it." She was very happy to do it. That's the way we work together. She realized that I had taken on the responsibility for a long time and had achieved quite a following in that course. We enrolled about ten percent of each freshman class in that course. That's a lot of students. I thought the seminar needed some new inspiration; the same person can't do any course forever. So I gave her a good thing, and told her to "Go take it, and make it even better."

So that was one thing that I did as a Gilman Fellow. I think that the seminar has had a lot of impact on the Institute in a number of ways. I think it showed a certain area in freshman education that hadn't been receiving adequate attention. Freshmen need a certain amount of orientation on what the resources of the Institute are, in terms of research opportunities, facilities, departments, exciting people, how you get to meet them, how you get into a research project, and so forth. The format of the course, I think, has had implications in a number of areas, and I hope that more things like that should be set up and will be, because many students need that kind of introductory course as freshmen. For the women and

minority students, the seminar was very, very popular, because they needed it a lot more than the other students. In the early times when I taught it, and there were few students in the seminar, we used to have lab experiences. The kids would build Heath Kits, and they'd do welding and drafting. They'd have two or three sessions in a number of manual-type skills that technical people do. Normally, the girls had almost no previous acquaintance with these skills. There were also white male students who had no acquaintance with these skills. But when the numbers got large, the lab experiences disappeared. I had introduced something like this idea on lab experiences before. I was the coordinator of electrical engineering in IAP, during the very first IAP at MIT.

Sherkow: When was that?

Dresselhaus: I guess that was about 1970. I don't remember the exact year. In doing that program for the IAP, I got into what I call "how-to-do-its." I remembered that when I was a student, I had to learn how to solder and do plumbing and a lot of laboratory manual skills that I had never done before. I only really got into that when I was doing my thesis. I thought, "Gee, a lot of students should get exposure to that sooner." A good time to teach these skills was during the month of January, when the students were on board, but weren't too busy with formal courses. So I thought that the department should offer some how-to-do-its, along with a bunch of other things. Putting that kind of activity in the IAP made those things oversubscribed; we just couldn't get enough opportunities to satisfy student demand. I think

that we were the first department to offer how-to-do-its in a big way. This happened the year when I was organizing the IAP activities for my department. I don't claim real credit for the how-to-do-its, because I think anybody else could have thought of it. In time, the how-to-do-its got greatly expanded, and it's become a major thing of the IAP. A lot of students take advantage of the how-to-do-its.

I also introduced some how-to-do-its in my freshmen seminar. But when I gave the seminar in later years and there were seventy students per semester, there was no way to have how-to-do-its and monitor them. So I would suggest to the seminar student that they take how-to-do-its during IAP. There was plenty of them in IAP guide by that time.

Sherkow: What was the reaction of your colleagues to this seminar, "What is Engineering?"

Dresselhaus: It's popular with my colleagues. A lot of people know about it and send their students. I think most of the crowd that comes is due to students sending other students, telling them that they just have to take that seminar as a freshman, that the seminar really helped them through the MIT system. But colleagues liked the course. I used my colleagues as guests in the seminar all the time. I would invite my colleagues. There's almost not a professor at MIT who ever turned down an invitation to come. I would call them up and they would come. Some I would call semester after semester, to come and tell us about their programs, or we'd have a panel discussion or something. I organized the whole seminar, and it was my vision that made the thing fly. I figured out what topics we would have, and how we would address these topics,

what the format would be and whether we would have a panel discussion where the students would be involved, or I'd just have a professor guest, or whether I'd do the presentation myself, or whether we'd have a discussion only with the students in the class. I would arrange the agenda about what we would talk about at each class meeting. But I had to have a lot of guests because that seminar was an overload course for me. That wasn't my regular teaching assignment. That was a service to MIT. That's what service is; it is a lot of other things we've been talking about today, the things that you do in addition to what you're supposed to do in your regular job assignment.

Sherkow: I wanted to know, too, what was your colleagues' reaction to the women's work that you were involved in?

Dresselhaus: I've always gotten a tremendous amount of support on this from my colleagues. As a matter of fact, the only thing I ever get from my colleagues is, why don't you do more of this? Why I don't do more, is that my main job is being a professor at the Institute and doing my technical thing. Most of my women's work is done in the car pool, when I ride into MIT with Dotty Bowe; that's when we do our brainstorming. People come to my office for help. I see them, or we have this interview; this might be called a women's activity. But aside from that, I really do a relatively small amount of women's work, unless I'm working on a special project. Even special projects are relegated to a very small number of hours of the week. I don't spend a lot of time on women's affairs. I try to pick things where I can make a big impact with little time investment. That's my major approach.

BEGIN TAPE ONE, SIDE TWO

Sherkow: You were a founder of the Women's Faculty Luncheon. Could you just elaborate on why that was set up and what its purpose is?

Dresselhaus: That also had to do with this Carnegie program. The thing that I did with the freshman seminar seemed academic. I thought to myself, "Well, maybe this doesn't completely satisfy the function of the Carnegie program." It was so totally different from what anybody else in the program did. Everybody else had counseling-type activities. Of course, I don't have time for that, and I don't want to get involved in that. It seemed that maybe I should come up with some other ideas that I could implement. The time was 1973. That was one year after the Forum started, and a year after the Ad Hoc Committee Report.

The Administration had heard about our recommendations, and had heard the message that for women students to feel comfortable at MIT there should be more women faculty. We had demonstrated that women faculty were very active. Look, we did all this work; we did the Ad Hoc Committee Report and the Forum, and then we did our regular jobs besides. So the Institute, I think, at that time had a pretty good view of women faculty. We tried to sell the idea that maybe having a few more women faculty would be good for the Institute. There was also Affirmative Action. And there was Vera. She had a lot to do with hammering on the Administration on a more-or-less daily basis about the need for more women faculty. I think that the sorts of things that the Forum did or the Ad Hoc Committee Report did were to provide background information. These didn't provide a constant hammering. But with all the <u>different</u> pressures acting collectively at the Institute, the number of women faculty doubled just

around that time.

Previously, the women faculty members knew almost all of each other, because the numbers were so small. All of a sudden, we had so many new women faculty at MIT, few of us knew each other. Those of us who had been here before and were active knew each other. You see, not all of the women faculty were active; maybe only half of the total number was working on these women's issues programs. We said, "Gee, it would be nice if we could enlist some of these new people to help us share the load." So the Women's Faculty Luncheon was set up in a way to acquaint women faculty with each other and increase the impact of the small numbers. Even with the new additions, the percentage of women was still very, very small. To make our impact much greater than what one could have from these small numbers, we had to organize ourselves. Our Women's Faculty Luncheons served to exchange information; to tell each other about some of the programs; to help each other get ahead; if some people were having trouble in their departments, to give them advice on what to do next. The luncheons served a whole lot of functions of this sort. We used the money from the Carnegie Foundation to pay for the monthly lunches in order to encourage people to come. At $2 per person, and thirty or forty people per luncheon, the bill comes to about a thousand dollars a year. The Carnegie Grant paid for that.

After that was over, a large number of people who were coming to these luncheons thought they were such a good idea that we should continue them. So I have taken them over, and I pay for them out of my chair.

That was another thing that happened in that time. In 1973, I became

a permanent holder of the Abby Rockefeller Mauzé Chair, which gives me a little independent income. It pays most of my salary; it doesn't pay all of my salary. It pays a fraction of my salary, but there is also money available in the chair for other things. If I don't take some money for my salary, because I have research grants and whatever, I can then use part of that money for projects. The Women's Faculty Luncheon is one of these projects.

Sherkow: Are you funding this now?

Dresselhaus: Yes. I fund that out of my chair. I'm the only woman chair-holder at the Institute, so it seemed to me, as I'm the only one who has this kind of a fund available, I should support the luncheons. I think this is a good use of chair money--a thousand dollars gets a lot of mileage--so we are still doing the Women's Faculty Luncheons. Last year, Sheila Widnall ran them. This year I'm supposed to be running them. The year before, Vera Kistiakowsky ran them. It's got to be somebody who is a tenured faculty member who can run them because it does take time and organization. There is also the possibility of getting some guff if something goes wrong; you have to be in a secure position to answer back in these situations. We would let anybody take over the Women's Faculty Luncheons; there are no rules about it.

Sherkow: Something goes wrong--in reference to what or who?

Dresselhaus: Any operation--there's always something that goes wrong, and somebody has to assume responsibility and take the blame for mistakes.

Sherkow: What have some of the problems been revolving around?

Dresselhaus: I can't identify any problems that this particular operation has had. I've never been in any operation where something doesn't go wrong at some time. Some of the little things that may go wrong are when we get too many people showing up on a given day and we don't have enough food, or the opposite, we have too much food relative to the number of people. The meeting room could also cause problems. Suppose that we think that we're meeting in a given room, and we show up there and there's somebody else there having another meeting. There are all kinds of little things that happen.

Sherkow: What kinds of things do you discuss now at these faculty luncheons?

Dresselhaus: I think the best thing to do is to describe a series of recent agendas. It's pretty much the same as when we started. We have maybe six or seven lunches a year, when you add them all up; eight, I think would be the most. We meet once a month and during the summer months, for some reason or another, there are no meetings. There are timely topics, like admissions. Every year we talk about admissions, and we always talk in the beginning of the year about the new women students. We talk about special projects or programs. This year athletics will be a big issue because a lot has happened since last spring in athletics, so we'll have a report. Last year we did a series on tenure. How do people decide on tenure, and on what basis are these decisions made? The Women's Faculty Luncheons have topics of public interest. What it consists of are issues which are of interest to women students. Every professor

has to deal with students, so there are some common student issues that relate to being a professor. Then there are other things that bear on professional development. We talk about both of those types of things. We talk about plans whereby we can make our small numbers felt at MIT, such as in terms of admissions.

Sherkow: How do you now feel about the current status of women faculty members at MIT?

Dresselhaus: The status of all faculty members is tougher now-a-days. This problem has nothing to do with sex. This is a hard time. This is a time of declining income. Faculty have to do more work for less pay--that is basically the message. It affects women worse than men in a way, because the women are at more junior levels, so their jobs tend to be a lot more insecure and the probability of promotion into tenured position now is very small. It used to be much larger. Many more women percentage-wise are in non-tenured positions than men. Women are on the average in a much more insecure position at the Institute. I have no reason to suspect in any way there's anything unfair in the policy in operation at the Institute. Maybe they even go out of their way to help women.

Sherkow: What are they doing to alleveate this situation?

Dresselhaus: I don't know what they're doing. I don't think they're doing anything. I'm not sure anything can be done. Women have the same probability for promotion, if they're chosen on the same basis as men faculty; the probability that they get promoted should be about equal.

Consequently, in time, there will be a larger percentage of senior women faculty members just because it will work that way . . . (Interview interrupted) . . .

Sherkow: I had a question about this permanent holding of the Abby Rockefeller Mauzé Chair. Why was it changed from a nonpermanent chair to a permanent chair?

Dresselhaus: It wasn't really changed. They still have Abby Rockefeller Mauzé visiting professors. They found that there was a lot of money in that chair. On the visiting basis, the money was just accumulating. I think what also happened--I don't really know this in fact since I've never done any research on the Mauzé Chair itself. I've always promised myself I would do some research in the chair. This is one of the things that I'm going to have to live with for the rest of my life. I feel very badly about not having done such research. I think that the Institute possibly received some additional funds from the Rockefeller family, and that made it possible to have a permanent chairholder. In 1973, when I took over the chair, I had planned sometime to visit Mrs. Mauzé and tell her some of the programs I was doing on behalf of women. Before visiting her, I was waiting to finish a few things. Mrs. Mauzé was roughly the age of my mother, and looked a lot younger.

Sherkow: Is this eighties?

Dresselhaus: No, no. My mother is seventy-three, and Mrs. Mauzé, I think, was approximately a half a year younger. But they're very, very close in age.

I look to my mother as youthful, and the thought never struck me that Mrs. Mauzé might die before I had a chance to visit her. I have just been in the chair for a short time. I thought, "Well, I need a few years to really have a series of accomplishments, and when that happens I can go and make an appointment with Mrs. Mauzé." Maybe she would feel happy to hear what was happening with her money, and that we were doing some useful things. Until now, I hadn't really gotten enough different things done to make a nice presentation. One thing I wanted to do was make an evaluation of this freshman seminar. I wanted to complete that before I asked to see Mrs. Mauzé. Then I got news of her death this summer; it happened the day before I got my honorary degree from Worcester Polytech. It was on that day that the announcement hit the newspaper. Somebody told me about the obituary. I didn't even know about it myself, because I was rushing around so much to get out to Worcester for my degree; I hadn't read the newspaper that day. I guess it was the president of the Worcester Polytechnic Institute who told me that she died. That was the first I heard of it. It was a real shock to me. I felt so badly that I had never contacted her in her lifetime. It was like being a little ungrateful. Now it's all water under the bridge. I can't redo that. Seeing some of the Rockefeller brothers isn't quite the same. I don't even know that they would be especially interested in Mrs. Mauzé's programs.

Sherkow: How much does this involve per year--this chair?

Dresselhaus: The amount of money that goes to me is about forty thousand dollars. It's part of the interest income on the principal of the Rockefeller Fund. There's a considerable amount of that money that goes for other purposes. I don't manage the fund itself, somebody else manages the fund. I just manage the portion of the fund that's allocated to my chair. Then I also operate women's programs on that portion, as well as support my academic activities, that is, my salary. But I've always felt that some of that money should go to women's programs.

Sherkow: Some of it goes to women's programs, and some of it goes for your salary.

Dresselhaus: Most of it goes for my salary because my salary, employee benefits and other incidental office expenses use up most of the money. It pays for my telephone bill; my telephone bill is sometimes very large because of all the public service I do; most of the calls I make out of the office are long-distance, and that's expensive. That and postage--you'd be surprised, postage can be a hundred dollars a month out of this office. There are a lot of little things that add up, so that forty thousand dollars per year doesn't buy as much as you might think. Women's programs are relatively cheap because women's programs mostly involve ideas. I don't support salary of any women's program-type things. I don't think that such support comes under my job. But our thing is more of an ideas program. We get an idea, and we get volunteer help to carry out the ideas. That's the sort of thing my women's programs are.

Sherkow: You will always be having programs every year for women?

Dresselhaus: Yes, we always have programs of some sort.

Sherkow: Out of this fund?

Dresselhaus: Yes, yes. That's my vision of what a piece of the fund ought to be used for. It's also a fund for research programs. I use it to start new research activities, technical research programs having nothing to do with women, but with science.

Sherkow: How did you feel about becoming the permanent holder of this chair?

Dresselhaus: It came as a real surprise. I was called into Walter Rosenblith's office just before this all happened, and I was just about to go abroad, somewhere. I don't remember if I was heading off to Israel or to Japan but--that's right, I was heading for Japan. My appointment happened just before then. I was very, very busy getting ready for a long trip abroad. I had just been selected for the Radcliffe Alumnae Medal. I thought Rosenblith was calling me in to congratulate me. I came in there, and he congratulated me. I was thinking all the time it was for this Harvard thing. Then he started talking about something, and it didn't seem like the Harvard thing. But I didn't understand what he was talking about. So we had this conversation, and we were both at two completely different levels. After a few minutes, he told me more explicitly that this Rockefeller thing was going to be a permanent chair for me. Of course, I was very happy, but at the same time, the first thing that I said to Walter Rosenblith was that we can't really let that happen if it means that we won't have the visiting professor appointments any more.

I remember saying that to him, that it was very important for the Institute to have this program of women visiting professors. He assured me that that program would still continue, and it has continued, in fact. That program has not been interrupted. They just have additional funds to take care of the permanent chair of the visiting professor program.

Sherkow: There are two other activities listed on your vitae which are women-oriented. Maybe we could just quickly discuss them. One you indicated was counseling, and the other was talking to women's groups.

Dresselhaus: The counseling is that students come over and talk to me. That's a one-on-one thing, and the student makes the appointment. I consider it part of my MIT job. A lot of the MIT women students at one time or another feel that they have to talk to somebody who is a professional in some field, so they make an appointment and talk to me. That's what I call counseling.

Then I have another kind of counseling where faculty members have a problem in their laboratory or in their class or some situation that involves a woman student. They want to have some advice on what I would do if I were in their position. It's a case where they don't feel comfortable about something, and they're not sure whether they are going to do the right thing by instinct. So that's a kind of counseling.

Then I have another kind of counseling where I have parents or people that call me about their daughters. The typical thing is Professor X has a daughter who is good in science or interested in science, and until this professor metme, he never considered sending her to college to study

science or engineering. He wants to know, "What do you think about it?" You'd be surprised how many calls of this sort I get. It's a very typical call; I get it from people at MIT, and I get it a lot from people outside.

Then I get counseling calls from other universities that are getting into some kind of women's program. Typically, this university is now attracting many more women students in some area, and they want to know what our experience at the Institute has been in one regard or another. I'm recognized as the authority.

Sherkow: How do you feel about getting all these different kinds of counseling requests?

Dresselhaus: Somebody's got to do it. I'm an obvious person because I'm in the news. People read about me in the newspaper. In fact, I get a lot of calls right after there's been an article about me in a major newspaper in some connection, usually having nothing to do with counseling, but having to do with something in science. And they say, "Oh yes, well here's a woman scientist. I have this and this problem." They then make the connection and call me. But this happens to a lot of people around the country at once. So all at once I get a whole bunch of phone calls, and then it sort of dies down.

Sherkow: You're really a role model, an active role model.

Dresselhaus: I guess that I am a role model. You try to be polite, but you don't have too much time to talk to all those people because if you're

too polite, you wouldn't get any work done. So you're polite up to a point, and then you let them know when the time has come for the conversation to be over. I have learned how to do that pretty well with people. I let them know when their time is over, and we have got to go on to something else.

Sherkow: Does that indicate to you that there might be not enough women is similar positions as yours?

Dresselhaus: Oh, oh absolutely, because I get just too many calls. I wish there were a few more people with whom I could share some of those calls. Yes. I'm so easily identified that I get more calls than I would like to answer in this area. Somebody's got to answer them. I feel that you have to be polite. So I am polite within my time constraints, but the conversation is finite in time. Some days, the conversation is pretty curt because I'm just too busy to talk.

You asked for one final thing--yes, I'm invited to speak at a lot of different functions. I call it Women's Lib, but it's not really lib. It could be on an issue of educating women in engineering and some of the things that I've done at MIT, like the Forum. I might be invited to talk about the Forum at some place that might want to set up their own Forum. I do get quite a few invitations like this per year. I limit those; to these I do say "no" frequently. I don't accept anything like all the invitations I get. I accept less than half of them. I accept those that seem the most interesting, and those that are close to home, where traveling is minimal, get preference. When there's traveling involved,

unless it's really very important or urgent and I feel that there's almost nobody else that could give the talk, then I go. Money is not so much an issue, although I do expect people to pay my expenses for traveling. I don't ask them to pay for my time. But if people are freeloading on me then I [say no].

Sherkow: What do they usually ask you to talk about, and what do you usually accept?

Dresselhaus: There are a variety of topics. I give only off-the-cuff lectures of talks in this area. "Talks" is a better word than "lectures" because I don't have the time or interest to prepare talks in these areas. I remember giving some talks for the American Association for the Advancement of Science, the AAAS. They had a symposium here in Boston last year. In some ways, it was embarrassing in a way that I was one of very, very few speakers who didn't really prepare a talk. I felt I just don't have time to prepare talks like that. I gave two talks at that conference, and both were from just little tiny notes. It was very much impromptu. I thought that the talks went over just as well as they would have if I had prepared for several hours. Maybe the talking would have been a little smoother if I'd put twice as much time into them, but I don't mind giving a spontaneous talk. The kinds of subjects that I'm asked to talk on include the education of women in engineering, some of my own career experiences, like biographical things, and then public issues of various sorts. Those are the hardest, because they're harder to do on an impromptu basis. For these, I have to make myself an outline beforehand.

But I don't write out the talks in these cases. I just give them impromptu from a very rough outline, for better or worse.

Sherkow: Which ones do you usually accept?

Dresselhaus: To me, it makes no difference if I'm never invited back again, because I'm not especially anxious to give these kinds of talks.

Sherkow: Why is that?

Dresselhaus: It's a question of time. I can spend all my time giving these kinds of talks. That's not what I'm paid for here at the Institute.

Sherkow: Then which ones do you usually accept, and why?

Dresselhaus: I try to accept those that I think will make some impact, where there'll be a large audience and also in cases where the number of people who could give the talk is very small. You just can't say no to these, because then the talk couldn't be given. You can't do that, if it's something that's important. For example, I was asked to give a talk to department heads in engineering schools. There is a national association of department heads for engineering schools. This talk was about teaching women engineers. That's an area where there aren't too many people that can be asked to give a lecture, and it's an important talk to give; so that's one that I'd accept. I don't plan the talk, however. I just go, get up, and give the talk. But I do think that I have to give talks like this. Then there are other talks that are biographical, which are just of public interest. There are also other people with biographies, so I turn those down usually.

Sherkow: It seems to me that one of the great uses of a person like yourself would be to talk to women who are in junior high school or younger.

Dresselhaus: Yes. Maybe that's so, but there's just no way I can fit that kind of talk into my schedule. That's out of the question. As far as I'm concerned, there are oodles of other women who can give that talk equally well, and they do so. The Society of Women Engineers has a program visiting high schools. To high school students, one engineer is just as good as another. To them it doesn't really make too much difference that I am an MIT professor. Being an active participant in the field is what's important to them. So, that is one thing I never accept--talking in high schools. I just can't do it. As a matter of fact, very few faculty women here do that either, because we don't have time for that. But there are a lot of other people who are in the engineering field and do have time to give such talks.

Sherkow: What about guidance counselors. Do they make requests?

Dresselhaus: All of these people make lots of requests, but guidance counselors are like junior high school students. It doesn't make any difference to them, one engineer or another. It makes little difference. We have had at the Institute some programs now and then inviting high school students and junior high school students for visits. These mainly concern women students interested in science and engineering and take the form of career workshops. We've had that type of workshop a number of times,

and I've tried to participate in them as best I could. I've been helpful. I've attended them. I've given talks at them and been on panels for them. I can do that kind of assignment because that's only one hour during the day. For the type of high school talk where you have to travel somewhere, you easily spend the whole evening, sometimes a whole day. I don't have an evening to give to that, so it just doesn't happen.

Sherkow: What are you actually doing now in terms of women's issues and women's concerns? You mentioned the faculty luncheon that you're running this year.

Dresselhaus: Yes. That's the main thing I'm doing this year. I just stopped teaching the freshman seminar for the first time. I might be getting into something new soon. This is the way it all happens. Right now I'm catching up on a lot of other things. I will get into something else eventually. I don't know what it is. I haven't identified the next need. My style isn't moving from one thing to another. Maybe you, as a biographer, are looking at this aspect of my career and feel that I should have a women's program in progress all the time. I have some women's programs all the time. This thing that we're doing now is a women's program in a way, right? Aren't these interviews part of a women's program? It competed for time I could give to women's programs.

Sherkow: I guess you could call it that.

Dresselhaus: I'm putting in some fraction of my work week into women's programs. An hour a day, I think, would be a fair way of saying what I put

in during the normal [week]. So that's over ten percent of my time. I think that's fair. I'm always doing counseling and little things that come on their own to the office. Getting into a major program is more of an investment in time. I don't necessarily have one major program all the time but I think you can count on me to develop one in time. I've just not identified what's the most pressing next need. In connection with this Carnegie Fellowship Program, I did a lot of work with the other universities at that time in trying to help them with their programs.

Sherkow: In this area?

resselhaus: Yes. There were six universities that were involved in the Carnegie program. One thing that grew out of that program was an identification that the smaller schools needed help from us in terms of faculty development. Here at MIT, professors are very autonomous. We have tremendous power at the Institute. This is also true at Harvard. But take the other colleges in this area; professors have relatively little power. How that happens has a lot to do with the relation of the faculty to the administration. But it's also the view of the faculty of themselves and their national stature and various other factors. Faculty development is an important issue, and I have been interested in faculty development for the other schools. I have had some ideas on how to implement professional development. I haven't had time recently to do as much as I have been doing with women's programs in previous years. But now that I don't have my freshmen seminar, this might be the year that I do something more about professional development for other women faculty.

This idea involves getting together some group, a consortium of universities within driving distance of Boston; getting representatives of women faculty, like one or two from each of the schools, and having a monthly get-together, where we try to figure out ways that the women can help themselves, augment the women's programs at their institutions, learn about programs at other institutions that could be adapted to the needs of their institutions, etc.

Sherkow: It sounds like a good idea.

Dresselhaus: I noticed the need for such a program when I was doing that sort of thing in the Carnegie Program. I remember one time giving a presentation about getting research money. These people think in terms of getting research money on the level of five or ten thousand dollars. The unit around MIT is a hundred thousand dollars. We raise a lot of money at MIT to keep our research programs going. I gave them a little spiel about how having a research program of some size with research associates and graduate students and all of that made an impact on the administration. When you bring in lots of money, you can get away with more.

I think the reason that the women's programs at MIT work as well as they do is that Sheila and I bring a lot of money into the Institute as research funds. Both of us have large research programs. Women's programs are to us just another small little research program among many, and we view it that way. Because of our other programs, we have a good deal of respect from the MIT Administration. It's not that we're unique. All of the professors around here bring in a lot of money. That's our way of operation. And this gives us a certain amount of autonomy. When we say something, the Administration tends to listen. At the other schools, these women don't get anybody to listen to them. One of the

main things I think I was doing in this Carnegie Program was trying to give people some ideas of how to make the men at their institutions listen. We don't have that trouble here. We talk, and the men listen.

Sherkow: When you indicate being able to get research money, do you currently have research money for women's programs?

Dresselhaus: Oh, no. I never got a penny via the proposal route for research on women's programs. Oh, no.

Sherkow: You're talking about your own research?

Dresselhaus: Yes. I don't know how to get money for women's research. As a matter of fact, I've tried to get money for research on women's issues. I'm good at getting money for science, but I don't know how to do it for women's programs. The people that evaluate the proposals expect me to put a lot of my time into the women's program. I am willing to put about five percent of my time into such a program. Then they say, "Well, nothing will get done." But, I don't have more than five percent of my time available for research in women's programs. We get a lot done in five percent of our total time. People evaluating proposals on women's programs don't understand how a technical person operates. They don't have many people applying for women's programs who have technical backgrounds and have technical jobs. They don't realize that I can't spend twenty percent of my time, or thirty percent or fifty percent working on behalf of women. These program directors expect <u>big</u> chunks of my personal

time working on the project. I just want to have my ideas implemented and we get that done. I don't have the vision of personally making all the phone calls and writing all the letters that would be involved in doing a women's program.

Sherkow: That's a lot of time.

Dresselhaus: I don't want to do the interviewing--I don't like that. Therefore, I don't get into a project like that. The funding agencies don't understand my operations. I've written proposals for women's programs, but I've never gotten a penny of support. I've never gotten any outside money for women's programs. However, I do get another kind of money from time to time. I can raise fellowship money. That's another thing: maybe this is going to be my fellowship year. I know I can raise a lot of money for women's scholarships and fellowships.

I once gave a talk for the MIT Corporation Wives. I was invited to give a presentation to them. This was another talk with no notes; I just went over there and talked. I was telling them about some of my women's programs. Then I thought, "You talk to these people. Why don't you tell them what they can do for you. This is just what you did. Now you can do something for us, too." That was the gist of my message, in a nice way, of course. I mentioned that what we needed here was money for beginning women students in the graduate program, particularly for those who had a little bit of an atypical background. Out of that developed the Ida Green Gift of a million dollars for fellowships. I know that I can raise a lot of fellowship money of that sort because I think I know

how to do that. It's a question of finding time and talking to some of the right people. There is money around for women's fellowships. The people with the money don't often know where it is most needed and some of the people that maybe know better where it's needed don't have the time to talk to the people with the money. So that might be an area that I work in next. I have some potential patrons. It's just a question of talking to them. Talking to them is more than spending an hour; it's several visits per client.

Sherkow: Which funding agencies would not give you money for proposals?

Dresselhaus: Oh. One was an MIT faculty program. I've applied to the NSF and Ford Foundation and been turned down. The thing with the Ford Foundation is they had a fellowship program for women to work on a women-related project. I wanted some money to do a women's project while I was doing my other things. I couldn't get any money for that. Then I tried NSF, and they turned me down. So I have applied to those places, and maybe I've even tried some other places, but I've never gotten any money for women's activities. I don't really understand why not, because I think the various agencies give money for such junky things. I'd like to think that my programs are a lot better than ninety percent of [what they fund]. Women's programs, or at least my women's programs, don't cost much money, but I've had to fund all my women's programs, either through my chair or through the Institute. But they don't cost much money. They're really very cheap. I've never had a costly program.

Sherkow: I was wondering when you really got involved in women's issues. How have your ideas evolved?

Dresselhaus: I was very conservative, I think, in the early years. The thing that made a big impression on me was the Women's Forum. Some of the Forum projects have made an impact of my other projects. Doing the projects has also made an impact on me. My thinking about women's issues evolved and changed and developed as I got more and more experience. The main things that changed and sensitized me, and educated me, was doing that Ad Hoc Committee report and founding the Forum. Those were the main things. The other things have been corollaries to those main theorems.

Sherkow: But you saw yourself as rather conservative in your beginning years as a professor here?

Dresselhaus: Yes. I got less conservative with time. When I first came to MIT I was, I think, a very conventional housewife-type. Conventional housewife that wasn't very good at housework. (Laughter) That's not true. I don't have time to do housework up to my standards, but I don't let it upset me.

Sherkow: Was it listening to the people who came to Forum and working on this Ad Hoc Committee and realizing that people had different experiences that changed your mind?

Dresselhaus: Up to the time of the Ad Hoc Committee Report and the Forum, I always figured that women could take care of themselves. I overlooked, in a way, all the help that I got along the way. I wasn't really sensitive

that women had to help other women, and that many women needed help from other women to get along. Whether or not in my past I have received a lot of help from women or not is a little hard to evaluate. But I wasn't conscious until this period that for many women in the professions, help from other women was essential for getting ahead. That was the main breakthrough in my thinking. I don't know if you call that conservative or liberal, or whatever. But up to this time, I was just minding my own business and doing my own thing. After this experience I realized I had to help other people. It was not so much that I expected help in return, because I had already made it, in a way. Now it was up to me to help the others.

--END OF SESSION--

MILDRED DRESSELHAUS

June - -October, 1977

Part III

Women in Science and Engineering

MC 86

Oral History Collection

MIT ORAL HISTORY PROGRAM

Project on Women as Scientists and Engineers

Interview with Mildred Dresselhaus by Shirlee Sherkow

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Session 8 transcribed by Janet Billane

Sherkow: Today is September 24th, and I am interviewing Mildred Dresselhaus in her MIT office. I thought we would begin today with your summer jobs. You've had three summer jobs in foreign countries. Maybe you could talk about why you went there and what you did there, beginning with the first one in Brazil, 1971.

Dresselhaus: The summer jobs are really a continuation of the work that goes on on campus, in a way. Over the years I've had a number of invitations to be a visiting professor at various places. However, with the children being small, it was very difficult to make a move like this. The first time we went abroad corresponds to a time when I had an invitation and I thought that the family was in a position to travel. To accept a summer job away from home requires some kind of major move. Either I go by myself and leave everybody behind in Boston, which is unacceptable, or we all go. When the children were small, the idea that we all go abroad

was too much of a hassle, in the sense that one person would have to be at home taking care of the kids or making arrangements for them. When the children were small, both adults were not in a position to work away from the home base, so the first year we went off somewhere was the first time that we both had an invitation and we thought the kids were manageable enough so that they could get along to first order by themselves without too much babysitting.

Sherkow: Were you and your husband working together on a project?

Dresselhaus: Well, yes and no. This one in Brazil, which was the first time we went abroad as a family, marked the time that Brazilian science was trying to get a big shot in the arm. This was the beginning for them, when they first got a big commitment from their federal government for science. Previously, Brazil had a scarcity of people who were highly trained. The idea of bringing us to Brazil was for us to be visiting lecturers. We both gave courses at a kind of summer school for all Brazil. The Brazilians brought people in the solid state field from all the various universities to this one campus, Campinas, and they all lived there. The students in that course were both graduate students and faculty members. It was a mixture of that kind. The students were of all ages.

I gave some lectures that were like a course I give at MIT. I gave a course on optical properties of solids. My husband gave a course on electronic structure. That was basically what we did. The format was many lectures per week. I think we gave six or eight one and a half-hour lectures in a week with problem sets that one of the local people graded.

Then they made up an exam that was given after we left. At least the graduate students got credit for this as a graduate course.

Another aspect of our appointments was to interact with the research program that they had at that university and to travel around to other universities and talk to the various people doing things in all the other schools. The attraction for me was that I hadn't been to South America before. It was also in some sense do-gooding. It was an extremely interesting visit from the sightseer and cultural point of view.

--[Interview interrupted]--

Sherkow: Could you explain how you received this position?

Dresselhaus: It's pretty easy. With most of these visiting appointments, you get invited by somebody who knows you. The Brazilians were planning this summer school, and they were planning to invite a few different people to lecture at this summer school. I think part of the reason that I was invited is that at MIT we've had a series of Brazilian graduate students in the Electrical Engineering Department. All of the Brazilian students who worked here in this building took my courses and thought that I could give something similar while in Brazil. When our foreign students leave MIT, they become big shots in their own countries. So the MIT graduates, the people that got their PhD's from our department, became leaders in their institutions abroad, and they were instrumental in inviting appropriate MIT people to their institutions. The people these Brazilian students knew were the people at MIT. So that's how it happened that we got invitations to lecture in far-away places.

Sherkow: Did they know your husband, too?

Dresselhaus: Oh, yes. We could both give the kind of lectures that they needed at that particular time. They invited about four lecturers to this summer school. We were the only two people from MIT. Of course, I gave the lectures in English. One of the lecturers gave the lectures in Portuguese; that made it a little easier for the students.

Language turned out not to be a very big problem. One thing that I did for the students that they found useful was to give them lecture notes. I gave them lecture notes because I had them from my MIT course. We just typed them up nicely. At that time, all the notes that I had for courses were handwritten, but on the occasion of going down to Brazil, we typed up a set of notes to make it easier for the Brazilian students to read. I also paid a little more attention to getting some nice diagrams and figures into the notes. When I got back to the Institute, I consequently had pieces of courses that were in nice typed shape. So I then made typed notes for the remainder. The topics I didn't talk about in Brazil I had typed when I got back to MIT, so I have now a collection of some very nice typed notes for at least a few courses.

Sherkow: In terms of your children, who took care of them while you and your husband were lecturing?

Dresselhaus: They took care of themselves. By that time, the oldest was about thirteen, and she was in charge. We had a Brazilian babysitter, but she spoke only Portuguese, and the kids didn't understand a lot of

Portuguese. In fact, they understood very little Portuguese. Household help in Brazil is very easy to come by, and you can get very good household help. It's also very inexpensive; because the households have no facilities, no electrical appliances or gadgets, one needs household help. Like for example, there's no way to wash clothes except to do them completely by hand. Dishes are all done by hand; you even heat your own water. Housework is kind of at that level. If you want to have a job and do something other than housework, you must get somebody to help you in the home. In this country, you can get by with minimal household help. We never had very much, but in Brazil, I really needed somebody to help me with washing clothes and dishes, and also shopping.

We lived so far away from anything--we didn't have a car--that this maid had to do everything for us. She got us food and prepared it, and did the dishes and washed the clothes. The amount of work that she could do in a day was just absolutely phenomenal, unbelievable. I always considered myself as a person that's very fast. I'm fast in housework, as well as other things. She just had me completely beat. I've never met anybody like her. I don't know if this is typical of Brazilian maids, but she was certainly good.

As far as taking care of the kids, they took care of themselves a lot. We lived on this big estate, enormous by American standards. It was, maybe, a twenty or thirty-acre farm, and we had a horse and everything you could want in terms of garden supplies and trees and bananas and mangoes and avocados and all kinds of a variety of tropical fruit. I don't even remember most of the names. We had a lot of things. We had a big

swimming pool that took care of the kids. They spent half of the day in the pool and the rest of the day fooling around with different things on the farm. There was also a man who took care of the farm. We didn't have to do the farming; somebody kept up the grounds.

Sherkow: How old was your youngest child?

Dresselhaus: About seven or eight. He fit in very well. The children just loved that experience. They look back at that summer as one of the high points of their youth. In reality, there was always somebody sick. We weren't used to the bugs in Brazil. We had lots of intestinal flu; they must have gotten flu from the water. Water is not awfully safe in Brazil, and the vegetables are not safe. The fertilizer that's used also contains a lot of harmful bacteria. So it seemed to be very easy to get sick down there. The kids were always sick, but they would be sick for a couple of days, and then they'd recover. It was the way of life down there. The Brazilians always seemed to be sick, also. (Laughter) So it wasn't that we were different. Everybody seemed to have flus and colds, and this and that.

Sherkow: Was there adequate medical facilities?

Dresselhaus: People take all these things pretty much in stride. We didn't pay too much attention to doctors. As a matter of fact, when we got back to the U. S., we came back with two sick children; one with an awful-looking skin disease, and somebody else with some kind of tropical intestinal disease we thought had to do with some kind of worms. We took the kids to the Harvard School of Public Health. They have some tropical disease experts there. The kids don't remember anything about the diseases. They only remember the good things about Brazil.

Sherkow: What was it that they liked so much about this summer?

Dresselhaus: They liked the traveling. We went all over Brazil. We did a lot of traveling. Of course, Brazil is an enormous country; it's as large as the U. S. Obviously, we didn't see anything like everything there was to be seen. There's certainly a lot more that we haven't seen than what we did see. On weekends we would travel.

Part of the job was to travel around to the other universities, and the places were very far apart, distances like between New York to California. It's like that all the time when you're traveling around in Brazil. It's like that, but it's also different. Here when you travel from place A to B, there's frequent service--say air service, or whatever. Our country is geared to a lot of travel. Down there, of course, only the very, very wealthy travel. So there isn't frequent service, and it isn't of the same caliber. Traveling turned out to be something that you had to plan much more carefully. They had schedules, but the planes were always advertised to be full. But when you actually had to fly, that is the day of the flight, there was always space available. So you had to learn to do it the Brazilian way and to plan that you were going to go from place A to B with a stopoff at place C, with no reservations. Then you just go to the airport, and all of a sudden a place on the airplane would clear about five minutes before the plane took off, and then you'd be off and running. But you didn't know in advance if you'd be going or if you wouldn't be going. Many foreigners can't react very well to that, especially when there is only one plane going between place A and B per week.

But we learned to do it in the Brazilian way and not worry about schedules. Now, the reason that you worry about schedules is because the next flight out is next week. It isn't like you miss a flight because it's all booked, that you can go two hours later. You just wait in someplace off in the sticks, completely out of civilization, for one week, waiting for the next plane to arrive. There's no road transportation. You simply can't go through the jungles by road.

Sherkow: So you took your children on these long journeys?

Dresselhaus: Yes. Oh, they went everywhere.

Sherkow: Were they exposed to your teaching?

Dresselhaus: Oh no, no, no, no. They stayed at home. In Brazil, for example, we lived about one hour by road from the university. So it was a big to-do to get to work in the morning. We had a chauffeur who picked us up.

Sherkow: I thought when you indicated that you went lecturing around the country and you brought your children with you, that they might be exposed to your teaching.

Dresselhaus: They were exposed in the sense that while we were teaching they would go off sightseeing by themselves, and they would meet us at an appointed place and at an appointed time around the institutes. They got pretty good at going off to zoos and exploring Brazil by themselves, finding the way back--without knowing the language--finding their way back to where

they were supposed to meet us. I always found it pretty amazing how they did that. They seemed pretty relaxed about it.

Sherkow: How do your children feel about the fact that you work?

Dresselhaus: I guess, at times, they would like to have me home all the time and not so busy, but I think that they are pretty well tuned into it. They like a lot of the aspects of my job. As for example, they like this travel aspect about it. They're so used to seeing me doing homework at home; so when they do homework, we all do homework. I'm just part of the homework gang.

Sherkow: Do you think their ideas have changed about working mothers because of you?

Dresselhaus: Oh, I think so, yes. It's got to be so. Each person forms opinions by his or her surroundings. If you see working mothers, I think you're more apt to accept them than if you are used to being pampered. Our kids have an awful lot of responsibilities since I'm working. They make out very well; I think they benefit because of the responsibilities.

Sherkow: Let's move on to the second foreign place that you went. It was the Israel Institute of Technology in 1972. How did you receive that position and what did you do?

Dresselhaus: There was a fellow who used to come from the Technion to the Magnet Lab every year. His name was Joshua Zak, and he was friendly with us. At the Technion in Israel, they're always having visitors. They have many visitors there at a given time. Every year there's a few of them.

We were invited to be such visitors.

Sherkow: Because of knowing this person?

Dresselhaus: We also knew a lot of other people there. When we got there, we found that we knew about one-third of the people before we ever arrived, and they knew us.

Sherkow: From teaching?

Dresselhaus: Our business is international. The research activities are international. People get to know other people through their publications and talks at meetings and whatever. So I knew a lot of people at the Technion already. My formal duties in Israel were very, very slight.

Sherkow: What were they?

Dresselhaus: I just gave a very small number of lectures, whereas in Brazil I worked very, very hard. In Brazil, we were constantly busy. In Israel we had relatively modest duties. The Israelis didn't pay as much salary, either. They paid our salary while we were there, but as I remember, we had to raise some of the travel expenses ourselves.

Sherkow: Why did you take this position?

Dresselhaus: To see another part of the world and talk to different people, and also to get away from MIT. I never had been to Israel; it was an interesting opportunity. Oh, it was a great opportunity. We had a wonderful time there. The kids liked that trip even more than the one to Brazil. I don't know which, looking back at it now, they think was the

best because they liked them all. Professionally, there was more in going to the Technion than to Brazil because the Technion is a first-class place and a lot of very smart people are doing very good work there.

Sherkow: What were you doing there exactly?

Dresselhaus: Just doing my own research and talking to the people whom they had there, and these people were interacting with me.

Sherkow: It wasn't the vast lecturing that you had done in Brazil?

Dresselhaus: No. I said I had almost no duties; I gave several lectures, but that was it.

Sherkow: What about your husband? What did he do?

Dresselhaus: He did the same thing.

Sherkow: You were working that time on the same research problems?

Dresselhaus: Oh, I don't remember that we were working on the same or different ones, or some of the same and some different. The position at the Technion was a research position to do whatever we wanted to do while we were there, and interact with the people that they had there in whatever capacity they wanted to interact with us. That was what the job was. We were there in the summertime, so they didn't have much opportunity in the way of formal classes; there wasn't much opportunity to do teaching. There weren't many students taking courses in the summer. They just had the research students there; it's like coming to MIT in the

summertime; you wouldn't teach. Very few students go to summer school.

Sherkow: In both of these instances, you and your husband were asked over?

Dresselhaus: That's because we could only go together, and so they asked us together. Each place could use us both, so they made a package deal for us.

Sherkow: Did either one of you ever consider going by themselves?

Dresselhaus: Oh, no. We wouldn't. That's too long a time to be away from the family.

Sherkow: From the family?

Dresselhaus: Yes. I think so.

Sherkow: The third summer, 1973, you were in Tokyo. What was the arrangement there?

Dresselhaus: The arrangement there was as follows: I had a U. S.-Japan Cooperative Research Grant from the NSF. I had a counterpart, Professor Tsuzuku, who was at Nihon University, and we were supposed to be working on a joint project. We were, in fact, doing so. I had an NSF grant that had funds in it for my travel to visit and talk with Professor Tsuzuku and interact with the research going on there. And he also came to MIT for an equal length of time. I went there one summer, and he came here the summer before.

Sherkow: How did you receive that grant?

Dresselhaus: Just the way you receive all grants. You apply. I found out about these cooperative research grants when I was in Japan previously. I was invited in 1970 in connection with an NSF-sponsored workshop. At this workshop they had ten Americans and ten Japanese. It turned out that at the conference there were maybe fifteen Japanese and maybe five foreign observers who were neither [Americans] or Japanese. We all got together for about ten days of intensive talks covering the whole graphite field; I was one of the ten U. S. participants. Through that exchange program, I learned that they had these cooperative research grants which were available for joint research. So I mentioned that to one of my colleagues in Japan, and we agreed to apply jointly, he from his end to the Japan Society for the Promotion of Science and I in my end to the NSF. We both applied, and we got this joint grant. Under that grant, I sent over one of my students to Japan for about a half a year, and he sent over one of his students to MIT for a full year. Then he came here for a month, and I went there for about six weeks or two months, something like that.

Sherkow: Did you go by yourself that time?

Dresselhaus: No, we all went. Well, the first trip, the ten-day one, I went by myself. But the second one, the summer one, we all went. So we made arrangements. I went to visit Nihon University, and Gene then made an arrangement with one of the other universities, Tokyo being a big place. So between us, we got two different deals; this permitted us to go together as a family.

Now what happened in reality was a little different than the plan. Japanese these days have small families and small apartments. So to get an apartment that was big enough to accommodate the whole family--because our family was bigger than the average Japanese family we couldn't live in the guest house they had at Tokyo University--I had to take on an additional job to be eligible for housing. That's how I got a job at Aoyama Gakuin University, which is another university in Tokyo.

Sherkow: What were you doing there?

Dresselhaus: I had to become a member of the faculty to be eligible for their visitors' housing. They had a big apartment that was big enough to accommodate our whole family; so that's how they got me as a lecturer, and I gave a course for them.

Sherkow: Your husband worked at a different university?

Dresselhaus: Yes, but we all lived at Aoyama. We had an apartment there. We lived right in the college. As a matter of fact, the apartment was where the women's dormitory was. The kids lived in the apartment right in the college, which turned out to be really, really useful. It turned out to be the best possible arrangement. We didn't know how good the arrangement was when we made it. It turned out to have a lot of advantages. The two of us would go off to work in the morning at these other places. Some days I would be at Aoyama Gakuin University giving lectures, but the place where I gave these lectures was real close to our house. It was very convenient.

Sherkow: What was so useful about it?

resselhaus: What was so useful about it is that every university has a cafeteria, and this university also had a cafeteria. So the kids could go down to the cafeteria for lunch and buy their lunch. They learned to do this right away. They learned to order food so that the people there could understand what they wanted. For them, that was a big adventure, to go to a Japanese restaurant by themselves and order food. They got so that they tried out every different dish that was served at that place.

Sherkow: Did you have any housekeepers or babysitters that summer?

Dresselhaus: No, we had nothing. Nothing. But what happened there was that English-speaking children were in great demand by the Japanese students who are very anxious to practice English. Just about all Japanese students study English; it's their foreign language, so English is taught in essentially all schools. However, it's usually taught by Japanese, and they have very bad accents. The students were delighted to have native speakers around on whom they could try out their English and also learn some English slang, and whatever. There were always students who came around to engage them in a baseball game, or different games. They just wanted to have our children around so they could talk to them. The students at Aoyama Gakuin University didn't work as hard as at some of the other places, or maybe it was summertime and people had a lighter load.

Anyway, the kids had a really, really great time. At the university they had all these playing fields, so the kids could play baseball and

tennis and other things. The fields and facilities were right in the backyard. When the children started playing some game, there would always be some Japanese people who came and joined them right away. The Japanese were very friendly.

Sherkow: Were you the one who was responsible for taking care of the house and laundry?

Sherkow: Yes, but in Japan that was very easy. Of all the places that we went, the household operation was the easiest in Japan. We lived in this university apartment. Japanese have a lot of gadgets in their houses. They're like Americans that way. There was a washing machine in the house for washing clothes. We didn't have a dishwasher, but it was really very easy to wash dishes. There was always hot water. The clothes washer was a miniwasher; you put in two or three things at a time. The kids got so that they really enjoyed washing clothes, and they got so they would do washes by themselves. It was like a toy, it was so small. That's what Japanese use, themselves, to wash clothes. Everything there is on a smaller scale; it is so, because their apartments are so small and they need very small appliances to fit into their apartments. But the kids had a real charge out of using these mini-machines.

Sherkow: Was part of the incentive of going to these foreign countries the fact that you knew your children would enjoy it; it would be a new and exciting experience?

Dresselhaus: Yes. It was also an exciting experience that I would enjoy.

We all had a good time. I enjoy a certain amount of travel. It's a lot more interesting living in a place than just visiting for two or three days. We tried to get into the swing of these different places when we were there.

The easiest place to have gotten into the swing of things would have been Brazil because Portuguese is a lot easier to learn than these other languages, Hebrew or Japanese. But Brazil was the first foreign country that they really went to, and the kids weren't too acclimatized to what a foreign language was and the need for learning it. So the second year, when we went to Israel, they got more into the swing of things and had a little bit more appreciation of the fact that to communicate with people, you had better learn a little bit about their language. So we all took some Hebrew lessons while we were at the Technion. I think it was really token language study; I don't think we learned a whole lot. At least the kids thought that they were learning something, and the little that they did learn helped them a lot in getting around.

We had no household help in Israel, and the kids went around <u>everywhere</u> by themselves. They went for long trips by themselves, and I mean very long trips, two-hour bus rides, and so forth. They got around really by themselves. Israel is the safest country in the world to let kids go places and do thing. Children are very independent in Israel. It's true that there's terrorism of sorts in Israel, but there's also a very low crime rate, or almost a nonexistent crime rate, so you don't feel too apprehensive about letting your kids go out to do strange things. Even though they didn't know the language, except for the few words that they learned at their lessons, it turned out that there was always somebody

around, somewhere, that knew English, because the Israelis are fantastic linguists. People were concerned about children; it's like kids run Israel. It's a real children's country. If the children had troubles or they got lost and they couldn't find their way, or they were crying somewhere, there would always be somebody who came around to find out what the problem was.

Sherkow: Did they always go together, all four of them?

Dresselhaus: Not always together. But they always went in groups of a few. Nobody ever went anyplace alone. The smallest number that would go together would be two. That summer in Israel had a profound impact on our family, as a family. What happened that summer was that the kids took music lessons in Israel. The Israelis are different than the Americans, in that for us, we do a lot of cultural things for fun. When they do something, they do it for keeps, so to speak. If the Israeli kids study music, they study to become pros. Now, of course, some of them--most of them, I guess, in the end are just amateurs, like they would be here. Probably that's not any different from here. But the attitude of the place is that when they do their thing, they have to compete with the whole world and be better than everybody else. Here's this little country with a couple of million people, and they take on the United States and Europe and everybody else. They're ready to compete with anybody. So when they do music, they do music also at that level of excellence and first-class competition.

My kids were exposed to that sort of music after just fooling around with music here. They all took music lessons while we were in Israel.

They took their instruments along with them, and they took music lessons. We didn't make any effort to get any fancy teachers, or anything. We just picked up whoever was convenient or had been recommended by other people whom we knew when we got to Israel. These teachers turned out to be really far and above anything that we had in the States. They were really excellent. The teachers told us that we had kids with a great deal of talent and what we were doing with them in the States was ridiculous, that we should take them to music professors. They thought our kids should be studying with people at the conservatory. The teachers criticized the way they were studying, and complained that we were not giving their musical education adequate attention. The kids got really fired up about music that summer we were in Israel, and when we came back we got the children signed up with much higher-level teachers.

--[Interview interrupted]--

When we came back to the States, we changed all their music teachers and the kids have really been going gung-ho with their music lessons ever since. They're really serious about it now.

Sherkow: Had they taken music lessons in Japan and Brazil those two summers?

Dresselhaus: Brazil has no music; music in Brazil is sort of funny. Brazil has a few excellent musicians, but they are so, despite the system rather than because of the system. To study music in Brazil is a hassle. There's almost nobody who studies. The number of people that study formally is very small. The level of instruction is very poor. It's not generally available. There are no instruments available. There's no interest in it. There is music, however, but it's sort of native music in the people; it's not developed.

Sherkow: So your children didn't take music in Brazil and Japan?

Dresselhaus: Japan was another thing. In some ways, our kids weren't good enough to take music in Japan. In Japan, <u>everybody</u> studies music. The kids are extraordinarily good. Why we didn't get organized into taking music lessons--it's a little hard to say why it didn't happen. Some of the kids took some lessons there. It was a bit of a problem because in Japan, the children all study with the Suzuki Method, and our kids had never studied under that method, so finding teachers wasn't all that easy. But the kids took a few lessons there which they enjoyed very much. They got a lot of exposure to the level of Japanese music. For the teenagers, I'd say it's different; few of them continue with music as teenagers. Most of them drop out by the time they're teenagers. Music's not the thing to do because children have to study hard to get into the university. So they don't have time for such frivolities, like studying piano, or whatever. At the teenage level, music is not really too good. At the higher levels, the conservatories are excellent.

Sherkow: When you went to these foreign countries in the summer did you want to have some kind of planned activities for your children?

Dresselhaus: We sort of played it by ear. In some places, it was more convenient than in other places. Travel in Tokyo was a lot more difficult than travel in Israel. Part of the reason is that distances are pretty far in Tokyo. Tokyo is an enormous city. The Japanese think nothing of traveling for one and a half hours by train to go to work or to any place. It is not the common mores for children to be alone in any transportation.

It's the practice that kids are accompanied by a chaperoning adult. Japan is also the safest place in the world. It has nothing to do with a low crime rate, either. It's just their way of doing things; mothers are always home, and mothers take care of children. You don't see children going off to places by themselves very much.

Another inhibition in the beginning was getting around. This was a little bit of a problem because you can't read street signs when they are in Japanese. They also don't have many street signs. The station names in the subway are generally written in Japanese, so it's a little hard to know where you are. Some of the rail lines had some English transliteration at the stations. But there aren't very many foreigners in Japan. So there's no reason for them to use any language but Japanese. There was a little bit of an inhibition in the beginning for the kids to travel around. With time, they got so they could get around Tokyo very well by themselves. They went to the department stores. They went downtown. The Japanese thought I was very, very strange to allow my children to go by themselves on these trips. It was not an accepted activity for children.

Sherkow: You went in three consecutive summers, '71, '72, and '73. Did you have other offers those summers to go to different places?

Dresselhaus: I don't know. Maybe I did. I don't really remember. After that, we could have gone some more places in '74, '75 and so forth, but the year after '73 the kids figured that they'd been traveling a lot, and they wanted to spend one summer at home. So we were especially <u>not</u> looking for any activity for '74. It was planned that we would stay at home.

Now when '75 came around, and '76, at least some of our children got more interested in a trip abroad, but we didn't get one organized. We didn't have the right offers. You have to have the right offers, too. You have to have the right combination of circumstances to pull off one of these trips. But we may very well go off on another trip again.

Sherkow: You and your husband plan these in advance?

Dresselhaus: Oh, yes. You have to plan these in advance. It's planned for a number of months. Somebody asks you if you're available to come to do a certain thing, and if you're available, then you pursue it. You tell them what the conditions are under which you can come, and there are some negotiations.

Sherkow: How would you evaluate the three summers that you were there in terms of your research?

Dresselhaus: I don't know that any of them had a big impact. I guess they had some impact.

--BEGIN TAPE ONE, SIDE TWO--

Dresselhaus: The one that had the most impact in terms of research was the one to Japan. As a result of some of the conversations with some of the people in the various fields in which we work, we started moving in some other directions. One thing led to another, and I think that a lot of our program today in the graphite area stems from that visit to Japan. It evolved with time through that trip. It didn't happen immediately upon return, but some of the things that we were discussing in Japan were

pursued after we came back and developed into new research areas. So I'd say that this trip has a big scientific impact. Japan is a first-class science country so that the science was really good.

The trip to Israel could have turned out to be similar to that. They didn't have a whole lot of people in my own research field there, so that the amount of interaction was more limited. Israel is a place that does excellent science. The Technion is a first-class institution, but it doesn't have all the fields of research. Being a small country with just a few universities, there are certain areas that aren't as developed as other areas. I'm in a field in which they don't have a whole lot of activity. So the interactions weren't as specific as the ones in Japan.

Now the one in Brazil had a rather small interaction researchwise. That was more of a service trip and a "have fun" trip. This trip didn't really benefit my research program at all. There were few people down there doing forefront research.

Sometime, it would be nice to spend a year in Europe. We've never organized a trip like that. We've had some invitations, but we haven't been able to pull them off. We haven't been able to work out the details, but I think such interactions are possible for the future. Maybe that would be an interesting thing to do sometime.

Sherkow: This just seems to be somewhat rare to me, to be able to go to a number of different foreign countries every summer.

Dresselhaus: It's not exactly rare. The things that we do are international, so people know us from all countries.

Sherkow: When you say 'us,' do you mean MIT or you and your husband?

Dresselhaus: Yes. As individuals; they know us through our work. MIT, of course, they know also. But you don't get invited because of MIT. You get invited because of what you might be able to do for them. This is an international business. This is all I'm trying to say. It's not all that hard to get an invitation and have them pay your expenses and salary. We do the same thing. We invite people from abroad here to the Institute. The reciprocal must therefore happen, too.

Sherkow: What do you feel were the professional benefits of that summer in Israel?

Dresselhaus: I got to know a number of people working there. I guess it didn't have a profound professional effect. It didn't change my course of study. It was just an enjoyable summer. I finished some work while I was there. That's all. I don't think everything you do has to be super-profound.

Sherkow: I was just wondering if part of your motivation to going to Israel was the fact that your background is Jewish?

Dresselhaus: Yes, I suppose that's part of it. I did want to see Israel. That's right, but I could go there just as a tourist, also. That's another option. But going there with a job is a lot more interesting because you get into the swing of things, and you get to see how people live. You're living with them. We lived in sort of barracks-type settlement. "Shikun" was what they called it. We lived right in the university housing

along with other people who had similar jobs. Many things in Israel work like in a commune system. It wasn't a kibbutz, exactly, but everybody who lived in that settlement cooperated in family living. Our settlement was a group of houses on a hillside. That's what the place was like. Maybe there were thirty houses. Everybody there was associated with the Technion, but in different departments. Each family had a little hut, a very small house. Each family lived in their own little hut. Then they had a communal play area for the kids. It was very nice, because our kids met a lot of Israeli kids. The thing that was amazing was so many of the Israeli kids could speak English because they'd spent a year or two in the States. Our kids were completely and thoroughly at home in that settlement. They felt very much at home living there. If you go as a tourist, you don't get into that sort of thing. It was a lot more interesting going as a visiting professor.

Sherkow: Are you raising your children in the Jewish tradition?

Dresselhaus: Not especially. I do to some extent, but we're not very strict practitioners.

Sherkow: There's all different levels.

Dresselhaus: Yes. It's some level in there. I think as far as the religious part is concerned, the kids were very much at home there. On the average, the Israelis also don't raise their children in very religious tradition, so our kids fit in very well with their counterparts there. I don't think that our kids were particularly excited about studying Hebrew. That was what I thought might have been a fringe benefit, that going there might have interested them in Jewish history and tradition and language, and so forth. The trip had some influence, but what they mostly

got out of that trip was this interest in music. So you can't plan in what areas things will have an impact. That was the biggest impact of the summer--it was on the children; it wasn't really on the parents.

The trip to Japan was for the kids more in the way of sightseeing because I don't think they became Japanese in any way. They learned a whole lot about Japan because we were living right in a Japanese community. We were the only Westerners in that community. Of course, the Japanese are very polite and hospitable. But that trip was more of a professional benefit. Of course, the travel was also very interesting.

Sherkow: Do you hope that you and your husband will be able to plan some trip to Europe in the future with your children?

Dresselhaus: I'm sure we could go to Europe sometime in the future. It's just a matter of getting organized and doing it. I don't know how these things happen. They just all of a sudden happen. I'm sure we'll go sometime. We just haven't made any inquiries.

Sherkow: Do you sometimes get offers without soliciting?

Dresselhaus: Oh, yes. These offers all came without solicitation. I think that if you go to Europe, you solicit a little bit. Say you'd like to spend a year at this or that place and you inquire if they'll have you at a few places, and some of them will be happy to have you and offer you some expenses. If you go as a sabbatical--I never did any of this as a sabbatical, but if you go as a sabbatical, you can take part of your MIT salary with you. So it's not so expensive to go. But for all these trips the hosts paid my way fully. I made out very well financially. But that

wasn't the thing. I didn't go to any of these things for the money. I went because I wanted to go to those places.

Sherkow: You indicated in "Profiles in Persistance" that your main interest was your family. Is that still true? Has that always been true?

Dresselhaus: Yes. I think that's a fair statement.

Sherkow: It was kind of a guarded statement.

Dresselhaus: Look, I spend a lot of time doing my thing, but I'm really interested in my family. You know, if somebody's sick or somebody needs something, I'm there. But my work takes a lot of time just because of its nature.

Sherkow: But you indicated that your family was your main interest, not your career.

Dresselhaus: That's one way of stating it. I think I didn't say it that way. I sort of said it had top priority, but in terms of the time in a week that I put into it, I put more time into my job.

Sherkow: Could you describe for me what a typical day is like?

Dresselhaus: The very early morning hours are family time; it's getting ready myself, and getting the kids ready, getting everybody ready for their day. It's making breakfast and making lunches and seeing everybody has what they need for the day. That's the way the day starts off. Then everybody goes to school and is out of the house by about a quarter to eight. So at that time there are no more kids at home. Then I get ready,

and I come down to MIT and I'm here at the Institute by eight-thirtyish. Then I stay here until five something, depending on what's on the agenda. Then I go back home. While I'm here, I'm thinking about my work. Then when I go home, my first few hours are spent with the kids, with their things, dinner, and what are their problems, listening to what they have to say. Then we all settle down and do our homework. Everybody settles down and does their respective homework chores. So I'm back doing lab work, but the doors aren't closed, and there's a lot of interchange between people; I'm there. Then during that period, we also get ready for the next day. So that's family time.

Then weekends are also family time. There's a lot of time that's spent in a typical day taking kids to music lessons. Every child in the family plays two instruments, and they're in innumerable orchestras, chamber groups, and everything else. Although they go to their own piano lessons, carrying cellos around you need to have cars, so there's a lot of transportation demand.

Sherkow: Is that once you get home?

Dresselhaus: Yes. We don't have lessons everyday. But most days we have some lessons requiring some transportation, somewhere. Often the transportation is quite distant so you stay with them until they come back. On Saturdays and Sundays we're just <u>completely</u> busy with the kids, with their activities. It starts around eight o'clock. So from eight o'clock on Saturday morning until six or seven on Sunday evening, it's one thing after another. You think that my day here is hectic. You should see my

weekends. My weekends sometimes make my days at MIT seem like child's play.

Sherkow: Do both you and your husband take your children to these various lessons?

Dresselhaus: It's not only the lessons, but whatever else has to be done. Yes, we pretty much share all that. There's so much to be done that it's not possible for one person to do it all. We have four kids in the Greater Boston Youth Orchestras; we have one at the New England Conservatory Orchestra; we have three in the Young Artist Program at Boston University. They get invited to play in all sorts of chamber groups and concerts. And there's rehearsals for all those things. It's very hard to explain quantitatively. It's different every weekend. But it's a whole series. We have one calendar at home that's as big as my book here. This system helps me to keep dates that just are commitments of the children. We have no other way to keep their commitments straight except from the calendar.

Sherkow: Is music your children's main interest?

Dresselhaus: At the moment, perhaps. It comes and goes. When they were younger, they were into hockey a lot. This is the first year that they're not on hockey teams. With regard to their sports activities, they take care of themselves.

Sherkow: You indicated in the Cosmopolitan article that there was no option for a woman but to succeeed. Could you comment on that?

Dresselhaus: Yes. I think that if you go into one of these fields where there are very few of you, you either have to do it in a big way, or you have no business being there. That's my feeling. If you're serious, I think there isn't much discrimination. You do your thing, and if you do your thing well, you get respect from your colleagues. But if you don't live up to the standard of what's expected in the profession, nobody will take you seriously, and then you'll have all kinds of problems, and one problem leads to another. Men are a little uncomfortable with women, anyway, in these rare professions when there aren't many women. It helps the men, too, in viewing you and in feeling how they should deal with you, to know that you're competent.

Sherkow: Isn't one of the problems, to use a trite expression, just "getting your foot in the door?"

Dresselhaus: Yes. Well, I think that's part of it. That's a good way of saying it.

Sherkow: Not so much that people fall down in their area of competence. Maybe some people don't get the chance to get into the entry level positions.

Dresselhaus: That's right. To get into the entry level position, you have to have a certain level of competence and a little bit of luck. But once you "get your foot in the door," you have to have competence to keep it in the door because if you "flub" it up you may not get another chance. I think that's what I was talking about, because there's a certain amount of distrust in women. It isn't that people especially try to distrust women in technical fields; it's just that they're not used to them.

They'd just as soon overlook you. If you don't assert yourself and demonstrate competence, they'll think you have problems. I think a good education is very important, also. I've emphasized that a lot. A good education helps with the competence angle.

Sherkow: It does sound to me like a woman has to stand out.

Dresselhaus: Well, not necessarily. You have to be as good as the average, or a little better. But if you're marginal, you're in trouble. I agree with that. But I don't think you have to be superlative. Maybe we've come to a good place to stop.

Sherkow: Okay, we'll stop for today, then.

END OF SESSION

MIT ORAL HISTORY PROJECT

Project on Women as Scientists and Engineers

Interview with Mildred Dresselhaus by Shirlee Sherkow

Cambridge, Massachusetts September 30, 1976

Session 9 transcribed by Janet Billane

Sherkow: I wanted to ask you some general questions that relate to women's issues. We touched on them earlier in your own biography, but not all of them. The first one has to do with female role models. What do you feel about the need for female role models for women in science and engineering?

Dresselhaus: That's a difficult and confusing question. I'd say that there are many people around who seem to flourish well without any role models. In the old times when there were very few women in the field, there just weren't very many role models. There were some. Everybody has some role models around, but I think that you made it because of determination and interest. It just worked out that way. Today, with more people thinking about science and engineering, I hear more noises about the importance of role models. In speaking with students and other people, I see that role models fulfill a very important need. If you offer the possibility of having role models around or not having them,

it seems that having them makes things an awful lot easier for most people. However, you can ask the question another way. Are role models necessary? When you ask that question, I come out with a different answer, that I'm not sure if they're necessary.

Sherkow: Were they important to you while you were growing up?

Dresselhaus: I've had various kinds of role models at various times. As we went through my biography when I was young, I never had the idea that there were things that were men's work and women's work, and things that women couldn't do. That was helpful. Later on, when I got into the science and engineering field, I did see women around, and I wasn't very sensitive to the fact that many had secondary positions. To me, they seemed just as important as the so-called primary positions. I wasn't able to distinguish between one kind of position and another. How much influence they had on my own career is a little hard to say because I wasn't--especially for many of the earlier years--that seriously committed to my career in the sense that it had my highest priority.

Sherkow: At what point did your career have your highest priority?

Dresselhaus: I don't know that it has my highest priority now. I think that my career has become so much more complex in the last few years that it's taken much more time and energy. There are many days that I don't finish what is minimally required of me. There are many such days. Even though I like to think I'm pretty efficient, it's just that so much is expected. I think that more is expected as you advance in your position. There's just more to do in the day.

Sherkow: That was my next question: if you could precisely state what are the main responsibilities of your job now at MIT as a professor in the electrical engineering department.

Dresselhaus: What are the main responsibilities? You've been around my office enough to know that there's always somebody here. There are multiple people, usually. There's usually somebody here and somebody on the phone simultaneously. You try to take care of the needs of the various people as quickly as you can. It's a hard thing to do. There's a few obvious things that are required. There's a teaching function. You teach a course, and the contact hours are what is most visible. There's no time for preparation of any course materials during the fifty or so hours I'm at the Institute. It's a very rare occasion that I'm able to put in any time at all on teaching functions, except for the direct student contact while I'm on the lot.

Sherkow: How many courses are you teaching this semester?

Dresselhaus: I teach between one and two courses each semester, depending on which semester it is and what I am teaching. All preparation for classes or essentially all preparation has to be done at home. At home is where you work seriously. You can't work on your own things while at the Institute, although you're here all day. You can't work on your own stuff because there are just too many other responsibilities. So okay, that's teaching.

I think the report I give here is typical of almost everybody in science and engineering around here. Now with the research function, there's

two kinds of research functions. There's the function that you do with students. Most senior faculty people have five, six, or some number of research students of that magnitude. They're mostly in to see you every day for something, sometimes several times a day. There's some interaction taking variable amounts of time. Some days you spend just a little bit of time with each student, and some days a given student will take most of the day. That's a variable thing. It's hard to say what happens on a particular day, you can only describe an average day.

Sherkow: Are you advising these graduate students on their research projects?

Dresselhaus: Advising may not be quite the right thing to say. We work on problems together, and when they're stuck or needing help or they have some results that are new and they want to talk to somebody about them, then they're here. When they're in the laboratory making their own measurements they usually consult other students. It is difficult to do research in the laboratory, yourself, with that many students. Maybe some people can, but-- --[Interview interrupted]--

Then there's research that has more personal involvement with colleagues, or where it is the faculty members who are doing the actual work. That, of course, has to be done at a time when the office isn't so busy. That's pretty hard to do around here during the academic year. That's good to do in the summertime. The summertime has a different pace, as you remember. Starting September first, things get very busy here. --[Interview interrupted]--

Sherkow: For your own research, what are you doing right now?

Dresselhaus: A lot of the research that I do gets started by students. They do some amount of the work. Either when they're still here I start working on some aspect of it, either with them or without them, or they leave and I continue some of the work on their problems. I'm now working on about four or five things that I started to work on with students at some time or another. Deborah's problems--she is the girl who just walked into the office--for example, are in the general area of graphite intercalation compounds. There are some aspects of her problem I work on, and some aspects that she's into. I, of course, have some projects that I take over after the initial involvement with the student. The part that I take over branches off into other directions from the original work. One project that I'm working on now is in graphite intercalation compounds and is in conjunction with some people at the University of Pennsylvania. We don't really work on exactly the same kinds of problems, but we do work in an interaction-type mode. We're just finishing a paper. This particular paper is not a real big thing. But I do get ideas from their work, and they get ideas from our work. On some of this, I work without students, and other projects involve students. There are some things that are amenable to student interaction, and there are other things that are less amenable. So faculty members have some of their own research going on at the same time in more or less all the fields that we have graduate students working in. Depending on how much energy and time we can devote to it, the progress on a given project will be slow or fast.

But because of our numerous responsibilities here, it is sometimes hard to devote as much to personal research as would be desirable. A lot

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of the responsibilities we have, I sometimes think are silly. If we had a better administration system, with less administration, things might be better. I think a lot of the administrative load comes about because we have so many administrators that have to keep track of things. We have to fill out forms to satisfy their needs. You'd be surprised at how much time goes into filling out these forms to help them keep track of things. I question how much the Administration helps me. There's often nobody else to fill out the forms, so I get stuck with doing that when I could be spending that time doing productive things. An unbelievable fraction of my time goes into these kinds of non-productive things that are required to keep the group going. If you sit here long enough, you'll see how much time goes into non-productive work, filling out forms.

Sherkow: When do you find time to work on your own research?

Dresselhaus: That's only in between times. It's between telephone calls and between people interrupting me all day. I try to get people out of the office on time according to their appointments and not have them stay over-time, because that time is my own work time.

Sherkow: Do you work at home, also?

Dresselhaus: Certainly. I work at home a lot, but all lectures also have to be prepared at home. All students' work has to be corrected at home. I have to take care of my own personal things at home, also. There may be three or four hours of work time each night, but that's all there is. I can't really do all the things that I'd like to do in that short period of time. It would be nice if I could spend more time away

from the Institute working on Institute things. A lot of the stuff I have to do while at the Institute is semi-productive. But it's important to students that I am available on a daily basis, because they need to have their questions answered, and they need to know where their research is going. You can't say that all the work done at MIT is unnecessary. But most of the stuff taking my time at MIT is stuff that I say doesn't matter tomorrow.

Sherkow: Do you feel that you have enough time with your children?

Dresselhaus: I wish I could have more time with them, but that's part of [life]. I do what I can for everybody. Nobody gets enough of my time. The students don't get enough of my time, and the family doesn't get enough, either. And I don't get enough time with myself, either. (Laughter) There just isn't enough time in the week to carry out all the things that I am supposed to carry out.

Sherkow: But I can't see you as just a housewife. It seems to me that your career is important to you.

Dresselhaus: Yes. I've said that it is important; I agree with that. But I like being home, and I like relaxing and enjoying the kids. My home life is very hectic, too, because the kids are into so many million things. It's not like I just sit down at home. I don't know whether I'm moving faster when I'm here at the Institute or when I'm home.

Sherkow: Do you have enough time to just relax? You have vacations, too.

Dresselhaus: Most of my best relaxing time is on airplanes. Vacations are sort of funny. Vacations with the family are relaxing. All other vacations are work vacations. The amount of time that I can devote to family vacations is pretty limited.

Sherkow: Didn't you go to Rome this summer?

Dresselhaus: Yes.

Sherkow: Was that a work-related trip?

Dresselhaus: Yes. That was a work-related trip. You do a wee bit of fooling around when you go on a trip like that, but it's almost all very concentrated work. Still, you spend less time sightseeing than you would be spending time with your family when you're home. There are so many people at a conference like that. There are so many people to see and talk to that there isn't a whole lot of time for sightseeing. We did spend a little time sightseeing. We saw the Colosseum. We'll go to one or two places. But the rest of the time, it's really pretty serious, doing science. But I do enjoy everything.

Sherkow: Right. So your children came with you?

Dresselhaus: No, no. That was too quick a trip. That was a one-week trip. That's too much hassle with children.

Sherkow: Was it just you and your husband?

Dresselhaus: Yes.

Sherkow: Did you have somebody babysitting the children?

Dresselhaus: Yes.

Sherkow: You've made a number of different speeches concerning women's issues, concerning women in science and engineering, and various other topics. We've discussed them somewhat in past interviews. How would you evaluate these speeches? Have you felt that you've raised the consciousness of some of your audiences?

Dresselhaus: Oh, yes. Those are easy speeches to give in terms of impact; yes, you certainly raise the consciousness of people. But it doesn't take a whole lot of my time because I know what I want to get across to the audience. You just get up and you say it. Yes, there's a lot of consciousness-raising because oftentimes you address an audience that hasn't thought about these issues. To you, they're pretty obvious, but if you haven't thought about them, they're not so obvious.

Sherkow: When, why and how did you get involved in the Women's Rights Movement?

Dresselhaus: Oh, I'm not in the Women's Rights Movement, actually. Not per se. I just do what's needed around the Institute. My women's activities are job-related. I'm not working on a general national level. I'm not a member of NOW.

Sherkow: I wasn't thinking necessarily that you had to be a member of NOW [National Organization of Women] but just the work that you've done.

Dresselhaus: There was a need for my kind of work. I think that I respond to needs for things to be done on behalf of women, and I just get in there and do them. I consider it part of my job while I am here at MIT to speak

up for women employees at the Institute. Maybe it's only thirty percent of the staff here that is female but it's not very far from half. Certainly there isn't a whole lot of women's representation at the upper echelons. Many of the people who make decisions don't really think of the impact of these decisions on the women employees. Women are often a big body of unheard people, so I consider it part of my job to speak up. If I have something to say, which I have had on occasion, then I get up and say it, but I'm not carrying their banner all the time. Most of the time I'm doing my technical work. I spend a very small amount of my time and energy on women's issues per se.

Sherkow: Maybe you were more involved a couple of years ago with the Women's Forum and Faculty Luncheons. You helped found these things.

Dresselhaus: I'm still heavily involved with the Faculty Luncheon. I was doing that today. Which reminds me, I have to fill out this form now. If you want to get a room over at the Student Center, you have to answer twenty-five questions. I haven't gone to the Forum for a long time. I just don't have time for that any more. That's an hour during the work week, and it's an hour of my time that I just find hard to spare. It's very hard for me to find an hour on Monday, so that doesn't get done any more.

Sherkow: In your opinion, what Affirmative Action efforts have and have not beem made at MIT?

Dresselhaus: That, again, is a hard question. I think that the Administration at MIT is on the side of women. I've always felt that. If we have

a legitimate complaint to make on the part of women, and we can show in what way there is reason for change, there has never been a problem about producing the required change. That has never been a problem. If there are things that haven't happened, it's because we haven't identified what the needs were or the women themselves haven't been collectively sure that this was a need for change or haven't had an idea for the solution to the problem. That is, you can't got to an administration any place--including MIT--and say, "Things are lousy here. Go change them." You have to say exactly what things are lousy, why they're lousy, and how they should be changed. When I have had a definite proposal that makes sense, including the implementation, I have never had an opposition. Now there are times when we come up to the Administration with proposals and they haven't been accepted, but I think in every case it was because we didn't have our case well-presented. I haven't felt that the Administration was unwilling to listen. I think that we just didn't do a good enough job in preparing our case.

Sherkow: What did that happen in? What incidences?

Dresselhaus: There have been a number of examples. When you first start presenting things to other people about social-type issues and you are not very experienced and don't know what the procedures are, then you don't have a good feeling for what all the questions are. You don't have a very realistic point of view. When we first started with this Ad Hoc Women's Committee and we had a number of sessions with the President of MIT and various people in high positions, the first few sessions were

pretty dismal. They were dismal because we weren't prepared. We didn't know how you present a program to the president of a large organization. We hadn't the experience, so we didn't do a good job. Consequently, our solution to the problem wasn't well-presented, and it wasn't adopted. But I think it was also because we had a lousy solution, and as our solutions became better and we learned how to present our case, the same group to the same administration, our proposal was adopted. It wasn't a question of hostility. It was just that we weren't good at what we were inexperienced in.

Sherkow: Aren't there certain departments at MIT--I'm not necessarily thinking of the Electrical Engineering Department--where women are really under-represented? An example I can give you is the Math Department.

Dresselhaus: Yes. There are things like that. I don't understand them. We have asked questions about this. The Math Department makes claims--they have made statements about their standards and their needs. This is something that's very hard to argue on both sides, because it's nothing that can be measured very quantitatively. I think many of the women here question whether the Math Department has made a convincing case. It seems very hard to believe what they say, but I don't think that we've completely disproven them, either. So I think that's one of the open issues.

Sherkow: As I understand it, in terms of the Math Department, there are no women on the faculty.

Dresselhaus: They have had visiting women faculty now and then. I don't understand why it is that they have not recognized any women as being of suitable caliber to serve on the faculty. I'm very perplexed about this, but it hasn't been proven conclusively one way or the other. I don't think that the antagonists to the department have proved that there is a cadre with specific names of women who are needed at MIT. It hasn't been proven that there are women who'd make an important contribution technically that have not been considered for a faculty position.

Sherkow: You think they have been considered.

Dresselhaus: I don't know. I'm not a m hematician. I'm telling you that I find it very hard to believe that there are no women who could contribute to mathematics at MIT. I find that personally very difficult to believe.

Sherkow: Wasn't Vera Pless in the Math Department?

Dresselhaus: No. She was in Electrical Engineering. She's now in the Math Department at Chicago Circle, but the MIT Math Department didn't see it as appropriate to make her an appointment here. So she got an appointment somewhere else. It's been very hard on her personally.

Sherkow: Yes, because she commutes. Her husband lives here.

Dresselhaus: Right. It's been very hard on the family, but that's the decision that they made. I can't prove how she ranks with other people whom they've hired recently. These are things that are very hard to prove.

Sherkow: It gets to be subjective.

Dresselhaus: That's what I'm saying. It gets to be very subjective. I think what's clear is the department hasn't made a real commitment to hire a woman in some field. I think that's clear, because I think there must be some woman in some field that can make a contribution that's worthwhile in mathematics and then will do a lot of other things because there are women students in the department who need some mothering. I see them here in this office. On the other hand, I'm not involved in their politics. For individual professors here, we just don't have time to worry about the politics in other departments. We're trying very hard to do our own jobs, and we get involved just where it's absolutely necessary.

Sherkow: As I understand it, Vera Kistiakowsky has been very involved in the employment end of women's issues.

Dresselhaus: Yes. She has been a lot more involved in this than I. I think she has more facts and figures than anyone. Mathematician women whom I know on the outside feel that there are women comparable to many--I don't know many--but some of our math faculty who are right here now. But that's a hard thing to prove, and the people whom they hire now are probably better than the average of what we already have because it's hard to get a job now. There are so many issues that it's very hard to be quantitative about it.

Sherkow: Did you personally ever experience differences in salaries with coworkers who were men or women?

Dresselhaus: Nothing that I'm aware of. The only discrimination that I think you get is from the federal income tax. At least in the early years when I was working, it wasn't economical for me to even go out the front door because after you deduct the expenses for babysitters and income tax and everything else, you'd be better off financially staying at home. But that isn't job discrimination. That's just the system as we have it. Babysitting is not a business expense, whereas entertainment is.

Sherkow: How do you personally feel about the Women's Movement in general, and the issues that they're generating and discussing and the progress or lack of progress they're making?

Dresselhaus: I think that most of the issues are very important, and I'm sympathetic with most of them. I think sometimes we overextend ourselves on issues. But then I think women don't agree on what the issues are. There's no real unanimity of opinion about the relative importance of issues. I think I come out somewhere in favor of the Women's Movement, rather than against it. But I'm mostly in favor or working with all people and not against men. Sometimes when the Women's Movement comes out against men, I wonder if it isn't counterproductive.

Sherkow: Do they come out against men?

Dresselhaus: There are some aspects of the Movement that are against everything that men do. There's a whole spectrum of opinions, and some of them are too far out for me. Where they have programs for reform that are feasible, I support them. I think the Movement has had a very positive impact on young women, especially from teenage up.

Sherkow: In terms of women's rights and women's issues, how have your own ideas evolved over time?

Dresselhaus: When I was in college, of course, that was before we were into the Women's Rights Movement.

Sherkow: That was the fifties, right?

Dresselhaus: Yes. I graduated in '51. So it was just the postwar period, when the men were coming home from the war, and the women were going home and giving the jobs back to the men. That was the climate of opinion. Men were the breadwinners, and they were in charge of affairs. Even then, I pretty much had run my own life, in collaboration with everybody who came along. I have always considered myself an individual with my own ideas of what I want to do; I still do.

I think that there was a change in my thinking in the early '70s when I got into the Ad Hoc Committee. In fact, since coming to the Institute, I have become an advocate for the women students and women employees. As I have been explaining all along, I don't spend a great deal of my personal time during the week doing things on behalf of women, because my other responsibilities are my top priority. But the little time that I put into it has been quite effective. I think that it has had some impact. I am an advocate for women, generally, especially when I think that there's an issue that isn't being addressed. I'm an advocate because the administration is so largely male. There's almost nobody else to speak up for women, and I feel it's my responsibility to do so. I

consider it part of my job more than I consider it to be Women's Lib. I'm the most senior woman faculty member of the Institute, maybe not in age, but in some other ways. Women look to me to come out and defend them when things go wrong. Since coming to the Institute, I have considered my role as an advocate. I support issues where I think that change is needed.

Sherkow: As a teacher at the Institute, do you feel there's a real lack of self-confidence on the part of your women students?

Dresselhaus: Yes. I think that women students tend to have less self-confidence than men. I think that's where women faculty could be very helpful. I think quite a few of us professionals have developed confidence over the years. It's been not so easy. I think that when I was a youngster, I didn't have a whole lot of self-confidence. But you know, it builds up with time.

Sherkow: What kinds of things as a teacher have you done to try to counteract this problem?

Dresselhaus: I think it's mostly by illustration. You run your class as if you're just like all the other faculty members. I've always done that. I put more effort into teaching than the average faculty member. I don't overdo it. I have so much responsibility, I feel that there's only so much time I can put into classes and teaching and students, but I do take it very seriously, and I try to be as conscientious as I possibly can. I worry about my responsibilities. I worry about fulfilling them. I think this has impact on both female and male students. I think the important thing is to impress on all of them that we can do it, too.

Sherkow: I agree. --(Interview interrupted)--

What do you feel are the assets and capabilities of which you are most proud?

Dresselhaus: That's a hard one. I don't know about "most proud." That wouldn't be the way I would put it. I think what makes me more useful is that I'm pretty good at getting things done. So that's one area of impact. Another area is identifying things to work on. This is true about research and other things I do around the Institute. So it's both the identification of the problems and figuring out how to attack them and doing them, and getting them done. I work in that mode, and I enjoy working in that mode. I don't know what else can be said.

Sherkow: What do you feel are the most important accomplishments that you've done in your life so far?

Dresselhaus: You can answer that yourself. I'd say that it's my family. I think we've been moderately successful with our children. I think they're pretty unique; like all human beings are certainly unique and an area of success. Now when you get down to other things, material things that have been accomplished, it's probably various research I've been doing in the semimetal field. In certain areas of the semimetal field, I'm an authority. I know this field well. I continue to have good ideas in the semimetal field. Then there are other fields where I've made lesser contributions, fields that I drift in and out of. I guess that's something that you're remembered for afterwards, by some of the important contributions. Another area is students that I've trained; I've had, since

coming to the Institute, a succession of graduate students and students in courses. I think that in almost all cases, we have had a very good relation, a relation that lasted over many years. That's another way of measuring impact.

Sherkow: What are your personal goals for the future? In terms of your career.

Dresselhaus: I just like doing what I'm doing right now. I'm just trying to get better at it all the time. I'm not really looking forward to any change. I suppose that by that question you meant, do I want to be a department head or a college president or on a board of directors of something. My feelings on those things are that I can be any of those if I want to, but I'm not sure that it would be more exciting than what I'm doing right now. So I may for some time go do something, take a year off and do something quite different from what I'm doing now, like any of those kinds of things that I've mentioned. But I think that I just like doing what I'm doing now best.

Sherkow: Teaching and research.

Dresselhaus: Yes. You spend a day here, and I might complain that I'm not satisfied with how the day's been spent, and there are other aspects of this job that I'm very satisfied with. What I don't like is the paper work that doesn't matter tomorrow. I just wish the Institute had some way of eliminating it. The Institute has become much more complicated because of the increasing size of the administration and offices that demand input.

If we could just get rid of some of these offices then I could spend a larger fraction of my time here doing the part of my job that I like best. I like people coming in and bothering me. It's a challenge to me to be able to solve their problems for them when they walk in the door, never knowing what they're going to come up with. A consulting office is what a professor's job is like, in many ways.

Sherkow: Do you presently serve on any government committees?

Dresselhaus: Oh, I serve on too many.

Sherkow: What are they, and what are you doing?

Dresselhaus: Just so many things, I don't want to even answer that question because it reminds me of all the work that I don't have time to complete. You have my resume, and you have a list of many boards and other things I serve on.

Sherkow: But which ones are the government committees?

Dresselhaus: There's just a lot of them that are in that category.

Sherkow: The National Academy of Science Report Revewing Committee?

Dresselhaus: Well, that's one. That one involves reading Academy Reports, numerous ones during the year and evaluating them and giving my opinion on them. I'm on the committee too, which sets the policy for reviewing reports. I'm not chairman of the committee. That's somebody else. But serving on the committee is a responsibility that takes quite an amount of

time. It's a very interesting responsibility in many ways because it covers very broad areas of science; it's never a report in my own field of expertise that I look at. It's the interaction between different fields of science that has the main impact at government levels and also the interaction between science and public policy. Those are the kinds of the issues that you're asked to judge when reviewing a report. Now that's an interesting job, but I'm on a lot of other things [as well]. I don't really feel like talking about them today because I have a lot of unfinished business for each of the boards I serve on. I should be working on these things right now, but here we are, talking together. Do you have a short question now, because I think we've exceeded our time and I have to get back to the pressing matters of the day.

Sherkow: From your own experience, how do you feel we can reach girls in their earlier years in terms of interesting them in science and math . . . encouraging them to really go into these fields seriously as careers?

Dresselhaus: I suppose that changes are happening, but those changes aren't happening as fast as I think they might be happening. The bottleneck is at the earlier levels, largely. It's in the junior highs and the high schools where so many of the faculty members don't have the vision that women can do it too, so they have different prescriptions for girls and boys of equal talent. That's something that will take years to overcome. I think that's where the bottleneck [is], and it's in the early years of schooling. Now, of course, we have the same problem in the universities, but once a girl gets as far as the universities, at least she has some message. As more women do arrive at the universities, the amount of determination that's required to get through the system decreases

somewhat. Larger numbers makes them more like everyone else.

Sherkow: You indicated in Cosmopolitan that you felt that teachers should treat female students the same as everyone else.

Dresselhaus: Yes. I think that when instructors, male and female, can reach the point of treating all students equally and having the same level of confidence that women can do it too, then this will work to the advantage of women. Making a spectacle of the women, either plus or minus, draws a lot of attention to them and tends to make them feel uncomfortable. I think that one can sometimes unknowingly make a woman student uncomfortable, even by trying to be extra nice. Don't pay attention to the sex, and the instructor does the best that way.

Sherkow: At the AAAS meeting this year in Boston there were Women in Science sessions. Derek De Solla Price gave a speech, and he felt that the hard sciences were basically male enclaves that were set up by men, with the purpose of only enlisting men. I was wondering if you felt that might be one reason why there's so few women in the field of physics.

Dresselhuas: I really don't think so. I don't agree with his views, anyway. He has his own little pet theories. They didn't seem to me, as a practitioner in these fields, to correspond to what I've seen in practice. I don't think that men are out to get you or to exclude you. I've been around the Institute for some time. I feel pretty much that I'm treated like everybody else. I don't think men are hanging out behind the walls, trying to gun me down.

Sherkow: The was his particular viewpoint.

Dresselhaus: I think many men have made an effort to help me; they have even gone out of their way. I'd say that in more instances than not, men go out of their way to include me or try to include me, and to try to make me feel comfortable. There are some times when that isn't true, but I'm just talking about averages.

Sherkow: Maybe we should stop now.

--END OF SESSION--

MIT ORAL HISTORY PROGRAM

Project on Women as Scientists and Engineers

Interview with Mildred Dresselhaus by Shirlee Sherkow

Cambridge, Massachusetts October 15, 1976

Session 10 transcribed by Janet Billane

Sherkow: This is the last session with Mildred Dresselhaus at her MIT office. I wanted to discuss one page on your resume which indicated your being elected to different memberships in different national organizations and also your work on different committees. I thought we'd begin with the election to the membership in the National Academy of Engineering in 1974. If you could, describe what that signifies and the goals of this organization and possible work that might be involved.

Dresselhaus: The National Academy of Engineering is the national organization that honors people in the engineering discipline. I think they have five or six hundred living members all across the country, and some foreign associates. Being a member of the National Academy of Engineering starts out as an honor, but it winds up as a lot of work. For me, it's been mostly a lot of work, and many of the times that you've come in here and have found me either going to Washington or coming from Washington, more often than not, it's been associated with my duties in connection with the

National Academy of Engineering.

Shortly after I was elected I was given a few jobs by the Academy. One of these is being a member of the Report Review Committee of the National Academy of Science. The Report Review Committee is the report review committee of all the organizations of the National Research Council, which constitute the National Academy of Science, the National Academy of Engineering, and the Institute of Medicine. Those are the three organs. These three organs are responsible for issuing reports on various questions of scientific interest that have some bearing on national policy. All reports that come out of the National Research Council have to be approved by the Academy in some way. Some of them are approved routinely. They just get approved by some staff people because it's clear that they're just routine reports. There are other reports that have some sensitivity to them; perhaps twenty-five percent of the reports are in this category. I'm not really sure what the statistics [are], but a fair fraction of the reports get reviewed by bodies of members of the Academy and others.

Being a member of the Report Review Committee is an interesting experience--that's one of the most important and powerful committees of the National Research Council. About a half a year after I was elected to the National Academy of Engineering, I got this job of being a member of the Report Review Committee. The work associated with this committee involves very few meetings; one a year is about all that's required, and those meetings discuss policy. Where the work comes in is that I am sent a lot of things to review and they ask my opinion on a lot of other issues, so it's mostly telephone calls and reviewing many things.

I also do a lot of reviewing for professional journals in my

professional field. I'm a very active reviewer for a number of journals. Then I also review research proposals for the various agencies. In addition to this, I review reports for the Academy. I'd say I review approximately one or sometimes two reports a month. The reports average a hundred fifty, two hundred, or three hundred pages. That's a lot of material on which to comment in detail. Then the various reviews go back to the people who made the study for consideration. That's basically what the Report Review Committee does.

The next one on the list that's here is "member of the Executive Committee of the Assembly of Mathematical and Physical Sciences in the National Academy of Sciences." The Academy of Science and also every part of the NRC is divided up into assemblies. One of the assemblies is in Mathematical and Physical Sciences; another one is in biological and social sciences--ABASS, it's called--this one's called AMPS. These assemblies are disciplinary. Then there are commissions. The commissions go across disciplines, like the Commission on Human Resources. One goes across disciplines, and is interdisciplinary, and the other one, intra-disciplinary. That's basically the way the National Research Council is organized.

The Assembly of Mathematical Sciences comprises physics, chemistry, mathematics, and earth sciences. They have also a representative from the Assembly of Engineering. In addition to that, they have a few at-large members. I am one of the at-large members, and I represent applied physics. That's a very time-consuming job. That's the most time-consuming job I have for the National Research Council. There are four meetings a year, two days each, and the preparation for each of the meetings is very large

because those are the policy meetings where we approve the programs of the assembly. You have to be familiar with all the programs.

Now, in addition to that, you become a liaison representative to various committees in the assembly, and there might be something like fifty or sixty committees in all; each committee has a liaison representative who works with the committee in its relationship to the National Research Council. For example, one of the committees that's mine is the Solid State Sciences Committee, which has, as its charter, the health of the solid state community. That's solid state physics, solid state chemistry, material science and related disciplines. One of its objectives is to worry about the professional health of these disciplines, research directions and research opportunities within these disciplines, and to do studies for the government in connection with various considerations for funding big projects, and in connection with national needs, what research and development we're doing and what the other countries are doing. The Solid State Science Committee is the interface of the U.S. with all research going on in all the other countries in the world in materials research. That's one kind of committee I work with.

Another committee that I have been a liaison representative for is the U. S. National Committee on Optics. Every country in the world has its national committee, the Great Britain National Committee, and the French National Committee, and so forth. Each national committee sends a representative to the International Commission in that field. A number of fields--maybe twenty or thirty fields--have international groups of this sort, and there'll be one or two American representatives who do international planning. But there's a bigger group here in the States

that worries about the national program. I'm liaison for this national committee to the National Research Council, so I have to be familiar with all of their activities, their programs, and to make sure they don't do something that's not within the charter of the National Research Council. I have to inform these committees of what the practices and policies of the National Research Council are, and so forth. I also work with them on their program, as requested.

Another one that I'm liaison member for is the U. S. Army Research Board. The Army has a Research Advisory Board, and I'm the liaison representative for that. So each of these groups will make studies on different things. I have to work with the people on the committee to develop proposals to make the studies and then after the studies are made to work with them on the report that comes out. Being a member of the AMPS Committee requires familiarity with the total program of the Assembly. But the detailed work comes with working with these different committees where the Assembly's work is done. All such jobs in the Assembly are divided up among the members. There are approximately eighteen or twenty members of the Executive Committee, and we all have assignments. It's very easy to spend the equivalent of one day a week doing that job. Now, of course, everybody that's on that is already very, very busy, and we all do it as an overload, so it's not that I really spend a day doing it. It's not a physical day that is one out of my five weekdays, but I work it in with all my other things. It does, however, involve a considerable amount of traveling. When you're in my office, you hear the telephone ringing a lot, and many of these are long-distance calls. A fair fraction of them have to do with this job on AMPS.

Sherkow: How do you feel about working on these committees when you're so busy?

Dresselhaus: The busy part I don't like. I feel it's a national service. Somebody has to do work like that, and you have to serve on a couple of them at once in order to know enough to be effective. It's interesting. It's scientifically interesting, because it exposes me to a very broad spectrum of things. My research is in a rather specialized field even though I'm pretty broad compared to a lot of other people. I don't work in one area at a time. I work in a number of topics, but I'm rather confined to a certain field. But these activities make me acquainted with many national issues, and make me become familiar with certain aspects of astronomy, earth science and atmospheric physics. I'm always reviewing things. It's like being forced to read the Scientific American all the time and being critical about it. You can't quite read it like bedtime reading because you have to come up with some sensible remarks.

I think one of the things that's a real plus--and maybe the biggest plus--is the people that you come in contact [with] being on these various committees and commissions. They're really a collection of outstanding people as people--very, very interesting people. I wouldn't have a chance to meet a lot of these people except through this kind of job. We have a lot of interesting people at MIT, and I know some of them. But this job brings me in contact with many stars, like the stars we have at MIT, at other universities around the country, as well as leaders of industrial organizations. So through this activity I've come to know the vice-presidents in charge of research in many of the important companies in the

United States. I really know many of them on a first-name basis. All that has happened through the Academy, because I've had to work with them on some project or another.

Sherkow: Is there good representation of women on these committees?

Dresselhaus: No. And that is the reason that I get asked to join these committees. I'm the only person I know who has two major assignments, like being on the Report Review Committee and the executive committee of an assembly. They're very hard-pressed to get women representatives doing anything like this. There are so few women academy members, and of them, they have to have certain qualifications before they are asked to serve. In fact, I was asked to serve on the Executive Committee of the Assembly of Engineering, also. This is between you and me. But I couldn't see being on two executive committees--one takes so much time already. I promised the Engineering Assembly that when my term of office on AMPS was over, they could reconsider me. I said I couldn't do justice to being on two executive committees at once. It is a lot of work and responsibility.

But they're just very hard-pressed to find women. I would not have this job if I weren't a woman, I believe, because I'm really quite young for serving on this executive committee. In age and accomplishment, I'm really quite young for being a member of this august body. When I look around at my colleagues on this committee, in terms of age and accomplishment, I probably do not belong there. This situation has put certain pressures on me to show I can do it too. It also took awhile to gain acceptance from the group. I think I have it now. I feel very much more comfortable serving on this committee than when I started. When I started,

it was very, very hard because these people who were on these committees with me had years of experience, and I was very new at everything. I had an awful lot of learning to do fast, but I'm a pretty fast learner. But I feel now that I can handle these things quite well.

Sherkow: A member of the Committee on the Education--

Dresselhaus: I wasn't finished. There was another thing that's not listed. See, my resume is always very incomplete. I don't manage to get everything down. The other big job I have in the Academy is a member of the Membership Committee of the National Academy of Engineering. That's quite a bit of work. I think I wouldn't be on the Membership Committee if I weren't a woman. But they wanted to have somebody to work on increasing the women's membership and to help identify qualified women for the Academy. I've been working on that. I do quite a lot of work for that. But because of that assignment, I'm also a member of the Membership Committee and a member of the General Engineering Peer Group. That isn't really such an interesting job. I'm more interested in the science part of service than I am in evaluating people. But because this is a time when women are coming into their own right, this is something I feel I have to do.

Sherkow: Is that a problem, getting more women?

Dresselhaus: Yes. It's a problem because there aren't very many in the field, and it's hard to identify them. But I think we've been quite successful. I really can't talk about this anymore because this is all privileged information. It's a job that the Academy takes very seriously. I've given it as much time as I can. I think our progress has been

satisfactory. The progress has been better than I had expected it would be. I have a lot of colleagues who really help. It's the men who help most. That surprised me. I have a group of men who are really interested and concerned. These are people in very high positions who are extremely busy and are giving Affirmative Action high priority and putting their time into it. That surprised me.

There's one other thing that's listed on my resume that is associated with the Academy: The National Research Council Committee on Education and Employment of Women in Science and Engineering of the Commission of Human Resources. As I explained, the commissions run orthogonal to the assemblies. This committee hasn't been very active, and hasn't taken much of my time. The committee has been a big disappointment to me. I think it's a committee that potentially could do a lot of good, but they don't have the right people on it and they don't have the right program. The only way to effect a change is to become chairman or a very active member of the committee, but I don't have time to do that right now.

Sherkow: That's too bad. I was expecting a real good response to that committee work.

Dresselhaus: Now the next thing that's on my resume is Fellow of the American Academy of Arts and Sciences. That's like the National Academy and the National Research Council. That's one for which it would be easy to do some work, because it's right here and centered in Boston. Their headquarters is Boston, whereas the other, the National Research Council, has its headquarters in Washington. However, I've laid very low on that one. I'm as extended as I can be in public service, and I've just not

volunteered to work for the American Academy. I didn't feel that I had to work on that one so much because there are a lot of women in social sciences and related areas. The American Academy of Arts and Sciences has people in all disciplines, including the fine arts. Therefore, the percentage of women is very much higher than in the Academies of Science and Engineering. This is how I've put my priorities. I don't do anything for the Academy of Arts and Sciences. I don't even have time to go to meetings, even though they are right here in Boston. But I am a member, and I pay my dues. I think it's a good organization. I think they're doing important things, but I just haven't had time for them right now.

American Physical Society: that's an organization I do a lot of work for. I've been for the last two years, chairman of their nominating committee, in which we nominate the officers of the society and the members to the various committees of the Society. It's a lot of work. Being chairman of it is about five times as much work as being a member. My term of office is finished at the end of this year. I'll just be an advisor to them next year. I've also been a member of the Buckley Prize Committee, which isn't a lot of work. But I get other assignments from the American Physical Society. It's a big society. There's thirty thousand members, so it's not a little thing. The office I had is an elective office. I was elected by the membership. Really, I must say that the society members seem to want women. I had the largest majority of any of the people running, the time I ran. I beat my opponent by many more votes than any other winner.

Sherkow: What does that involve, working on the nominating committee?

Dresselhaus: It's setting up the slates of candidates for all elective offices of the Society and all the committee members. There are many committees. It's a big operation, the American Physical Society. And I have a lot of responsibility. The job involves answering a lot of mail and reading a lot of stuff. But the job is nowhere in magnitude to what the Academy job is. But frankly, I think that having one job either in a professional society or in the Academy is about as much as one should do. I'm doing more things than I should do. Then I do other things, too. I'm on the Executive Committee of Evaluating the National Bureau of Standards, so I have to review all the reports of the Bureau of Standards on their various divisions. I have several jobs like that.

Sherkow: Vera Kistiakowsky indicated that she had been on this committee too, and she had been involved with this work.

Dresselhaus: She's very active in the American Physical Society, and she's been chairman of the Constitution Committee, revising the constitution. She's a member of the American Physical Society Council. She spends more time in the American Physical Society than I do. She has a bigger job than I do in the Society.

Sherkow: She had mentioned being involved in the nominating committee, and told me that it was difficult for somebody who wasn't well-known to get into the Society.

Dresselhaus: Yes. We had this idea of having self-nomination forms. I'm not sure if it was her idea or mine or whether we had it together. Let's say it was a mutual idea. It's not clear how it exactly hatched, but

it hatched between us. She wrote out the original solicitation for the self-nomination ballots, for people to nominate themselves for office, so that people on the nominating committee would know that they were interested in the office. I've been instrumental in having the committee make use of those ballots. Vera and I did that together.

Sherkow: Has that proved out to be useful?

Dresselhaus: Yes. We like the self-nomination forms. Another innovation was to have people make statements about what they'd do if elected to the society. That's worked out well, too. They don't all make the statements. We have it as a voluntary option because some people want to be elected just on the basis of their professional stature. That's the American Physical Society for you.

The next thing you see there is the IEEE. I don't do much for them. I'm a senior member. The most of what I do for the IEEE is being a member of the accreditation teams that go around to the different colleges and accredit different engineering departments. I do this service once a year. What it involves is spending about three days at some university and writing a long report which maybe takes another day. In this work I have to go through in depth the Electrical Engineering Department at this university and make recommendations as to all the ways that they meet the guidelines of the IEEE, the professional society. I also have to make suggestions on how they might improve their operation. That's basically what that job is.

Sherkow: Do you feel comfortable with being classified as an engineer?

Dresselhaus: Not exactly. The point is that with a little bit of work I could feel more comfortable. It's just the question of setting your priorities. There are certain fields of electrical engineering that I could and should know more about. If I took off some time to educate myself, I would feel more competent about engineering. However, it's a question of whether to do that or to do research, and my research program always seems to be doing well and is demanding of my time. There's only so much you can do in a day. Becoming familiar with certain aspects of electrical engineering that I would know if I had a degree in the Department of Electrical Engineering, I just haven't given that kind of study very high priority.

Now, I tell the IEEE when I do this accreditation that my background is really in solid state physics more than in EE; they know that. They send me out for service anyway. It's their choice. They're very anxious to have some women on these accreditation teams; they're really super-anxious. In many ways, I'm a pretty good accreditor. I can judge departments. I can judge programs.

But you've put your finger on a very important point, that there are gaps in my electrical engineering background that now I wish I had plugged. But this doesn't seem like a good time to plug them.

Sherkow: Because you're in the Electrical Engineering Department, you're usually classified in any written document as an electrical engineer, as opposed to a solid state physicist. I thought one of the reasons was because there are so few women engineers, and you're one of them.

Dresselhaus: That's right. That's basically how this all happens; you're right.

That's what you're called. In that Women and Success book, they person per discipline, and you're listed as an engineer.

aus: But that's alright, because the research areas that I work ppropriate for electrical engineers. They're also appropriate for :ate physicists. So there's no discrepancy between that title and contribution is. However, I wouldn't be a good person to teach basic core courses in the Electrical Engineering Department without e bit of work on my part.

v: It just seemed to me to be a little misleading. For instance, Oral History Program, before we looked up your whole background, we d that you had your degrees in engineering, whereas your degrees are sics.

elhaus: That's right. I have one engineering degree now. I have an ary Doctor of Engineering degree. That's really appropriate to eering, so I have some legitimate recognition. And I'm a senior er of the IEEE, which is also a recognition, because otherwise I would be a member. The deficiencies in this area are very easy to remedy, use the part about electrical engineering that I'm not familiar with uld learn very easily. Those are the easy parts of electrical neering to learn. I'm not about to worry about this. I'll let people ssify me how[ever] they want. I don't see that such a classification uld be a primary motivation for me to spend time learning special things.

Senior Member of Society of Women Engineers, I see, is the next m. I'm a member of that Society. They call me up now and then to this, do that. If it's short, something I can do on the phone or give

Sherkow: It's an evaluation process?

Dresselhaus: Yes. It's an evaluation process. This job also involves meeting in Washington occasionally. At these meetings all the different advisors get together and we compare notes. The second thing, the Materials Research Division, involves trips to Washington. On this board, they have advisors from all over the country. There's about twelve people altogether on this, spanning a very broad range of materials research interests. We try to give advice to this division of the NSF about research opportunities, and about the research program they support.

The next thing here says, "Solid State Sciences Advisory Panel and Committee." I used to be a member of that panel and committee, but I resigned from them when I became their steward. That panel and committee are part of the National Research Council. Now I'm their steward or liaison representative to the Assembly of Mathematical and Physical Sciences rather than being a member; I couldn't wear the two hats at once. I explained what that group does before.

The next thing that is listed over here is, "elected Director of Harvard Alumni Board." It says 1974. That means my term of office is finished in 1977. I have one more academic year on that Board. This is my last year in that job. What do I do in that job? The Board has three two-and-a-half day meetings a year. The meetings are close by here at Harvard, so no traveling is involved. That makes the whole thing possible for me to do. I'm not a very good attendee of meetings, but I do put one day into each meeting out of the two-and-a-half days. However, I have been moderately active on the committee. This board of directors works on the committee system. The Board has about ten or a dozen committees. I'm on

the committee called, "Undergraduate Relations." What I've been doing is to have a different idea every year for a project. I'm an ideas person for them, but not very good at it. I don't do very much work on the committee otherwise. I have generated a good fraction of the ideas of the things that the committee has worked on during the past two years. I'm pretty good also at figuring out how the committee might do the work. That's what I've done for this committee. It has been a really small job, the way I did it. However, serving on the Board is not a small job really, if you do it right. It's just that I didn't figure out very good programs to work on, partly because I am not very familiar with Harvard.

Sherkow: Is the board of directors an evaluation of the way things are going at the university?

Dresselhaus: Not really.

Sherkow: What is it exactly?

Dresselhaus: It's the liaison between the alumni, the university, and the students. It doesn't do too much evaluating. It tries to help augment the resources of the university. [That's] basically what the Board does. It has the statutory obligation for nominating the Overseers.

Sherkow: Now, are there any things that you left out on this?

Dresselhaus: I tried to put them in as we've been going along.

Sherkow: You've indicated a few as we've gone along.

Dresselhaus: Yes. There are areas of activity. There's the National Research

Council; that's an area, and there are a number of things that I do there, and I tried to explain these. Then there's the American Physical Society. That's another area of things. The NSF, that's the third area of things. Then there's Miscellaneous; Harvard is in the miscellaneous category. I don't take that job too seriously. I do as much as is warranted. When I ran for that office, I told them that I didn't have time. I also told them that I wouldn't be elected. They wanted a woman with some kind of science background to run for office, so they came and asked me if I would do it, and I said, "I don't mind running, because there's no chance that I can get elected. Nobody knows me at Harvard."

Sherkow: And you got elected.

Dresselhaus: I not only got elected, I got elected by a lot of votes. So I said, "Gee whiz, now I have this to do, too! How am I going to do it?" The way I've been doing it is to focus on ideas generation. Ideas are quick, and they have big impact for the time investment. So that's mainly what I've been doing for them. All in all, I do a lot of things, as you've noticed. Now you have a little bit better understanding why the telephone rings so much here.

Sherkow: We've covered a lot of different things, and it's taken a long time, but how do you feel, looking back, about how everything has turned out? How do you feel about the outcome of where you are now?

Dresselhaus: Of my career, you mean?

Sherkow: Yes. Where you are, and where you're going.

Dresselhaus: I'm at an age where I would consider myself in mid-career. I still think that I have a number of good research years ahead of me, and I'm active in that and excited about it. Active and excited. That's the way we have to be. This service that we talked about today, I'll continue to do that because I think that everybody has to serve if they can or are needed. There was a time when other people were doing this for me, and now I'm called on to do this work for the next generation. A lot of this work involves planning and policy-making for the country. It's sort of patriotism that drives one to do some of these things. Many of them are also professionally and personally rewarding. Some of them are just plain hard work. But we do them. I expect over the next decade or so I'll be involved in this kind of thing because I'm often asked to serve on things. Every day somebody calls me and asks me to serve on something or do something! My standard answer is, "no."

Sherkow: Do you think this will change when more women get into science and engineering?

Dresselhaus: Yes. I think it will change. You notice that the things that I pick to do are pretty high-level things. Most of them that I do are things where their choice in selecting people is very, very small--when there are only five or ten candidates nationally who would fit into a particular position, then I have to take the assignment very seriously. In other things, where there are <u>many</u> people that could do the job, I just say, "Find somebody else. I'm overloaded. I couldn't do a good job for you." I don't say I'm not interested, because I don't think that that's the right answer.

Sherkow: How do you feel in terms of your accomplishments?

Dresselhaus: In all dimensions, in everything that I've done, I've done orders of magnitude more than I ever thought I would do when I was a kid. Whether it's a career or family, everything's worked out very well for me. I'm one of these lucky people. What else can you say? I didn't expect to be a lucky person, but it just worked out like that for me. Maybe all the misfortune is still ahead.

Sherkow: Do you see yourself as being at MIT in an academic setting?

Dresselhaus: Oh gosh, yes. I get a lot of offers, because of today's opportunities for women in science and engineering. So there are a lot of people who talk to me about jobs, but the job I have here is really made to order for me. It's exactly the kind of job that I can do and enjoy doing. I just can't imagine anything else. You see, I've had an administrative job at one time. I know I can do administration if I have to, and a lot of these jobs that we were talking about today--these service things are in a sense running things, administration of science and technical administration. But to me, that's not a satisfying full-time job. That's an okay thing to do for awhile, but you get tired of it after awhile.

Sherkow: Yes. Some people think in terms of that kind of work when they are nearing retirement age.

Dresselhaus: Yes. I might do that--get into that sort of thing at a later stage in my career. I have lots of opportunity to do that sort of thing because I'm pretty good at it. But it doesn't satisfy me. Jobs of

vice-presidents of this, that, and the other thing, don't have the thrill of being a research worker. Maybe those jobs have more social prestige, but to me the daily job is not as interesting. Now there might come a time when making decisions will seem like the important thing, and maybe that's when I'll consider such jobs. But for the present, I only take on an assignment like that when I think that if I do it, it'll be done right, and it's very important to me that it be done right. In that kind of situation, I will take on an administrative job. But it's hard to imagine a job like that coming along.

BEGIN TAPE ONE, SIDE TWO

Sherkow: You were in the midst of talking about accepting an administrative position at some point.

Dresselhaus: I said I thought that was pretty remote for the next decade. But you can't rule it out. There might be the time and the place and the right opportunity. But I really like what I'm doing.

Sherkow: What do you feel are the most important discoveries that you've contributed in the solid state physics field?

Dresselhaus: I think some of the main things that I did were in a general way to show how magneto optics could be used to study energy bands in complicated systems, like semimetals, which are for coupled electronic systems. That's a general broad area where I think I've contributed in a major way.

More minor are the applications to the specific materials that I've studied. I think that in every case, we've made basic and important

discoveries in them, as for example, graphite and in the Group V semimetals. That's been a sustaining and long-term research area for me. I have branched out recently into graphite intercalation compounds, a field which I think we've mentioned in these interviews, and this is a field that I'm currently working in. I think that in this field our contributions will be very significant. They already have been important, but I think there's a lot more that's coming. This program is still at a building-up stage, rather than in an equilibrium stage. But that represents only one class of materials.

Sherkow: So you seem to be very pleased with the way things in the past have turned out?

Dresselhaus: I'm pleased because I've been happy doing what I've [done]. I have a lot of satisfaction day by day. I like what I'm doing, and when the problems are interesting and exciting, and I have an opportunity to be paid to do this kind of work, it is pretty fantastic. What's good about my job is I look forward each day to working, and I'm very disappointed when night comes and I can't work anymore. There are so many people in the world for whom a job means putting in time. To me, I wish the time would just be expanded and expanded, so that I could do more of the same. I think that's the difference between how my career evolved and other careers.

Sherkow: You mentioned that you just started working with your husband again. Is this something that you'll be continuing?

Dresselhaus: Oh, yes. Now that he's on campus, he's going to be around, and when he's around, we work together. We both like that. That's going

to be very nice for both of us. I think that my research career, opportunities and activities are going to be greater for the next decade. When I first came down to MIT, of course, I had to build up an activity. When you come to a new place, you always have to build up an activity, and that takes time and effort. In a job like this you have multiple demands on your time, so I couldn't do everything that I wanted to. It's a lot more efficient an operation with two people working together on a research project. It's a lot more efficient than each working individually, particularly if the work is complementary, so I can see that the next decade is going to have really good years for me in that regard.

Sherkow: Does he work with you on most of your research projects?

Dresselhaus: Yes. He works on a lot of things with me. I'd say most of them. We always talk to each other about everything. Research is something that has many facets to it. We both work on almost all problems to some extent. We talk to each other and get inspiration and ideas on many things. It's a sounding board kind of thing that I am speaking about. It isn't necessarily that when the research papers get written that both our names will appear.

Sherkow: Yes, I see. I've noticed in a lot of professional women, particularly in the sciences, that they're married to men that are also in the same field.

Dresselhaus: That happens, and it doesn't happen. It works both ways. I think that there's more opportunity to meet people in your own field, so maybe that's why it happens. Also, there's more a commonality of interest.

I'd say that it works out really well that way because I've enjoyed having somebody at home with whom I can discuss my work. I think I have a big edge over the other guys in the department that way. Maybe I have less time to work, because we have a family and other responsibilities, but we have other benefits in having somebody to talk to. When I do traveling in connection with all these different things I serve on, it's nice to have somebody who can take your lectures, and somebody that's really competent and up on everything. I know the graduate students like to give my lectures for me, and I've had them do that from time to time. In some cases it works out well. In other cases, it's an awful hassle. I know it's good for the students who give the lectures; it's not always good for the students that have to listen to the lectures.

Sherkow: Do you have time to be in community activities?

Dresselhaus: I don't do very much in the community anymore. I collect for the Heart Fund. I do all that sort of thing, neighborly things. I will also go down and give a pep talk at the high school to encourage students to apply to MIT. I get involved in some things, but it's pretty limited. You have got an inkling of what my schedule is like. I just can't do a lot more than I now do. But I think my community is important. I'd like to do more. Sorry, I have to go now.

Sherkow: Many wives and mothers get involved in PTA's and all types of things like that.

Dresselhaus: Oh, I don't get involved in PTA's. The excuse [is it] isn't

my job. The excuse there is that I'm not really a PTA person. (Laughter).

Sherkow: I guess we'll have to end right here. Thank you very much.

--END OF INTERVIEW--