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TRANSCRIPT OF A TAPE RECORDED INTERVIEW WITH

VERA KISTIAKOWSKY

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MIT ORAL HISTORY PROGRAM

Project on Women as Scientists and Engineers

Interview with Vera Kistiakowsky by Shirlee Sherkow

Cambridge, Massachusetts April 27, 1976

Session 1 Transcribed by R. Archibald-Woodward

Sherkow: I'd like to begin with your childhood. The first thing I wanted to know was where you grew up.

Kistiakowsky: I was born in Princeton, New Jersey, but my father received a position at Harvard when I was about two, so I grew up in Cambridge, Massachusetts.

Sherkow: Did you have any brothers or sisters?

Kistiakowsky: I have a half-brother, but he is not my father's son, and he is considerably younger than I am.

Sherkow: I wanted to know the level of education of your parents?

Kistiakowsky: My father had, I guess, what was an incomplete high school education in Russia, and then fought in the civil war on the losing side, and then had a graduate education at the University of Berlin where he got a Ph.D. in chemistry; it's an interrupted education ending at the Ph.D. level. My mother went through gymnasium and was in a school for physical therapists at the time that she came to the

States. I don't really know what degree level she was at, but it was post-secondary.

Sherkow: Could you talk about the occupations of your parents as you were growing up in Cambridge?

Kistiakowsky: My mother was a housewife, and my father was a professor of physical chemistry at Harvard University.

Sherkow: Were both of your parents born in Russia?

Kistiakowsky: No, my mother was born in Germany. My father was born, strictly speaking, not in Russia; he was born in the Ukraine.

Sherkow: But they decided to emigrate?

Kistiakowsky: Yes. My father came to this country on a fellowship--I forget what kind of a fellowship it was--and that was the position in which he was at Princeton. Then Harvard made him the offer and he got an immigration visa and eventually became a citizen. My mother came in on an immigration visa. But they had met in Berlin, where they were both students. So essentially she had come to join him.

Sherkow: But were your parents interested in becoming American citizens or did he just get this job offer? Did he have other job offers to choose from?

Kistiakowsky: No, I don't know whether he did or he didn't, but he definitely wanted to come to this country.

Sherkow: As you were growing up, what kind of encouragement did you receive from either your father and/or your mother in terms of any particular areas of study in school, not necessarily in science?

Kistiakowsky: I was encouraged to be anything that I wanted to be, basically, and this included doing well in school. I went to a private school in Cambridge first and then a private school in Boston, and at both places it was no disgrace to be a good student, quite the opposite. I got patted on the head for being a bright girl. So I got a great deal of encouragement.

Sherkow: But not any encouragement for any particular fields?

Kistiakowsky: No. I knew a number of chemists--I visited my father at his laboratory--but never any specific encouragement to be a scientist. Just praise when I did well, and support for other things that I wanted to do. Generally I got a great deal of support and reinforcement.

Sherkow: I was wondering if there was any special influence of having a rather "famous" father?

Kistiakowsky: He wasn't famous at the time. He became famous after the Second World War. He was known as an extremely good chemist, and he was a very hard-working person. I think the main influence was that he was enjoying a life which involved a great deal of work and activity in it, and in that sense he was an example for doing things that kept you very busy.

Sherkow: When I looked your name up in the scientific directories, of course your father's name was directly above yours, and I noticed that he had had a number of jobs in different places. I was wondering if you moved around a lot as a child?

Kistiakowsky: No, he was at Harvard until 1941 and then he left, because of the Second World War, to take charge of various government efforts, but he still was on leave from Harvard. He did not resign

from Harvard, they released him to go and do war work. As soon as the war was over and he was released from Los Alamos, he came back to Harvard. My parents were divorced in 1941 and I lived with my mother after that, so I did not see him very often. I visited him at Los Alamos for a couple of summers, but until that I didn't see very much of him.

Sherkow: You mentioned that you went to a private school. It was until the junior high level?

Kistiakowsky: No, I was first at Buckingham, a primary school in Cambridge and then at Brimmer May in Boston until my parents were divorced and my mother moved to Pittsburgh, where she remarried. I spent three years in a public high school there. I guess I skipped sixth grade and then, again, I skipped the tenth grade, so I was quite young when I was in high school. I also detested the high school.

Sherkow: Now which one are you referring to?

Kistiakowsky: The public high school.

Sherkow: Why did you dislike it?

Kistiakowsky: Well, it was very different from the private schools that I had been used to. [...interview interrupted...] The private schools had small classes and a great deal of attention to the students; the individual students were important. You were encouraged and you were praised. In particular, Brimmer May was a girls' school so that

girls were important as individuals--they were the people who were being taught. What I'm saying now, of course, comes with the benefit of hindsight. At the time I didn't think very clearly. All I knew was that I didn't like the atmosphere in the public high school.

Sherkow: Was it the first time you were with boys?

Kistiakowsky: That's right. And I was two years younger than the other people and I guess I was, also, not very socially advanced because of the rather restricted atmosphere I'd been in before. It came out, not in being unhappy, but just not liking it at all. So I put all my effort into getting through high school as quickly as possible and was able to skip one grade.

Sherkow: Why did your mother send you to the public school?

Kistiakowsky: Because there were no good private schools in the area. This was a very good public high school. It was Mount Lebanon High School and it was supposed to be one of the very good places to get an education. I had a few good teachers. I had an algebra teacher who essentially gave me the book and said just go and study on your own, and didn't hold me to the pace of the class. There were a few others who were reasonably sympathetic. I did well academically.

Sherkow: Was there a difference? You mentioned that at the private school it was nice being a girl in an all-girls school. But were there things that you noticed in the public school?

Kistiakowsky: The girls in the public school were, from my very limited point of view, only concentrating on attracting boys. I'm sure that I'm being extremely unfair to them. I was making a very

great over-generalization, but that was the point of view that I took. Also, I didn't think that very many of the students were very serious about their studies. At the time they gave a thing called a mental ability test; I had had scores of tests like this before, because in private school you get tests all the time and I did extremely well. The school was dumb enough to tell me that I was a genius compared to everybody else in the school. And it was just that the other people hadn't had that kind of test before. I'm sure I was't that much of a genius--I mean, I know I wasn't.

Sherkow: But they told you that when you were in the public high school?

Kistiakowsky: That's right, and it just fed a sense of being different.

Sherkow: Did you feel that the teachers paid more of an academic interest in the boys at the high school?

Kistiakowsky: Yes, in the physics course, in particular. First of all, I think I was one of two girls in the class and the teacher was essentially talking to a few of the boys who were good at it and were paying attention to him. Then there were all the rest of the boys and two girls.

Sherkow: So you felt rather left out?

Kistiakowsky: I felt left out, yes.

Sherkow: As a child growing up, what kind of activities were you involved in? I'm thinking non-academically, other than studying your school materials.

Kistiakowsky: When we lived in Cambridge I went skiing and hiking with my father, and I went horseback riding, which was a sport that my mother supported me in. She drove me out to the stable in Concord so that I could ride. Those really were the things that I enjoyed the most. I mean, I played the usual kinds of games at school. And I just read an awful lot--that's the other thing that I did.

Sherkow: How about friends?

Kistiakowsky: I usually had one or two close friends and was on reasonably good terms with the other people in my class at school, but never a large group of friends.

Sherkow: Did you feel or notice a lot of peer pressure from the students as you were growing up?

Kistiakowsky: The only time that I noticed it was in the public high-school--well, I don't know. That's unfair. I'm sure there was a lot in the private schools, too, but since it wasn't in a direction that bothered me, I probably didn't interpret it as peer pressure. I don't know what those schools would have been like if I had stayed there all the way through high school. It might have changed as people got older and got more interested in dating and dances and things like that. But, at the age where I was there it was still very...asexual, I guess, is the only way of describing it. The girls were really <u>people</u> more than they were girls. There were a few exceptions, but, by and large, that was the way they interacted.

Sherkow: But at this public high school you noticed or felt a particular kind of peer pressure towards what? If you could just elaborate on it.

Kistiakowsky: It wasn't so much that it was a pressure on me, but it was that the girls who were thought well of, wore nail polish and lipstick, dressed to please the boys, and concentrated their interests on pleasing the boys.

Sherkow: So there was a peer pressure on the part of the boys toward all girls, that this is what all girls should do?

Kistiakowsky: I don't know if it was the boys that were doing it to the girls or if it was the girls that were doing it to themselves.

Sherkow: Well, it had to come from somewhere. The parents, perhaps?

Kistiakowsky: I think it was the time. I'm sure that things are different in high school now. I think they're different in high schools now, just judging by the people who come to MIT.

Sherkow: I think there are peer pressures, but maybe towards other things.

Kistiakowsky: That's right.

Sherkow: How would you basically evaluate your home life? Warm, intellectual, mother-or father-oriented--these are just some possible choices.

Kistiakowsky: When I was a small child it was a very warm home life. The divorce and the years immediately preceeding the divorce were rather uncomfortable.

Sherkow: How old were you?

Kistiakowsky: It must have been the spring of 1941. That would make me not quite thirteen. Twelve and a half. I was born September 9, 1928.

Sherkow: So that period was particularly bad?

Kistiakowsky: Yes. I resented being separated from my father whom I admired a great deal. I was very fortunate in having an extremely nice man given to me for a stepfather, who was enormously patient and remains a very good friend to this day. He really truly put up with a rather cantankerous teenager. [Laughter]

Sherkow: So while you were growing up, you were an only child. Did you feel different?

Kistiakowsky: Well, my brother was born shortly thereafter.

Sherkow: Oh, when your mother remarried?

Kistiakowsky: Yes. So I did have a very much younger brother.

Sherkow: But there were thirteen years when you were living alone.

Kistiakowsky: Yes.

Sherkow: Did that make you feel different from other kids?

Kistiakowsky: No, it didn't make me feel different. But from all the studies that have been done, it's clear that growing up an only child gives you a feeling of importance, and I think that was true in my case.

Sherkow: I see. So you mentioned that until the divorce you would classify your home life as being warm. Then afterwards what would you say?

Kistiakowsky: Well, it was not my mother's fault. As I say, I resented being separated from my father. Feelings like that have a bad habit of being spilled out on the person who is closest to receive them, and

it happened to be my mother.

Sherkow: Did you see your father very often?

Kistiakowsky: No. I saw him very seldom, simply because he wasn't in Pittsburgh. Whenever he could come to visit, he would come, but it was maybe once or twice a year.

Sherkow: So, until you moved back here, you didn't see him that often?

Kistiakowsky: No, I went and spent the summer of my senior year in high school with him in Los Alamos. The following summer, after my freshman year in college, I again spent a summer with him in Los Alamos. So, I did, in fact, live with him for those two summers. Then, when he came back to Cambridge, I saw him occasionally. When finally we moved to the Boston area I saw a great deal more of him.

Sherkow: What were those summers like at Los Alamos?

Kistiakowsky: They were wild! They were fantastic! It just was completely different for me than it was for anybody else. First of all, I was doing something I wanted to do very much, which was to go and visit him. Second of all, I had a horse each summer, and I lived a completely undisciplined, uncombed, I suspect unwashed, [laughter] and very carefree existence there. I didn't know what was being done there; my father did not tell me, until it was publically released, what was going on. But it was clear that it was some kind of a very secret project. You know, I knew what field he was in.

Sherkow: Did you meet a lot of people that he was working with?

Kistiakowsky: Yes, he would point out that his gentleman was Niels Bohr and that gentleman was Enrico Fermi, and I should pay attention

because they were very famous physicists. But, I think I paid more attention to my horse. [Laughter]

Sherkow: Did you have your own horse?

Kistiakowsky: Yes. I guess from the point of view of an adult it was a very repressive atmosphere, because they had stockades and guards with guns. When I first came they had the cavalry unit, but they, shortly thereafter, disbanded it and sold the horses and replaced the cavalry with jeeps and things like that. So my first horse was one of the cavalry remounts.

Sherkow: Were there other children there to be friends with?

Kistiakowsky: There were some other children, but very few my own age. There were the twin daughters of the Nobel prizewinner [Sir James] Chadwick, the Englishman, who were there, I guess, the first summer I was there. But they were very civilized, ladylike, English girls, and after a couple of riding expeditions, the attempt to be friends sort of petered out very rapidly.

Sherkow: It sounds like you were basically on your own?

Kistiakowsky: Yes, I spent most of my time by myself, and I <u>really</u> enjoyed it. I did all kinds of things that I'm sure were taking unnecessary risks.

Sherkow: Such as?

Kistiakowsky: Well, I lost the first Chadwick girl as a friend because we went riding and it got late and I said, "Let's take a shortcut. Let's go up the side of the mesa rather than going around and up," which would

take us an extra hour. So we got off our horses and started to climb up the side of the mesa. Everything would have been all right, except one of the Chadwick daughters put her hand down and the horse stepped on it. [Laughter] It really wasn't funny. The poor girl was hurt, and I caught hell. I was two years younger than they were, but I still had no business getting them into something like that.

Sherkow: Did you still proceed to take the shortcut?

Kistiakowsky: Oh yes, we got up to the top of the mesa. She walked and I pulled two horses along. [...Interview interrupted...] Then a week later I went out riding with the other sister, and her horse ran away with her; again I got blamed. It really wasn't my fault that time; she was riding a horse she couldn't control, and it took off. Eventually the horse got tired and stopped running, and then I caught up with her. But somehow it was associated with me again.

Sherkow: But it sounds like they were not good riders.

Kistiakowsky: They might have been good park riders, but it was very rough country and these weren't very well-behaved park horses--these were cavalry remounts; I think that's what the problem was.

Sherkow: What did you do in your spare time? You've mentioned a few things, like reading and riding. Did you play a musical instrument?

Kistiakowsky: I tried to learn how to play the piano a few times and it really truly didn't work. I don't think that I have any real musical ability. It's hard for me to keep a tune unless it's a really very well-marked and an easy tune. Music just isn't something that comes easily to me.

Sherkow: What about sports?

Kistiakowsky: I've tried to learn how to play tennis and all I can say is that balls and I were not meant to do things together.

Sherkow: So you did a lot of reading and studying, and you rode horses and went skiing. I'm just talking about when you were growing up. Does that pretty much cover it?

Kistiakowsky: That's pretty much it.

Sherkow: Chronologically moving into the junior high-high school era, did you have any expectations that you would either be a career woman or a scientist? Did you have any expectations as a high schooler?

Kistiakowsky: Yes. When I was about eight or ten I had a conversation with my father in which he said quite explicitly that everybody should do something with their lives. It didn't necessarily have to be being a scientist. The example I remember was being a ballet dancer, which was certainly not something that applied to me. But in any case, one should have something that one could make a commitment to. I don't know whether this really was just a single conversation the way I remember it, but certainly this was something that was said very explicitly. So, I always intended to have a personal identity of some kind, either professional or artistic or something like that. When I was in high school I thought of going to medical school and becoming a doctor of medicine. That certainly was the intention with which I went to college.

Sherkow: I see. What were your parents' expectations along these same lines?

Kistiakowsky: I think my mother would have been very pleased if I had become

an MD. She never pushed any kind of a career commitment on me, but she clearly was pleased with the idea when I presented it. And, as I say, my father was certainly keeping his hands off pushing me in any particular direction except in the direction of making up my mind about what I wanted to do; he also thought this was a very reasonable choice.

Sherkow: It sounds like both your parents clearly wanted you to be involved in some kind of career, although they didn't push you in any particular one.

Kistiakowsky: That's right.

Sherkow: Fine. When and how did you develop an interest in--it's physics, right?

Kistiakowsky: Well, no. It started out really with chemistry. I had a chemistry set. I think many children have done that and that was fun. My father showed me some trick chemicals that you could put together, like very low burning-point fluids which were fun because you could set your clothes on fire and scare other peoples' mothers into fits.

Sherkow: When did you get your set?

Kistiakowsky: I was still in Cambridge, so I was younger than twelve--must have been about ten at the time. But it never was really terribly serious. It was not the great scientific genius in the making, by any stretch of the imagination. It was a kid piddling around with chemicals. Then, when I was in high school, I <u>might</u> have gone in the direction of chemistry or physics, but the courses were really so awful that they completely killed any feeling that this was interesting.

Sherkow: The courses were awful in chemistry and physics?

Kistiakowsky: Yes.

Sherkow: Now you're talking about the public high school?

Kistiakowsky: The public high school.

Sherkow: You were at the private high school for two years of your high school, right?

Kistiakowsky: No, no. I was in the private school through eighth grade and that was not the upper school in that school. That school had a different division, so I would have gone into the upper school in the tenth grade; instead, I went to the public high school and immediately decided the thing that I had to do was to get through the public high school as quickly as possible. I don't know whether officially I skipped the tenth grade or the eleventh grade, but I did, in fact, get out in three years.

Sherkow: Okay, so you were talking about the science courses at the public high school?

Kistiakowsky: Yes. There was no science at the private school. I think there would have been if I had stayed there, but I had not had any.

Sherkow: Okay. I'm talking about developing an interest in science.

Kistiakowsky: Yes. If you're presented with a page that has blanks in it and you're asked to do certain things and fill in the blanks, it doesn't make chemistry or physics look terribly interesting. It makes it look pretty revolting, as a matter of fact.

Sherkow: So that's what it was like?

Kistiakowsky: That's what it was like, and I think that's why I never developed an interest there; whereas medicine was something with which I was not yet acquainted except as a patient. Therefore, it was very easy to have a theoretical interest in it.

Sherkow: I know you were just trying to get through high school, but what kind of courses did you take?

Kistiakowsky: I took another year of Latin. I took some more French. I took all the mathematics they offered (which wasn't very much). I took chemistry and physics. I had to take American history and English. I basically just took all the required courses I needed to finish.

Sherkow: Did you read science or math books on your own? Did you do any studying on your own?

Kistiakowsky: I read some popular science on my own, but not hard science, not textbook-type material, no.

Sherkow: So in high school you decided to be premed in college?

Kistiakowsky: Yes.

Sherkow: Had you taken all the science that they offered?

Kistiakowsky: No, I never took biology, so I had a big gap in my education.

Sherkow: But you took all the math courses that they offered?

Kistiakowsky: Yes.

Sherkow: When you were in high school, were your teachers encouraging? You mentioned in physics class that the male teacher was not encouraging to the two females in the class, which you were one of.

Kistiakowsky: Yes. I think I was treated as being somewhat of an oddball. As I said, the one math teacher was just enormously decent. She let me just take the book and work at my own speed and when I had finished the book for the course, then I was allowed to go into the library and read during math period, which was a flexibility on the part of the teacher that all of them didn't show.

Sherkow: But an "oddball", what do you really mean by this? The teachers felt you were, what exactly? Strange in some way?

Kistiakowsky: Well, maybe not odd, but nonconforming. I didn't wear lipstick. I didn't wear nail polish. I didn't have friends, and I'm afraid I probably made it fairly obvious that all I wanted to do was to get out of high school as quickly as possible.

Sherkow: As a consequence of their feeling that you were different, didn't they like you or did they discriminate against you in any way?

Kistiakowsky: Not that I was aware. The only really bad interaction that I felt existed was in that physics class.

Sherkow: But they couldn't be called encouraging?

Kistiakowsky: Well, no, I think that math teacher was.

Sherkow: That particular math teacher, but the others were--?

Kistiakowsky: Noncommittal.

Sherkow: Okay. So in high school you really weren't interested in science, you were premed. Did you ever feel that that was an unusual thing to be? There must have been other people, though, that were premed in high school.

Kistiakowsky: I felt that I was unusual.

Sherkow: You did?

Kistiakowsky: Yes. I guess because of my background and because of heartily not wanting to be there. One way of making oneself feel good about such a situation is to feel that one is different from everybody else.

Sherkow: When you mention your background, what are you really referring to?

Kistiakowsky: I'm referring to coming from Cambridge, having a father who's a Harvard professor, going to private school and coming to a very big public school. I'm sure that that was a very well-to-do community and I was being incredibly intellectually snobbish in this point of view. But I really felt that most of the people in the high school were not interested in intellectual matters and certainly, in my opinion, as I said before, none of the girls were. Again, I'm sure that I'm doing them an enormous injustice. There were some four thousand students in the high school--it was as big as the MIT undergraduate class--and in the two thousand girls that were there, I'm sure there were others who were also interested in intellectual things.

Sherkow: Do you think that being at that school for just three years and not coming from that community might have affected your ability to have as many friends, as a lot of the other girls?

Kistiakowsky: I had no friends; I mean, literally.

Sherkow: Oh, you had no friends. I thought you said you had one or two close friends.

Kistiakowsky: All the time I was in private school. But those three years, I really was a complete loner.

Sherkow: Did you ever feel lonely?

Kistiakowsky: I'm sure I did, but I probably rationalized it somehow.

Sherkow: Probably repressed it.

Kistiakowsky: Yes. You know, if you can't have something, you convince yourself you don't want it. It was a very bad time.

Sherkow: It sounds like it was. Maybe you can get into this a little bit: it sounds like the whole atmosphere of this high school was that girls should look one way and act one way and boys act a different way. Did the high school in any way channel the girls by making them take certain courses that were female-oriented?

Kistiakowsky: There can't have been anything like required home ec, because I can't remember taking anything like that. The only required thing

was a health course that was sex-segregated, because they talked about VD and the dangers of pregnancy, [laughter] and they didn't do it to a mixed class in those days.

Sherkow: I was thinking more in terms of the situation I encountered at my public junior high school where we had to take home ec and the boys took shop.

Kistiakowsky: But you see, in the private schools I went to, the girls took shop.

Sherkow: Right. So there's the nice thing about a private school.

Kistiakowsky: Yes. There are some very bad things about a private school--like you end up thinking you're a member of some kind of elite.

Sherkow: Did you feel that way?

Kistiakowsky: Well, I wasn't conscious of feeling that way, but I think that might explain some of the problems that I had when I went to Pittsburgh. I mean, clearly the students in the two schools were very different, so that would have been a problem in itself. But I also was making a value judgment that the way things were done at the private school in Boston was the right way to do things, and the way they were done in the public school in Mount Lebanon, Pennsylvania was the wrong way to do things.

Sherkow: Did you feel that at the private schools the students were more serious about their studies?

Kistiakowsky: Yes. You know, that was the reason you were in school, to study. You also made friends, and you had a good time between classes; you went and played field hockey, and you did all kinds of

things. And there were birthday parties and other things, but the reason you went to school was to learn.

Sherkow: It must have been kind of a culture shock to go to this public school.

Kistiakowsky: Yes.

Sherkow: So your social life in high school was as a loner.

Kistiakowsky: Yes.

Sherkow: You didn't date boys, right?

Kistiakowsky: Right.

Sherkow: This would be kind of a summary, but in listening to you now it sounds like you had a high degree of self-confidence and you felt that you were bright.

Kistiakowsky: I was an obnoxious teenager. [Laughter]

Sherkow: Did you feel that way, too?

Kistiakowsky: No, no. That's a retrospective view of myself.

Sherkow: Trying to think back to what you felt then, what do you feel in your home environment or maybe your earlier educational experiences helped you in developing those feelings of competency?

Kistiakowsky: Simply because when I displayed competency, it was always rewarded by somebody at least saying, "That's a nice job," or praise of some kind. Even if it's just minor praise, it tells you that that is the right thing to do, it reinforces what you do.

Sherkow: Now that happened at the private schools?

Kistiakowsky: It happened at the private schools, and it certainly happened from my parents.

Sherkow: But at the public school level, it doesn't sound like it happened?

Kistiakowsky: There were very big classes. There were, I think, forty students in each class or more. Again, one's filter is very selective. At least mine is. I'm sure that the way I remember things is quite distorted, so I may be wrong and there may, in fact, have been more student-teacher interaction. But, with the exception of the two teachers I've mentioned, I have no memory of any teacher at that school, whereas I can remember teachers from the private schools, some of them quite well.

Sherkow: That sounds to me like there was more positive feedback at the private schools.

Kistiakowsky: Yes, I think there was.

Sherkow: But it also sounds to me that by the time you did go to public high school, you already had the confidence from your background, and it couldn't be lowered even though you, perhaps, weren't getting all the positive reinforcement that you'd received earlier.

Kistiakowsky: You see, I did the work very easily, and I got good grades. I did have a very good academic preparation and it's somewhat of a puzzle to me, because I don't think the private schools were that good academically. But maybe they were. Maybe they were better than I thought they were. Certainly the school in Boston, Brimmer May School,

is now not considered a good academic school. It's now out in Chestnut Hill, and it's considered a relatively undemanding school, academically speaking.

Sherkow: But after you got out of high school how did you feel about your education?

Kistiakowsky: I certainly had an easy time those three years in the public high school, and it may have been because I was used to working--I mean, this is something I had done all along--and maybe the other students weren't so used to working. I don't know. But I think there was a difference. Whether it was my attitude or my preparation, I'm not sure, but something.

Sherkow: It sounds to me like you're saying that the preparation which you had at the private school was really excellent for going into college.

Kistiakowsky: Yes. But I don't know if it was academic, again. It may just have been this business of taking yourself seriously and taking the business of studying seriously.

Sherkow: All right. From certain things that I have been reading, it seems to be somewhat important to have taken math courses if you wanted to become a scientist.

Kistiakowsky: Yes.

Sherkow: Not so much that you had to do well at them or that you had to be an A student in all the courses, but simply that you had to have

taken them. I was thinking along those lines of preparation for science, because when you get into college you just can't start new with everything. You have to have had at least three, or probably four years of math which were taught at a halfway-decent level. It sounds like you had that.

Kistiakowsky: Yes.

Sherkow: The public school was not quite what you had hoped it would be, but it was sufficient, at least at that point.

Kistiakowsky: Yes. Actually, I didn't take very much more math in college, so I must have had a reasonable preparation. I took calculus. At that time they didn't offer calculus in high schools. The high school stopped just before calculus, so I finished up with calculus in college.

Sherkow: Let me ask you this: if you had gone to that high school for fours years instead of three years--

Kistiakowsky: And if I had gone there willingly, because of a family move with which I agreed, it might have been very different.

Sherkow: Yes. I was just wondering if you would have felt that your preparation for science would have been as good or not?

Kistiakowsky: I don't know. I really don't know. If I had been assimilated into the culture I would be a different person.

BEGIN TAPE ONE, SIDE TWO

Sherkow: One reads a lot today about how you have to interest girls in their earlier years in terms of getting them interested in science and math and encouraging them into careers in science and engineering. I've especially read a great deal about how many women are not interested in engineering because they consider it a masculine profession. From your experience as a teacher and having grown up with somewhat of a science interest, how do you feel that we might work with this problem of interesting girls in these fields?

Kistiakowsky: I don't think it's a question of interesting them. I think it is a question of the thing that you raised, which is peer pressure. I really, truly, think that if it were made equally, socially desirable for a girl to do well in math, physics, and chemistry, as it is for her to do well--given that she's a girl who wants to do well anyway--in English, history, social studies, that she would end up doing those things, and if she had that kind of a mind, she would end up enjoying them.

I just think there is such a stereotype in this country of what is masculine and what is feminine. One of the things that is very unfeminine is to compete, particularly to compete with the boys, particularly at an age where you are just beginning to sort out the sexual side of life and to try and set up an interaction with the opposite sex. It just is very difficult. And it is reinforced by every magazine and by every television show that you see, that it's very important to be feminine or female and attractive to the opposite sex. And if the boys in high school make it clear that it isn't attractive to be good at math, particularly better at math than they happen to be, then that's going to kill it then. What will change this is when there is really,

truly, a change in attitude. I think we are beginning to see some signs of that change in attitude, but it's going to be a long time before it really comes to any kind of fruition.

The example that I can give you is the Soviet Union, where they have done an awful lot of things very wrong, but one thing that they did do, was to start, after the civil war, a massive propaganda campaign that women not only belonged in all phases of work, but they also belonged in all phases of professional activity. Also, women should have equal education and women should work exactly as the men did in true equality. It hasn't turned out that way in the Soviet Union either. There is not true equality between men and women, but, in my opinion, that's because another phase of their propaganda campaign never worked, which was that men and women should be equal in the home, equal in the housework, and equal in the child care. This never worked; the old Russian traditions just completely swamped that particular thing, and, until very recently, it was the women who did all the housework and all the child care on top of their professional jobs, which just makes life impossible in a country like that. But, the result has been that there in the schools, the girls do go into math, they do go into science, and they do test well in these things. You have classes graduating in physics that are fifty percent girls, and it's because there is a real emphasis that you're going to work, you're going to have a professional existence and that any profession is perfectly all right for a girl. This is what, I think, really makes it possible for people to discover what they want to do and what they don't want to do.

Sherkow: Given the fact that we don't have that, we have to have a massive attitude change. It seems like an insurmountable problem.

Kistiakowsky: You work at it as many ways as you can. I think if we have an equal rights amendment that will give a legal basis for a lot of things that may help. But, I think the fact that there is such a fight against it in this country is just an example of the phenomenon of keeping the women where many women have been told they belong. Maybe the problem is that if they have believed something which, in fact, was wrong, then they've wasted their lives. I think there may be an element of that in some of the opposition to ERA. If I spent all my life being a nursemaid to my husband and my children, and it turns out that I <u>really</u> didn't have to do this, I've fallen for something which was not a very wise thing to fall for. Otherwise, I can't understand why there is such a fierce, emotional opposition to it.

Sherkow: Maybe we can get into that later. You chose Mount Holyoke to go to.

Kistiakowsky: Yes. I talked it over with my father. I had initially thought of Radcliffe, and he suggested very strongly that I not go there, because Radcliffe had no faculty, and the best science faculty at Harvard was away doing war work; he felt that Radcliffe would not be a particularly good choice during the war. That was the reason that he gave me. There may have been other reasons, I don't know. As I say, I was young--I was a couple days short of sixteen when I went to college--and he may have felt that going to a school that was out in the country, I would be in a more protected environment. But he certainly <u>never</u> gave that as a reason. And Mount Holyoke had on its chemistry faculty a couple of women chemists of whom he had a very high opinion, so he knew that, scientifically-speaking, it was a very good school; that was the reason that he suggested I go there,

because it had a good science faculty. It also had a first-rate biologist, and since I wanted to be premed, it, of course, was important that I get the chemistry and biology.

Sherkow: Did you investigate any schools on your own or did you just feel that you would want to follow his advice?

Kistiakowsky: I wanted to follow his advice.

Sherkow: So you went there.

Kistiakowsky: So I applied there and I was admitted, and I went there.

Sherkow: Did you like it there?

Kistiakowsky: My memory is that I liked it very much, but if I really dissect it, minute by minute, I suppose it had its ups and downs. The academic aspect I liked very much. I particularly liked the professors in the chemistry department. I hadn't been there much more than a semester when I was convinced that I didn't want to be a premed, that I wanted to be a chemist.

Sherkow: After one semester?

Kistiakowsky: Yes. I switched to chemistry because particularly Miss [Emma P.] Carr was a most remarkable woman; she made doing research and being a chemist such an interesting, happy-looking kind of existence that it really was very appealing.

Sherkow: What changed your mind about premed? I mean, you were interested in the chemistry, but that didn't mean you had to drop premed.

Kistiakowsky: I don't really know. My pat answer to that is that I

smelt a biology laboratory and decided that I was not cut out to be a biological scientist. I don't know. I think it was, in fact, the course work. Chemistry, which had not been interesting, all of a sudden became interesting. So that's what I did.

Sherkow: This is an all women's college, right?

Kistiakowsky: Yes, it still is.

Sherkow: How did you feel about that? Did you enjoy that aspect of it?

Kistiakowsky: Yes.

Sherkow: And you had friends, right?

Kistiakowsky: Yes.

Sherkow: Did you have required courses that you had to take?

Kistiakowsky: Oh, yes.

Sherkow: How did you feel about those?

Kistiakowsky: The way any undergraduate feels about required courses you have to take. [Laughter] No. Actually, one of them was an English course that all freshmen had to take, and I had, as a professor, a poet. The only thing that enlivened the course was that he was so obviously suffering much more than the students--I mean, teaching this stuff to the students was so much more of a pain to him that it was to us sitting there and learning it from him that one felt sort of a motherly impulse to somehow get him through the semester. [Laughter] He's now a moderately successful American poet. His name is Robert Francis.

Sherkow: I don't know him.

Kistiakowsky: No, no. He's too recent to have anything other than a very narrow recognition. [...Interview interrupted...]

Sherkow: After you were there a semester, you got very interested in chemistry and decided that you wanted to be a chemist or that you just wanted to major in chemistry?

Kistiakowsky: I wanted to major in chemistry. Yes.

Sherkow: Did you take chemistry when you were a freshman?

Kistiakowsky: Yes.

Sherkow: What else did you take?

Kistiakowsky: I took the English course, I took chemistry, I took a math course. I don't remember whether I took a social science course--I probably did. I can't remember for the life of me. I had a bunch of social science courses, but I don't remember which years, specifically, I took them. I also took some more French at some point, and I took some German at some point.

Sherkow: But it was Miss Carr that initially got you very excited about chemistry?

Kistiakowsky: Yes.

Sherkow: Then after her, were there others?

Kistiakowsky: Yes. Another rather distinguished chemist in the department was Miss [Lucy] Sherrill. I didn't have her until later, because she taught the organic chemistry course. There was another

lady who taught quantitative analysis, and I must say she didn't excite me, because quantitative analysis was bubbles in burettes and ashes in crucibles and all kinds of misfortunes like that. [Laughter] It didn't take me very long to discover that analytic chemistry was not my bag.

Sherkow: What I'm getting at here is that it was the teachers that really interested you in chemistry.

Kistiakowsky: Yes. first of all, it was the people, but second of all, it was also some well-taught courses. I didn't take freshman chemistry. I was allowed to skip that, and instead I took qualitative analysis. So I went into a sophomore level course in my freshman year, and I think that had a lot to do with it.

Sherkow: Why were you allowed to skip freshman chemistry?

Kistiakowsky: Because they said that the college board in chemistry indicated that I could skip the freshman year. The courses at that time were at a much lower level than they are nowadays. Essentially, the usual freshman chemistry course in those days is the kind of chemistry you now get in a good high school course. I think, actually, they were doing me somewhat of a favor by letting me skip it, but I don't think I could have gone through Bessemer converters a second time.

Sherkow: You mentioned that they told you that you were a genius. How did that make you feel? Did you feel that you were smarter than everybody else?

Kistiakowsky: I told you so. [Laughter] No, I didn't believe it. I came home and I told my mother that I was a genius, and she told me, rather firmly, that I should keep my head size down. [Laughter] And I think,

even at that time, she pointed out to me the obvious, which was that I knew how to take these tests, and it was the first time that they had been given in the high school.

Sherkow: Did you receive any scholarships to go to Mount Holyoke?

Kistiakowsky: No.

Sherkow: How would you summarize your four years there?

Kistiakowsky: As I say, on the whole, my memory is that they were a happy four years even though there were some less happy moments than others. But, on the whole, that certainly is the way I would feel about it.

Sherkow: How about preparation for going on?

Kistiakowsky: Academically, I was not terribly well-prepared. I decided to go to graduate school and I wanted to go someplace where they had nuclear chemistry, because this looked like the interesting field to go into. Miss Carr tried very hard to talk me into staying at Holyoke for another year or two and getting a master's, because she said I'd have a very hard time if I went to any of the places like Berkeley or Chicago or Columbia, which were the three I applied to, simply because of lack of adequate preparation. But, I at that time felt that I wanted to go out and go to graduate school somewhere else, so I didn't take her advice. She was right. I went to the University of California at Berkeley, and it was a <u>very</u> painful first year there.

Sherkow: Because you weren't adequately prepared?

Kistiakowsky: I really wasn't at a level with other people who went

there. There were veterans who had bombed through Cal Tech in a couple of years, and people who had even gone to Cal Tech for more years than that; they had done twenty problems a day for four years. That just was not the kind of training that I had had.

Sherkow: How did you cope with that in the first year?

Kistiakowsky: At first, I looked disaster in the face, and then I met some very nice guys--I lived at International House--and I told them what my problem was, that I just couldn't do any of the problem sets, I was just having an awful time with them. And they said, "Well, why don't you come and join us, we work together on these problem sets, and we'll come in one of the common rooms." I House was sex-segregated, except for the common rooms, and they usually worked in the men's section because I was one of the very few women in science there. But they were nice enough to come to a common room where I could join them. Once I started to learn how to work with that kind of stuff, it was all right, and, eventually, the need for working with other people petered out. But I do owe that particular group of young men a great debt of gratitude for getting me over that hump.

Sherkow: Now, while you were at Mount Holyoke you felt that the science that you were getting was adequate?

Kistiakowsky: Yes.

Sherkow: But you didn't really know that it wasn't adequate to get into these classes?

Kistiakowsky: They were good science courses, but the trouble was the level just never got high enough. If I had stayed there and taken an MA, presumably I would have had some more advanced courses, and

I would have been better off. But it just was not as intensive a science preparation. Also, in numbers of courses: I think I took one chemistry course a year for the four years that I was there, and then I think I took physics for three of the four years, and math for maybe one or two of the years. But compare that with somebody who goes to MIT and really takes a heavy physics major.

Sherkow: Well, didn't you have counselors or one special counselor that could guide you along as a chemistry major?

Kistiakowsky: Even at that time it wasn't so usual for people to go on. This already was sort of past the time where women professors were delighted at having women students and encouraging them to follow in their footsteps. I went to Holyoke in 1944, and this was just at the beginning of the "back-to-the-home movement." The year I went there, they instituted a course called, "Home and the Family", and I think I was one of the very few of the 250 people in my class who never took that course. I even remember hearing Miss Carr say things like, "But of course, it's very important to have a marriage and a fulfillment of a complete life." You know, absolute rubbish coming from her lips. She was a very fulfilled woman even if she'd never had a marriage. But it worried those women professors at the time, because they were hearing the same thing that other people were hearing, and, I guess, they didn't want to give advice that might lead somebody to do something which that person would later regret.

Sherkow: Might there have been better places for you to have gone as an undergraduate?

Kistiakowsky: I don't think so, given that I was young--given they had women professors.

Sherkow: That was very helpful to you?

Kistiakowsky: It was very helpful to me. You see, at Holyoke I wasn't a loner. I wasn't an oddball. What I was doing was perfectly acceptable. It was very different from what most of the girls did. Most of them didn't work that hard, most of them were thinking of getting married, and most of them were engaged to get married by the time they graduated. But, it didn't make me that queer that I did work and that I was thinking of other things. Because there were women professors, and they were happy when you were interested in what they taught, and they did encourage you, there still was a feeling that this was a very good, acceptable kind of thing to do. I think it would have been different if I had gone to other schools. Now, there are exceptions. There are some coeducational schools where evidently this kind of attitude also existed for girls, but certainly it would not have been true at a place like the University of California, Berkeley.

Sherkow: At that time?

Kistiakowsky: At that time, at an undergraduate level.

Sherkow: So Mount Holyoke was good for you because of the female role models?

Kistiakowsky: That's right. I really think it was a remarkably fortuitous place for me to go. And it was worth the very tough time the first year in graduate school.

Sherkow: What did you do in your spare time at Mount Holyoke? Riding?

Kistiakowsky: First of all, I took a very heavy load of courses, and I always had some course that required library work. It was insanity

of some kind to take political philosophy at the same time that you had laboratory courses, because you went crazy between reading Karl Marx and Hitler and things like that and then spending time in the laboratory. So I did work fairly hard. And, I kicked around with my friends. [Laughter] I didn't play bridge.

Sherkow: Did they have clubs in college, like French clubs?

Kistiakowsky: Yes. I participated in French plays, and I participated in some other drama productions. I even had some moderately good roles. I was half of a dinosaur. I was a gentleman on the boardwalk in "The Skin of Our Teeth," and I was an old woman in "The Assumption of Hannele." I did a number of things like that. I was in the riding club. I guess I was in the French club, because the French club gave the French plays.

Sherkow: I can't think of anything else except sports, which I know that you weren't interested in, other than riding.

Kistiakowsky: They were requireds, so I did do some sports. But the only ones I can remember were riding, because you could take riding in place of a sport.

Sherkow: Did they have any politically active groups?

Kistiakowsky: No. There weren't. [Laughter]

Sherkow: They had religious groups?

Kistiakowsky: Yes. I had a very good friend who was Jewish and was responsible for the Sabbath services at the Hillel Association on campus. She was really very serious about her religion, and her problem was that there were Christian girls who wanted to go to the Sabbath services so that they could get their religious obligation out of the way and go away

for the weekend. You had to go to church. Church was a required thing. So if you could go to the Sabbath service then you were free for Saturday and Sunday. And she felt very strongly that this was totally inappropriate.

Sherkow: But were you one of those that wanted to attend Sabbath services?

Kistiakowsky: When I filled out the application blank for the college, it came to the point where you were supposed to write down what your religion was, and I had read the catalogue and I knew this bit about required church, so I very happily remarked to my mother, "I'm going to say I'm a Moslem, because Moslem women don't go to church." [Laughter] Unfortunately, my mother said, "You are not going to do anything of the kind." So I wrote down that I was a Protestant, and I ended up going to church.

Sherkow: I didn't realize that they had those kind of requirements.

Kistiakowsky: Yes. We had to go to chapel twice a week, and we had to go to church, I think, every Sunday, with a certain number of cuts allowed, except in our senior year. I guess the spring semester of our senior year we didn't have to do it anymore. That changed very shortly thereafter. That didn't outlast the war by much.

Sherkow: What about your social life? Was it easy to meet boys?

Kistiakowsky: The first year I was at Holyoke there were no boys. They just hadn't come back from the war--it was 1944-1945--and then they started to come back. It wasn't easy for me. It was something that I had never done before, and the girls that I knew best were not very date-conscious. So this is something that I didn't do, basically, until my senior year.

Sherkow: Was there a boys' school around there?

Kistiakowsky: Amherst is about ten miles away, and the University of Massachusetts is also in Amherst. So there are boys' schools relatively close.

Sherkow: Was your contact with men though those colleges?

Kistiakowsky: Actually, the contact that I finally established was with Yale. There was a mixer, or something equally awful, and I met somebody from Yale. So in my senior year I went to Yale a number of times, and he came up to Holyoke a number of times, and I got to know some people a bit more.

Sherkow: You didn't ever feel any kinds of problems with going to an all-girls school?

Kistiakowsky: No, I didn't. But there were many girls who did. There were many girls who felt that this was a very grave privation to be separated.

Sherkow: Why did you happen to feel differently? What was the reason?

Kistiakowsky: I guess because it wasn't very important to me.

Sherkow: Was your career more important to you, or your studies?

Kistiakowsky: I don't know the answer to that question. I really truly don't. I'm sure that it was mixed up with a bunch of things psychologically. I don't know. I don't have any wisdom to shed.

Sherkow: While you were going to Mount Holyoke, what did you do in the summertimes?

Kistiakowsky: The first summer I went back to Los Alamos. The second

summer I got a job at Woods Hole, and one of my friends from Mount Holyoke also got a job at Woods Hole, so we shared a room there.

Sherkow: Doing what?

Kistaikowsky: She worked at MBL, basically washing glassware--MBL is Marine Biological Laboratory. I worked at the Woods Hole Oceanographic, printing photographs. They had negatives of underwater explosions of which they needed printed a hundred copies for reports. So I printed a hundred copies of an endless stream of negatives for reports.

Sherkow: All summer?

Kistiakowsky: Well, fortunately, not quite all summer. They ran out of these negatives, and I got to do some work in a drafting room which was a lot more fun.

Sherkow: How did you get involved in this summer job? Why?

Kistiakowsky: Why did I get a summer job? Basically because I didn't want to sit around doing nothing all summer, and I guess I was too old to go to camp. Also, I had not very good memories of my two years at camp, when I was a young child.

Sherkow: Well, some people go to summer school, as opposed to working. Nowadays, most people work or go to summer school or do both.

Kistiakowsky: Yes. My guess is that I would have been discouraged from going to summer school, because I think my father had the feeling that I was young enough as it was, that there was no point in getting through college in a hurry. I could have gotten through Holyoke in

three years, and I think I broached the subject once to him. I'm not quite sure whether I did or I just talked it over with an advisor. But in any case, somebody discouraged me from trying to get through in three years rather than four. I think it probably was a good thing.

Sherkow: I was also wondering how you got this job?

Kistiakowsky: I got the job through my father, but I don't know whether I asked him to get me the job or whether he suggested it. I just don't remember.

Sherkow: What did you do the following two summers?

Kistiakowsky: The next summer I got a job in Silver Spring, Maryland, where my mother and stepfather were living. I guess my stepfather got that job for me. It was at the Johns Hopkins Laboratory there, and I did calculations of rocket trajectories.

Sherkow: What is your stepfather's occupation?

Kistiakowsky: He's a physical chemist. And that was more interesting than the previous summer, but it was sitting in an office all day, so in that sense it was a little more confining.

Sherkow: And then your last year?

Kistiakowsky: The year before I went to graduate school, I didn't work. I visited my father on the East Coast for one month and then I visited my mother. My stepfather and mother had moved to Los Alamos at that point so I went and visited them in Los Alamos for a couple of months.

Sherkow: Was your stepfather involved in that work, too?

Kistiakowsky: During the war, no. During the war he was in Mount Lebanon, at Bruceton Laboratories. But, after the war he went to Los Alamos, essentially in the same position that my father had had during the war. He just will retire from Los Alamos on the thirtieth of April [1976].

Sherkow: I mentioned the summer jobs because at this years' [1976] AAAS meeting, one of the younger members of the panel, Gail Hanson, really emphasized that the work that she had done as an undergraduate at MIT during the summers had really helped her in formulating her career ideas, in helping her in innumerable ways: in getting a job after college, and so on and so forth.

Kistiakowsky: I'm sure that having done this work helped me to get into graduate school, because if all I had had to go on was my record at Mount Holyoke, I might have looked like a rather soft prospect for graduate school. Speaking now as somebody who evaluates applications, you worry a little bit about somebody who has done nothing but academics, even if they have done well in academics. Something like a summer job indicates a certain amount of ability to survive on your own. And good recommendations on a summer job...God knows, I'm sure that the Oceanographic would never give me a good recommendation for those hundreds of pictures that I printed. [Laughs]

Sherkow: But you were always in a scientific atmosphere, even though you weren't always doing scientific work?

Kistiakowsky: Yes.

Sherkow: I think that's important.

Kistiakowsky: Yes. Even the second summer that I was at Los Alamos, I had a job.

Sherkow: You did? You didn't mention it.

Kistiakowsky: Yes. I worked in the pharmacy there as a pharmacist's assistant. The lady who ran the pharmacy was the wife of a physicist. Los Alamos was unique in that it was a rather limited community in housing so that wives were happily welcomed when they wanted to work. Ethel Froman, in fact, ran the pharmacy in the hospital, and since my father knew her, it was felt that this might be an appropriate place for me to be because of my interest in chemistry. And that was sort of fun.

Sherkow: Did you meet other people at Los Alamos this second summer, when you were a year older?

Kistiakowsky: Yes, but I tended to just get out of the pharmacy and get to my horse. I had a horse again.

Sherkow: Did your father buy it or did you just use the horses that were there?

Kistiakowsky: The second summer, I guess, it wasn't bought, it was rented for the summer, basically. It was my horse, nobody else rode it, and I took care of it and everything else. But unlike the first summer where the horse was actually purchased and then had to be sold--which was a real heart-breaker--this time it was just a rental arrangement.

Sherkow: So you were more interested in riding than anything else?

Kistiakowsky: It represented freedom and independence.

Sherkow: Right. One of the projects of the Program is this book, that I think I've mentioned to you, on Oppenheimer.

Kistiakowsky: I went riding with him there.

Sherkow: Right. He rode a lot.

Kistiakowsky: Yes. Oppenheimer loaned my father one of his horses and that's the horse that my father rode those two summers that I was there. As a matter of fact, I have a picture of the horse upstairs.

Sherkow: That's right, he and his brother were avid riders. And they had a cabin in New Mexico.

Kistiakowsky: That's right. He was the one who suggested the site for Los Alamos, because he knew about the school that was there, and he knew that the mesa was big enough to accommodate such a large project. It's a magnificent natural setting. It's really beautiful. I wish other government laboratories would display the same kind of taste in their choice of a location.

Sherkow: So when you were there those two summers, it was more like freedom than meeting a number of prominent scientists?

Kistiakowsky: Yes. I met them, because I still, to this day, will meet people who will say, "Oh, yes, I met you--I knew you in Los Alamos;" that's even worse.

Sherkow: And you don't remember them?

Kistiakowsky: No.

Sherkow: Well, as an adult they might have noticed you.

Kistiakowsky: I was pretty doggone adult. I mean, I was fifteen going on sixteen the first summer and sixteen going on seventeen the next summer.

Sherkow: Is that an adult?

Kistiakowsky: From my perspective looking down at my kids, no. [Laughs] No, seriously, that's old enough to pay attention to people. And there are some people that age that really do. I can think of a couple of young people I know who at that age are very adult in their interactions with other people and don't discriminate against older types.

Sherkow: So you saw yourself then as being an adult, but you didn't interact with the other adults there?

Kistiakowsky: Yes.

END OF SESSION

MIT ORAL HISTORY PROGRAM

Project on Women as Scientists and Engineers

Interview with Vera Kistiakowsky by Shirlee Sherkow

Cambridge, Mass. May 11, 1976

Session 2 transcribed by Johanna Kovitz

Sherkow: This is May 11th, 1976, and it's the second interview with Vera Kistiakowsky by Shirlee Sherkow. Last time that we met, we ended the first session with Mount Holyoke and your four years there, and you majored in chemistry. I was wondering at what point did you switch from chemistry to physics? Wasn't your advanced degree in physics?

Kistiakowsky: No. I went to the University of California at Berkeley as a graduate student in the chemistry department, because I wanted to do nuclear chemistry. I worked with Glenn Seaborg, who was a professor in that department and also the head of the chemistry section of the radiation laboratory. I didn't become a physicist until after my Ph.D. Actually, by the time I was two-thirds through my graduate work, I discovered that I really wanted to do physics and not chemistry. You know, nuclear chemistry is betwixt and between. It's more physics than chemistry, and it was clear to me that the chemistry parts of it didn't interest me at all, and the physics parts of it were what interested me. But a number of people suggested that it would be wasteful to essentially drop investments of two and a half years of graduate work and start all over again. I don't know to this day whether they were right or not, but I took their advice.

Sherkow: Well, at what point in your own mind did you decide that you wanted to go for an advanced degree?

Kistiakowsky: Essentially I knew that when I went to college, except then I was thinking of getting an M.D. So it was just a question of switching the direction that I was going in. As I got to know more and more about physics, and it ceased to be frictional forces and things like that, which were really pretty dull--which is what high school physics was--it became modern physics as it was presented at the University of California, it became clear that that was what was interesting to me.

Sherkow: Okay. I wondered how you decided to go to U.C. Berkeley for your advanced degree.

Kistiakowsky: I applied to three places: Columbia, Chicago, and Berkeley because those were three places where they have nuclear chemistry, and this was what I wanted to do. Berkeley offered me a teaching assistantship, so I went there. Actually, I think Chicago offered me support, too. Berkeley offered the support first, and, I guess, it was basically that Berkeley is a nicer place to live than Chicago that prompted me to go there. But the real reason was the availability of the nuclear chemistry.

Sherkow: You decided <u>after</u> you graduated from Mount Holyoke that you wanted to go into nuclear chemistry?

Kistiakowsky: No, while I was at Mount Holyoke; while I was a senior, I decided. So I knew what kind of a graduate school I wanted. Yes. Because my senior thesis at Mount Holyoke was to build a geiger counter

and measure some radioactivity, I was already headed in that direction; I knew what I wanted to do.

Sherkow: Were there courses in nuclear chemistry at Mount Holyoke?

Kistiakowsky: No.

Sherkow: I did not think so. So you had decided at Mount Holyoke that you were going to go on for a Ph.D. Once you were at Berkeley, at some point did you have to specialize?

Kistiakowsky: Well, the first year I was supported by a teaching assistantship, and so I didn't have to specialize in anything. I took courses, mainly. But in the second year, I asked Seaborg if I could work in his laboratory, and that carried with it a research assistantship which supported me financially. And at that point was when I officially decided. But, you know, I really knew when I came there what I was going to do.

Sherkow: So nuclear chemistry is the specialization?

Kistiakowsky: Yes.

Sherkow: I was wondering about yout thesis, because on one of your earlier resumés that I had gotten from the historical collection, the thesis topic was indicated. I was just curious as to how you decided on your thesis topic.

Kistiakowsky: I was told.

Sherkow: You were told! By your advisor?

Kistiakowsky: That's right. This was just when there was a great deal

of interest in the regularities between the stability of the elements, just at the time Maria Mayer published her theory on the explanation for these regularities. And so there was great interest in the rare earth isotopes, because they were in the region of one of the so-called magic numbers, one of the regions of great stability. And if you just go off the edge of that stability, you get things that are quite unstable. An explanation for the fact that promethium has no naturally stable isotopes was, in fact, that it was just off the magic numbers. Therefore, it was very interesting to try and find out what promethium isotopes actually were like. I don't really know who suggested it as a project, but it certainly was either Seaborg or one of the people in the group there.

Sherkow: But you're also indicating that your primary interest might not have been in that particular topic?

Kistiakowsky: Well, there are two parts to that topic. One part is pure physics, and that is the radioactive properties of these isotopes: how stable they are, how unstable they are. And that's physics. The other part of the topic is producing them, and cleaning them up of everything else. And that's analytic chemistry. I very rapidly discovered that if there were other ways of doing this than analytic chemistry, I'd prefer to do it. So, the physics part was very interesting. As I say, it really is a borderline field. The chemistry parts and I didn't work out too well together.

Sherkow: At U.C. Berkeley, I was wondering if there were any particular teachers that you either remembered well and/or liked well? I was wondering if you could make some comments on the faculty there in your specialty or your field?

Kistiakowsky: Well, by and large, the courses I took weren't in a specialty. They were general courses in chemistry, and I also took courses in physics, because of the fact that that's the direction my interest went. On the whole, I really can't remember very many. An exception was Geoffrey Chew, who is a very well-known theoretical physicist, who at the time was a very handsome young man, and I remember taking a rather elementary physics course with him. I forget exactly what it was; some kind of elementary mathematical physics course, which had the highest density of women graduate students I have ever seen in a physics course anywhere. Really very funny.

Sherkow: Well, did you have any women teachers?

Kistiakowsky: No. Not one.

Sherkow: That's dismal.

Kistiakowsky: Yes, it is. And, oh, there were some other good people. I had quantum mechanics from Robert Serber, and that was a very clear, well-presented course. I also heard another version of quantum mechanics from Robert Oppenheimer. That was a very interesting course, but I didn't take that; I just listened to it. And I'm sure if I dredge my memory, I can come up with other courses that were interesting.

Sherkow: The question had come to my mind because of Mount Holyoke, and that there were teachers there that you really remembered and liked very well.

Kistiakowsky: Yes.

Sherkow: When you went to school at Berkeley, were there other women in

your classes, women that were going for their Ph.D. degrees?

Kistiakowsky: Yes. There were a number of women. One, Betsy Stover, got her Ph.D. in nuclear chemistry, I guess, a year before I did. And there was a young woman, Doris Heisig, who was in physical chemistry, and then she decided she really didn't want to have a Ph.D. She wanted to get married and have a family; so she quit physical chemistry. She married [Kent M.] Terwilliger. And she was a really bright girl. I mean, there was absolutely nothing preventing her from being a first-rate scientist, except the fact that she thought being a scientist and being married were incompatible. I still am in very distant contact with the Terwilligers. And now that her family of four boys has grown up, she has gone back to work teaching remedial reading, which I think is somewhat of a waste.

Sherkow: It's too bad, right.

Kistiakowsky: Yes. But people have to make their own lives.

Sherkow: Right. So how long were you at U.C. Berkeley, in terms of years?

Kistiakowsky: I was a graduate student for three and a half years, but I stayed an extra half-year, just to do a little bit of post-doctoral work. The following year I worked for the United States Naval Radiological Defense Laboratory in San Francisco, and I couldn't stand it. So I got a fellowship, and I went back to Berkeley on that fellowship, but this time in the physics department with Professor Alvarez, doing no chemistry, none whatsoever.

Sherkow: So you lived a number of years in California, and especially

at the U.C. Berkeley campus. What was your social life like, in general?

Kistiakowsky: The first three years I lived in International House, and I wasn't wildly social. For one thing, I had an awful lot of catching up to do, in terms of academics. Then, when I started to do research, that put a pretty heavy pressure on my time. But I folk danced and I got to know some people, and I met the person who was later my husband.

Sherkow: You met him at U.C. Berkeley?

Kistiakowsky: At International House. We were both residents there. It was one of these things where the older residents greet the newer residents, and I had a badge on saying, "I am--" and I went up to him and I said, "How do you do" I am--." [Laughter]

Sherkow: I was going to ask you about your husband and your marriage and your career later on, so I will be getting back to that. While you were at U.C. Berkely, did you ever experience being the only girl in class?

Kistiakowsky: Oh, yes.

Sherkow: How did that make you feel?

Kistiakowsky: Well, I don't really remember. I do know that I felt somewhat "out of it" there. It was mainly because at International House the men who were taking a physics course or whatever worked together. They did it in the common rooms on the men's side of the house, which meant that a woman couldn't go there. At first, this was a very serious problem, but when I got to know some of them a little bit, I pointed out that I was drowning; "Help, help!"

They moved some of their study sessions into really common rooms, where I could also join them. As a matter of fact, that group of young men were very nice and very supportive in treating me as a future colleague rather than an oddity. But, by and large, the place was set up so that women were, in fact, unusual in the sciences. As I said, there were a few, but I think in many of the courses I took, I was the only woman.

Sherkow: Did that affect your having female friends at all?

Kistiakowsky: I didn't really have female friends. My roommate the first year was a very nice person and was very concerned and motherly about my struggles at Berkeley. She took me home, and she lived in Los Angeles; so she took me to the Rose Bowl Parade and things like that. She really was very nice, and we got quite friendly. I also got to know some of the other women a bit. Yes. Lila Eisberg, who was then Lila Wells, became quite a good friend. We roomed together one summer. She was in physics too. She stopped with a master's--she didn't go on to a Ph.D.

Sherkow: Was that a common thing?

Kistiakowsky: Yes. That's what many of the women did.

Sherkow: But not the men?

Kistiakowsky: Not the men. No. No, it's in the statistics too. Women stop with a master's twice as often as the men in science.

Sherkow: While you were at Berkeley, did you have mentors?

Kistiakowsky: No. Yes, in the form of the young men that I worked with; in a sense, they were mentors. They were much more sophisticated

academically; a number of them were veterans, and therefore they were much more mature. Certainly all of them were helpful. But it was in a very informal, very loose sense.

My thesis advisor, I saw once a month, and I told him what I was doing, and he said, "That's fine, keep on doing it." --[Interview interrupted]--I was saying that I saw Seaborg once a month, and he said, "That's fine, keep going." And that's essentially all he said, until one day he said, "Your thesis is due in three months." And I said, "But, but but but but but but." And he said, "Your thesis is due in three months." That was it. But there were other scientists in his group, from whom I did get advice and assistance. It really wasn't just me all by myself; there were other people there.

Sherkow: Did you have any fellowships or scholarships while you were at Berkeley, other than this assistantship?

Kistiakowsky: No. I had first the teaching assistantship, and then the research assistantship.

Sherkow: Did you have any relevant summer jobs while you were going to graduate school?

Kistiakowsky: I worked on the research assistantship. It's a year-round thing.

Sherkow: Did you enjoy living in California?

Kistiakowsky: Yes. It was very pleasant. I missed having seasons. I really like having winter and spring and summer; it was all pretty much one and the same thing. But Berkeley is a lovely place.

Sherkow: I lived there for a year, so I know what you mean about the

seasons. Especially Christmas and wintertime. I kind of missed that. Well, at what point did you specialize in high energy physics?

Kistiakowsky: Oh, that was a lot later. I was first in nuclear chemistry, and then when I was a post-doctoral, I switched to nuclear physics. When I went to Columbia, I moved up to a different kind of nuclear physics, slightly higher energy nuclear physics. When I came up to the Boston area, I went into what is usually called high energy physics. So it was a gradual shift upward.

Sherkow: Right. You mentioned that your first professional job after you graduated from Berkeley was at the U.S. Naval Radiological Defense Laboratory, for a year. Could you talk about that?

Kistiakowsky: Oh yes. Before I got my Ph.D., I went to see Seaborg, and I said, "I need a job for next year," because I was married, and my husband didn't have his degree, so I'd have to stay in the area. And he said, "Well, I have just the thing for a young, married woman who obviously is going to have a family. Why don't you become a scientific editor?" And in those un-consciousness-raised days, all I said was that I didn't want to be a scientific editor; I really wanted to stay an experimental scientist. Well, it's clear that he thinks that a woman's place is in the home, judging by his own family. He was not willing to push me for a very prestigious job, simply because I guess it was his opinion that I would very shortly drop out and cease being a scientist.

Eventually he suggested me for a couple of jobs. One was a small, local company that was making instrumentation for nuclear chemistry and nuclear physics, and the other was the U.S. Naval Radiological Defense Laboratory in San Francisco. I made, I think, the wrong

choice. I think I would have been wiser to go to the small, local company. But the San Francisco laboratory said that I could do research on radioactive elements. My charge would be to build detection equipment, to study radioactivity, and that I could actually do such research. The problem was that, shortly after I got there, I discovered that as a government employee, I could be plucked off what I wanted to do at an instant's notice, and asked to do the primary mission of the laboratory, which turned out to be to analyze sea water from the vicinity of atom bomb blasts--you know, battleship scrubbings and--

Sherkow: So you had to do that kind of work?

Kistiakowsky: Yes, and that was pure analytic chemistry. I mean, there was no physics to it. It was pure and simply analytic chemistry, and I wasn't good at it, and I detested it. So, after half a year there, I started casting around for other sources of support so that I could go back to Berkeley and do some research again. I found that, perhaps because of my peculiar background, that I was really a nuclear chemist, but I was not encouraged towards applying for any of the really glamorous fellowships. So I applied for an American Association of University Women fellowship, and got it, and it didn't pay very much, compared to what I had been earning. I had been earning over seven thousand dollars at the defense laboratory, and the fellowship paid two thousand dollars.

Sherkow: That's terrible.

Kistiakowsky: But I took it like a shot. It was freedom, in a very real sense. So I quit and pointed out that I was quitting to go to

something that paid infinitely less but was infinitely better. I had a lovely year at Berkeley, doing exactly what I wanted to do, in terms of research.

Sherkow: What was that?

Kistiakowsky: I investigated the half-lives of some very short-lived radioactive isotopes that I produced by bombarding various rare earths at the linear accelerator there. So I had to make my radioactivity and measure it instantly. I made my own equipment, and I essentially did everything all by myself. I had a very good year, and actually got some good physics out of it--publications out of it.

Sherkow: It was just supposed to be for a year?

Kistiakowsky: Yes. It was a one-year fellowship, and so it had to be research that could be completed in one year. Also, my husband finished his thesis at the end of that year. So the end of my fellowship coincided with the end of his graduate work.

Sherkow: What field was he in?

Kistiakowsky: He was also in nuclear physics.

Sherkow: What was your next job after this one year fellowship?

Kistiakowsky: We looked in various places all over the country for work. I don't know how many letters I must have written to various places. Very discouraging. Most of them didn't even bother to answer. Few gave me a turndown.

Sherkow: Do you think that was because you're a woman, at all?

Kistiakowsky: I would imagine it might have had something to do with it. But I got one lovely letter, which I can remember with pleasure to this day. It was from a Jesuit priest at Boston College. In my innocence, I had written asking if they had a vacancy on the faculty. At that time, of course, the faculty was Jesuit, and the student body was completely male. He really wrote me back a lovely letter, thanking me for applying, wishing that things were otherwise so that they could consider me, but explaining to me that, in fact, this really wasn't a terribly reasonable place for me. But he didn't say it that way. It was such a nice, friendly letter. You know, he was the one person who took any effort to reply.

Sherkow: I imagine that still happens a lot today, too.

Kistiakowsky: Yes. The way we ended up at Columbia was that Gerry heard that there was a job there in the physics department, an instructorship. I don't know how the information was passed on that there was actually a scientific wife attached to this person who was applying for the instructorship in the physics department. But I was offered a position as a research associate in the chemistry department, at first, but I would be working in the physics department with Professor Chien-Shiung Wu, who, at the time, was purely a nuclear physicist; I would be a nuclear chemist working with her. Since the job that was offered Gerry was one with a very good future, this seemed like a reasonable thing to do, and so that's what we did. Except, when I got there, I discovered I still didn't like chemistry any better than I had before. By the end of the first half-year, I had told a number of people that I really, truly would much prefer to be doing physics. A lot of what I did was physics, because I had freedom

to participate in other experiments, so long as I did the chemistry that was necessary to her. I guess she also discovered that as a chemist, I was not an ideal choice. I am sure that she must have supported me in what I wanted to do, because if she had really fought it, then it never would have happened. So she must also have decided that there was some reason to give me support in going on and doing physics. In any case, the second year I was a research associate in the physics department, and I started a program of experiments at Brookhaven National Laboratory, which had the closest [medium energy] accelerator. Then I became an instructor in the physics department.

Sherkow: Did your husband also have an appointment at Columbia?

Kistiakowsky: Yes. He was first an instructor in the physics department, and than an assistant professor.

Sherkow: I see. So they apparently didn't have nepotism rules there. Right?

Kistiakowsky: Yes. I guess there was no overt nepotism rule.

Sherkow: At any point while going to school and getting all these degrees, did your father's reputation encourage you to either go on or finish? I remember I asked you before, "Did a famous father encourage you or support you?" But you said, "Well, he wasn't famous," when I asked you.

Kistiakowsky: Well, at that time, he certainly was very well-known. I don't think it had very much to do with my finishing or not. But I am reasonably sure that one of the reasons that Seaborg took <u>any</u> interest in me at all was that I was my father's daughter. Well, that's not fair. Betsy Stover got her degree with him too, so that's

not quite fair.

Sherkow: But you think it had some effect?

Kistiakowsky: I'm sure that it had some effect on other people, even if it didn't have an awful lot on me.

Sherkow: Does work in high energy physics always entail working with [high energy] accelerators and bubble chambers and similar things?

Kistiakowsky: [High every] accelerators, yes, but not necessarily bubble chambers. There are all kinds of detection devices you can use. You've got to have something to make the high energy in order to do the experiments.

Sherkow: Does work in this particular field usually involve travel to one of the [high energy] accelerators?

Kistiakowsky: Well, when I was at Berkeley, the [high energy] accelerator was right there in Berkeley in the radiation lab.

Sherkow: But are there a number, all around the country?

Kistiakowsky: There used to be more. There are now fewer. The ones that still exist are at Stanford, Fermi National Accelerator Laboratory, Argonne National Laboratory, and Brookhaven National Laboratory.

Sherkow: Right now are there any in Massachusetts?

Kistiakowsky: No.

Sherkow: That's what I thought. While you were at Columbia, you were an instructor, right?

Kistiakowsky: Yes.

Sherkow: You weren't solely doing research?

Kistiakowsky: That's right.

Sherkow: Were you doing research and teaching?

Kistiakowsky: Oh yes, of course. Yes.

Sherkow: Had you always been interested in research and also teaching?

Kistiakowsky: Well, let me first say that in this kind of physics in particular, and in fact, in a number of branches of physics, the most prestigious jobs are at the prestigious academic institutions. So, if you want to be in the position to do the best forefront research, a good academic institution is the place to go. There are now possibilities at the national laboratories for high energy physics, so it's not quite true. But to a good approximation, it's still true that the professor at a first-rate university is a better thing to be than a staff scientist at a big laboratory. You have to be careful; there are professors and there are professors; and there are scientists and there are scientists.

Also, in a field like solid state physics, where you don't go to the national laboratories but you work in industry, it is still true that academia is slightly more prestigious, on the average, than industry. There are industrial positions that are more prestigious than the academic positions, but I'm just talking about the average.

Since the prestige is connected with the ability and freedom to do research, this really is a powerful push to end up at an academic institution, whether or not you're interested in teaching. The result is that there are many people who are professors who are lousy teachers, and who have very little interest in teaching, and if

they're responsible people, they discharge their teaching obligations. Presumably, they all are responsible people.

Sherkow: Do you mean that they have somebody else do their teaching?

Kistiakowsky: No, they do it themselves, but without any terribly great interest in what they're doing.

Sherkow: I see. So your interest was always in research?

Kistiakowsky: My primary interest was in research. I enjoy teaching, and I try to do a good job of it, but it wasn't the motivation on being at an academic institution.

Sherkow: Did you and your husband leave California because both of you couldn't get positions there, or because you both didn't want to? I mean, you went from California to Columbia.

Kistiakowsky: We went to Columbia because that was the best position--

Sherkow: For both of you?

Kistiakowsky: Well, I guess, in a sense. It certainly was the best position for him, so averaged between us, it was the best position for both of us. In retrospect, it was a good thing to have done. It was a wise choice.

Sherkow: You stayed at Columbia from 1954 to 1959.

Kistiakowsky: A long time; that's right.

Sherkow: That's only five years. But all that time you were doing teaching and research, primarily in physics?

Kistiakowsky: Well, the first two years, I just did research, and then the last three years, I did more teaching.

Sherkow: You were in physics?

Kistiakowsky: In the physics department after the first year.

Sherkow: After Columbia, you went to Brandeis. Why did you go to Brandeis?

Kistiakowsky: My husband did not get promoted at Columbia, and he had to look for a job elsewhere. I could have stayed at Columbia. I would have been offered an assistant professorship if I had stayed, and presumably, I might have gone up the academic ladder; I don't know. But, in any case, he had to go somewhere else, and it wasn't entirely clear to me that I would leave Columbia. But then I became pregnant, and all kinds of people, from the obstetrician to my father, and, of course, my husband, were leaning on me not to decide to stay at Columbia and try to, essentially, bring up a child by myself. Eventually, when he got a position at the Cambridge Electron Accelerator, which was right here at Harvard, I looked in the Boston area and got the job as an assistant professor at Brandeis.

Sherkow: You were at Brandeis for four years; from 1959 to 1963?

Kistiakowsky: Yes.

Sherkow: Was that in physics?

Kistiakowsky: That was in the physics department.

Sherkow: What did you do at Brandeis?

Kistiakowsky: Well, the first academic year I mainly did teaching. My son was born that summer, and I discovered that having children was very different; I just hadn't anticipated what kind of emotional impact and what practical consequences it would have. From leading a very individual life in an apartment in New York, I, all of a sudden, was in a house in the suburbs with a baby and a young woman to take care of the baby, and a whole bunch of things to cope with. On top of that, I had slightly heavier teaching responsibilities at Brandeis than I had had at Columbia. So the first academic year, I didn't do research. I just did the teaching at Brandeis.

Then the following summer, I joined one of the faculty at Brandeis, who was collaborating with a high energy group that involved MIT, Harvard, and Brown. And that's how I got to know the group at MIT, and started working with them as a faculty member at Brandeis. They were doing bubble chamber experiments at Brookhaven at the time. But they were planning a bubble chamber for the Cambridge Electron Accelerator. From that time on, I did experimental high energy physics with that group.

Sherkow: In 1963 you left Brandeis, and you went to work at MIT in the lab for nuclear science. Why did you switch from teaching and research to pure research? Is that correct?

Kistiakowsky: Yes. Well, the reason is sort of two-fold. One side of it was, as I say, having children--my daughter was born two years after my son--and that was a deliberate choice, to have a second child. It just took a very big chunk of my life.

Sherkow: In terms of time?

Kistiakowsky: Not really in terms of time--in terms of commitment. Previously, I had been sort of totally committed to my existence as a professional. I mean, the family obligations were sort of minimal; it was two young people living together, and there was no reason that I should do Gerry's work for him. But once there were children in the household, it evolved on me to see that all of that kept going. So there was extra commitment of time, but more than that, it was the feeling that if I made a dumb decision, the consequences were going to be wreaked on two helpless, small beings about whom I cared a great deal.

I sort of overestimated the effect of small crises on the ultimate well-being of children. I read all kinds of stuff that was published at the time, including Dr. Spock, who said things like: "A mother, if she really has to work to support the family, of course you can excuse her for working to support the family; but, otherwise, she should stay home." Those kind of things didn't help my mental well-being when there was a crisis. The result was that I was torn between seeing that the house and the children were okay, and really pushing my career. That isn't the way to push a career: pure and simple. I did research; I did teaching; but I didn't do nearly as good a job of the research or the teaching as I would have, if I had been single-minded in it.

The result was that my advice to the Brandeis senior faculty was not valued very highly, and, therefore, they did not take my advice on whom they should hire to augment their experimental high energy physics program. They hired somebody with whom it was clear to me I could not work, from the instant I met him. The man who had been there before was not a terribly effectual scientist, and so he was not very much

in this picture. It was just a question of whether this new person would control the high energy program and I would sort of help out in a dutiful female role, or whether, in fact, I would have an equal right to the money and an equal right to the decision of what experiments would be done. Essentially, I lost the first round on that, and I quit. This first round had been conducted mainly between me and the chairman of the department.

When I quit, some other people in the department whom I knew got rather upset with the fact that I had quit, and asked the people at MIT about my research; they got some letters of recommendation, basically, for me, and came to the conclusion that the arrangement that had been suggested was inappropriate. So a new arrangement was suggested, whereby I would be, essentially, not quite an equal partner in the money. It was an arrangement where we could fight each other to a finish to see who came out on top, and at that point I just chickened out. I just could not see having two kids and a household, sort of pulling on me emotionally, and, at the same time, fighting somebody whom I really considered a very unpleasant person, who had been saying all kinds of most unpleasant things about me to my back--not to my face. It was just a poisoned situation, as far as I was concerned. When I had first quit, I had asked Irwin Pless, who was at MIT: Could I work for him? He had said, "Yes, immediately, if not sooner." Since I had that guaranteed job at MIT, which would allow me complete freedom to do research, which, essentially, would protect me from any kind of political involvement and any fighting, it struck me like a sensible thing to do. So that's what I did. That's why I quit Brandeis.

BEGIN SIDE TWO

Sherkow: What did you do at the MIT lab for nuclear science?

Kistiakowsky: When I was a staff member in the Laboratory for Nuclear Science, I just did research in high energy physics: the same thing I'd been doing at Brandeis, except now in the MIT group. At first I didn't have any connection with MIT as an academic institution; I just had a connection with it as a research institution. This was mainly while my children were small, and it lasted until the last half of the sixties. Then I started teaching, even though I was still a staff scientist. Well, maybe it was even the middle sixties that I started teaching again, on a volunteer basis. It wasn't that this was involved in my salary, but I volunteered to do it. I participated as an active member in all the research and built up some good credits, both at MIT and nationally, for the kind of stuff I was doing. I also had very strong supports from Irwin Pless, in particular, and my other colleagues also.

Let me say that in a situation like that, where you're a member of a group that is made up of faculty and non-faculty, if you are non-faculty, it is assumed that the faculty are the people who are the decision-makers and contribute the ideas in the group. If you don't have colleagues who are very honorable, and perhaps even more than honorable, but very careful to make sure that your contributions are well-identified, you can completely disappear, in terms of any recognition. The fact that people knew that I did the physics that I did is because, as I say, those colleagues, and Irwin Pless in particular, were very careful that I got recognition for what I did. But given

this setting, I acquired the necessary credits so that I was made a senior research scientist in 1969.

This position is, essentially, a form of tenure. The previous appointment was, essentially, a year-by-year appointment in the Laboratory for Nuclear Science, but with no threat of termination. The only threat of termination was if the money ran out or something like that. But, in principle, it was a continuing appointment. However, the senior research scientist had a three-year rolling tenure on it, meaning that if the money ran out, the department would pay my salary for three years before I had to leave, and that's additional security. The other aspect was that it was a physics department appointment rather than a laboratory appointment. Because of this, I got more involved in the Institute and became more aware of what was going on. My children were growing older, so the nature of my involvement with my children in the house was very different; it gave me a feeling of greater freedom to do a variety of things. But I still continued to do what I'd been doing all along, which was research in high energy physics.

Sherkow: You just had a different title and tenure.

Kistiakowsky: That's right. And then, ultimately, I was put up for a professorship.

Sherkow: Who does that?

Kistiakowsky: Well, in particular, it was Irwin Pless, who suggested me for a professor in the department, and I had the support of my other colleagues too: Bob Hulsizer and other people who knew that I was doing. The case was argued, and after somewhat of a hassle, eventually, I was made a full professor.--[Interview interrupted]--Actually, it <u>did</u>

change things. It was interesting. It wasn't that I really did anything very different, but I found that I got treated very differently. It irritated me a great deal for quite a while, and still does, to some extent, that people who didn't even used to notice I existed, all of a sudden noticed I existed in a big way. Because, you know, I haven't changed all that much.

Sherkow: But now you were a full professor.

Kistiakowsky: That's right.

Sherkow: There are always people like that, aren't there?

Kistiakowsky: But a surprising number.

Sherkow: At MIT?

Kistiakowsky: Yes.

Sherkow: It's too bad.

Kistiakowsky: It's too bad, yes. It took some getting used to that people treated me differently. I guess I've come to grips with it now; I'm at ease with my so-called exalted rank.

Sherkow: So, from 1972 to the present, you've been a professor in the physics department at MIT?

Kistiakowsky: That's right.

Sherkow: Have you taken on more teaching than you used to do?

Kistiakowsky: No, because professors in the physics department have as their first responsibility to do the outstanding research in the country.

Sherkow: Is that one reason why you liked working at MIT?

Kistiakowsky: Yes. Participating in the research at MIT was a very great opportunity. It still is; we're doing some very interesting physics.

Sherkow: Had you considered becoming a professor somewhere else?

Kistiakowsky: Well, a number of people , including my father, suggested that I might go to a women's college and become a professor, or go somewhere else which isn't so competitive. I'm in one of the most competitive fields of physics, at an institution that has very competitive groups in it. So it's not the ideal background for somebody unless they're willing to be part of this whole attitude.--[Interview interrupted]--So, the suggestion was, if one went somewhere where it were less pressured, it might be a little easier to combine with being a single parent and just, in general, be easier. But it would be very difficult to participate in the kind of research that I do at MIT at a smaller institution; so I've never felt that that was a good choice to do.

Sherkow: You mean, like a women's college?

Kistiakowsky: Like at a women's college. there, you really have a heavy teaching load; you have very little time for research; and you're not in a position to get the funds for a real heavy research program. So I got stuck with my competitive institution and my competitive field.

Sherkow: How do you feel about working there now, after four years in that capacity?

Kistiakowsky: There are problems with any place, but I must say that I don't intend to leave or do something different. Last year, I explored, a little bit, the possibility of going into something like administration. But it was an exercise which convinced me that I wanted to say in experimental physics, at least for a while longer.

Sherkow: This year you are teaching at MIT and doing research?

Kistiakowsky: Yes.

Sherkow: What courses do you teach? I'd be interested in knowing your comments about the students that you teach at MIT as well.

Kistiakowsky: Well, the bulk of the teaching in the physics department at MIT is to be recitation instructors for the very large elementary courses. Every student at MIT has to take a year of physics in order to graduate. That means every single one of roughly a thousand freshmen.

Sherkow: No matter what your major is?

Kistiakowsky: That's right. One of the Institute requirements for graduation is a year of physics. Another requirement is a year of mathematics. Another one is half a year of chemistry or biology. Those are requirements put on everybody. It is an institution of science and technology: that's what it is; it's not a liberal arts college. You also have requirements in the humanities, but everybody has requirements in the humanities. MIT has, like a few other places, this requirement of science. This means that a large number of students go through the physics department in what are, basically,

service courses. So, a lot of the teaching effort goes into teaching those students. A fair fraction of the faculty do nothing but teach these recitation sections.

A fair fraction of my teaching has, in fact, been teaching recitation sections in 8.01, which is the first course in physics; 8.02, which is the second one; and 8.03, which is the third one, which everybody doesn't have to take, but which is still required for a lot of the engineering and science departments; so it's a lot more than physics majors taking it. I've also taught an introduction to quantum mechanics for non-physics majors, and I've taught an introduction to elementary particle physics for physics majors--both of those are undergraduate courses.

Sherkow: What are your feelings about the students that you've taught?

Kistiakowsky: MIT has a very high caliber of student. It really does. Occasionally you meet a really bright person, and it's a real pleasure. Until this spring, I would have probably committed the sexism of saying, "a very bright young man," but this spring, I have in my recitation sections a very bright young woman, who's a real pleasure to have there, because not only does she spot mistakes when you make them--which is good. Everybody makes mistakes, and if you have a student in the class who can catch you on them, it's enormously helpful. Usually it's a dumb mistake like multiplying by two when you should divide by two, or something like that--she also talks. We do have dialogues about the physics; so that's very nice. I've had others, as I say. Simply because the preponderance of the students are male, most of them have been young men. Occasionally you meet up with one of these really live-wire types, and it's a real pleasure. But even the average is very good.

Sherkow: This is the first time that you've ever had the rank of full professor, and I was wondering what this means, in terms of the rest of your career. Do you have future plans of perhaps some day going somewhere else?

Kistiakowsky: I feel that it is not useful to plan much more than five years ahead. For the next five years I intend to do the most interesting research that I can arrange to do; and that's what I want to do. I also have a commitment to the feminist movement, and, particularly, to helping women in science where I can. But if I look at it realistically, there are now so many people who are involved in this kind of thing that I may, in fact, be doing both the feminist movement and women in science more of a service if I just do a very good job of my own work, temporarily, and stop doing some of the things which I have done up to now. It would be sort of painful. I've enjoyed the sociology and social service kinds of things that I have been involved in. It's been very interesting and very broadening.

Sherkow: Well, you don't have to stop, completely.

Kistiakowsky: Well, no; I don't stop completely. I'm trying to do a lot less than I did before, because people who do high energy physics have an unfortunate tendency to really spend two hundred percent of their time on it. And if you're only spending fifty percent of your time on it, or eighty percent of your time on it, you look sort of queer in comparison.

Sherkow: Right.

Kistiakowsky: I meet people who say, "How many committees have you joined today?" or something like that. So it's partly the image that you project.

Sherkow: At what particular point in your career did you get married?

Kistiakowsky: Oh, I was a graduate student at Berkeley.

Sherkow: Were you in your first year or your second year?

Kistiakowsky: Let's see. It was June of '51; so it was the end of my third year.

Sherkow: But you hadn't received you Ph.D. yet?

Kistiakowsky: No. I got my Ph.D. half a year later, in January '52.

Sherkow: Did you ever feel that you had to choose between a marriage and a career?

Kistiakowsky: No.

Sherkow: You mentioned that you met your husband at International House.

Kistiakowsky: At I-House in Berkeley, yes.

Sherkow: Right. And he was coming to live there?

Kistiakowsky: As a graduate student, yes.

Sherkow: And you were already there?

Kistiakowsky: Yes.

Sherkow: And you started a budding romance by introducing yourself?

Kistiakowsky: That's right.

Wherkow: Along the lines of expectations, did you always expect that one day you would get married and have children and also have a career?

Kistiakowsky: I don't think I ever really thought it through that way. But certainly when I was at college, I found that there was an awful lot of peer pressure to the end that everybody should get married. The accepted young women were the ones who had an engagement ring or the ones who had dates or whatever. Not being in this group clearly made one less worthwhile.

Sherkow: Well, it's changed somewhat today.

Kistiakowsky: I'm sure it has. But there was just an awful lot of pressure. Then there was an awful lot of propaganda that you couldn't lead a happy life unless you got married and had children and the whole bit. I guess at some level, that this really penetrated. It never occurred to me that I would stop graduate work or not work after graduate school when I got married. As I say, this assumption on the part of my thesis advisor rather irritated me, even though at the time, it was a very low-level kind of irritation.

Sherkow: What were your parents' expectations? Did you feel that they felt that some day you would probably get married and have children?

Kistiakowsky: My father very clearly felt that if I got married, it would stop my career cold. He was not in favor of my getting married so young. It was not the particular person; it was the fact that I was getting married at that particular point.

Sherkow: How young were you?

Kistiakowsky: Oh, I guess I was twenty-two when we got married. But his feeling was that I should wait until I was established in my field, and then get married. Gerry's parents also felt that he was too young to marry, and similarly, that he should complete graduate work

and become established in his field. His parents liked me, and--my father didn't really know him because my father was on the east coast. But Gerry's parents lived in Berkeley, so I did get to know them. When my father met Gerry, there was no problem there. It wasn't a personal thing, but it was just a feeling that it was a mistake. So, it's quite the opposite of, I'm sure, what would have been common for most young women of that time, where the family were saying, "Why don't you get married and produce grandchildren right away?"

Sherkow: While you were at Brandeis, you had children. Right?

Kistiakowsky: Yes. My son was born the summer between leaving Columbia and starting at Brandeis. I actually didn't work that summer. Marc was born July 3rd, and I was moving in June. July and August I stayed home.

Sherkow: And then your daughter?

Kistiakowsky: My daughter was born June 16th, 1961. And again, I took that particular summer off; I didn't do any research that summer.

Sherkow: After the summer off, you went back to work?

Kistiakowsky: Yes. That's right. However, as I've said before, I was less effective at work than I had been before I had children. In retrospect, if I had been a little more prepared and a little more knowing, educated in how to deal with the situation, it could have been less of a disruption in my life. My husband was very supportive, in the sense that I should work at the same time as having children. He was one of the people who felt very strongly that I shouldn't stop

working. But, on the other hand, he was not a contributor to keeping the household going. I ended up feeling that the major share of the burden for doing so was placed on me. I found it irritating, as well as just difficult to deal with.

Sherkow: When your children were very young, did you have somebody that came in and helped you with the housework?

Kistiakowsky: Yes. When my son was born, my parents-in-law arranged to have a young woman come from Germany; she lived with us for two years, and she was just wonderful. She was intelligent, responsible, nice, just fantastic. I was spoiled for all time to come. Then, she left at the end of the two years. She stayed in this country, and, subsequently, she married somebody who was a graduate student at MIT, and she's now the wife of a professor at MIT. [Laughter]

Sherkow: Interesting progression.

Kistiakowsky: Yes. But her successor, who was sent to join us from Germany, again by her family, turned out to be a total disaster. It turned out that she was sent because her family wanted to separate her from her boyfriend, which, of course, is a dandy reason for sending somebody to take care of kids on the other side of the Atlantic. That didn't work, and it didn't work in a very major fashion. So I took my losses financially and just sent her home.

Then I went through a series of arrangements with local people, which was a very trying year; it really truly was. That was the year after Karen was born, and it was very difficult not to have an arrangement which I could feel happy about. Finally I did find somebody who clearly I felt happy about, and she was very honorable; she said

she had been married and she wanted a job to earn some money, but that she was trying to get pregnant, and I should know that when I hired her. However, she hadn't just been married; she had been married a year, but she hadn't succeeded in getting pregnant yet, and she wanted to work until she did. Of course, taking my job was exactly the fertility medicine she needed, because she immediately became pregnant. However, she was with us for six months anyway, and in that time we made arrangements for somebody else to come from Europe. That person stayed with us for a year and a half and was quite good. By that time we had moved from Newton into Cambridge because my husband was very unhappy at living in Newton and commuting to Cambridge. When I took the job at MIT, there was no advantage to live in Newton, so we moved.

Sherkow: Did you move to this house? [On Upland Road]

Kistiakowsky: No, it was to a different address, 6 Maple Avenue. It's closer to MIT. And, let's see, what happened then? Again there were a series of people who did not live with us, who lived locally. The first one was the wife of a student at the business school. Then there was a young English woman whose husband was visiting was a professor somewhere, who wanted a job. Then there was a local woman who took care of the children for a year and a half.

Sherkow: So, while they were growing up, you always had outside help?

Kistiakowsky: I always had somebody there full-time. Right. Otherwise I couldn't have worked.

Sherkow: I see. That's what I was trying to get at. Usually this person lived in your house?

Kistiakowsky: Sort of forty percent of the time out, sixty percent of the time in.

Sherkow: You mentioned that your husband put the burden of the household activities onto you. But, did both of you find time to spend with your children as they were growing up? I mean, you weren't involved in all the domestic chores, but I assume you both found time--because you both had full-time careers--to spend with them.

Kistiakowsky: Well, there again, I spent considerably more time with them than he did. When I say burdens, I don't mean washing the floor or anything like that. I mean making the decisions, seeing the children got to the pediatrician; if the person who was supposed to take care of them was sick, then I stayed home with them. It was my responsibility, and I had to see that the thing ran. Even if it didn't involve a very large amount of work, it still existed there as a burden of responsibility for me. Anyway, enough said.

Sherkow: Is there something else you'd like to say?

Kistiakowsky: No no. I think I've said it straightforward.

Sherkow: Okay.

Kistiakowsky: When you have somebody doing the work for you, they don't do all of it. I mean, it is a fact that when you have a mother who does the work in a house, she really does an awful lot of work. When you replace the mother, if you're really going to replace her, you don't just replace her by somebody who takes care of the children. You replace her by somebody who takes care of the children, somebody who

does the cleaning, somebody who does the chauffeuring, somebody who does the shopping and the organizing, and the whole bit.

Sherkow: So you still did a lot?

Kistiakowsky: In fact, I did do some fraction of the work; not nearly as much as I would have if I hadn't had help. But, my main investment of money has always been in people who would take care of the children. So that was always the thrust of those arrangements. If I got additional work out of it, that was fine and good. But, that was the primary emphasis there. If the people didn't do additional work, then I did what they didn't do.

Sherkow: Okay. In 1970 you were divorced from your husband.

Kistiakowsky: Yes. Well, we actually separated a long time before that. 1965 is when we separated.

Sherkow: Oh, you mean you weren't living together then?

Kistiakowsky: That's right. In the summer of 1965 we decided to separate; after we reached that decision, he took a job at the Stanford Linear Accelerator Center in California and, in September of that year, he left the Boston area and went to California.

Sherkow: And the children stayed with you?

Kistiakowsky: Yes.

Sherkow: Right. Do your children still see their father?

Kistiakowsky: Oh yes. They've gone and visited Gerry almost every summer for a month. After the initial turmoil, it's a very amicable

He recently remarried.

Sherkow: Does he still work out in California?

Kistiakowsky: Yes, he still works at the Stanford Linear Accelerator Center.

Sherkow: And he's a nuclear physicist also? High energy?

Kistiakowsky: He's also a high energy type at this point.

Sherkow: Okay. You mentioned that you took off two summers while you were pregnant.

Kistiakowsky: Yes.

Sherkow: But did your pregnancies affect your work in any way?

Kistiakowsky: No.

Sherkow: Did you have to work part-time or anything like that?

Kistiakowsky: No no. No. As a matter of fact, at Columbia it was a matter of pride with me that I didn't have to wear maternity clothes until I was eight months pregnant.

Sherkow: Really?

Kistiakowsky: Yes. The second time around, it wasn't like that though. The second time around, my muscles had been stretched. But the first time around, I was able to stay out of maternity clothes until quite far along.

Sherkow: I was wondering what you thought of an idea that Helen Astin wrote about in Women Doctorates in the United States. [The Woman

Doctorate in America: Origins, Career, and Family] She really felt that professional women or working women should be able to have new tax laws, where they were able to deduct expenses of any domestic help that they hired. I was just wondering what you thought about that particular idea.

Kistiakowsky: Speaking from my point of view, it sounds eminently reasonable. You can't work unless you have this kind of help. Domestic help--there, I'm not so sure. You can, in fact, come home and do the laundry and all that stuff. It makes you less competitive than the person who has all his or her time to spend on their job. But, maybe that should be a matter of choice. However, I think the child care is a very legitimate thing to be an income tax deduction, and I would be very much in favor of a law that just made all child care expenses deductible.

Sherkow: Right.

Kistiakowsky: I don't know. The other is fine, too, but it seems a little bit piggy.

Sherkow: I think that's what she meant by it--really the child care. I was wondering also, at what point did you stop hiring help?

Kistiakowsky: Well, this year is the first year that I haven't paid somebody to be responsible for my children. Since I moved into this house in '65--that isn't quite true; not the first year, but for the other years--I have let the third floor apartment to a couple, a young couple, in exchange for taking care of my children. At first it was real child care. I mean, it was always a young woman, and in

each case, she had a small child of her own; she was responsible for taking care of my kids after school and when I was out of town and whatever, or when they were sick. At that time, I also paid a salary, as well as giving the apartment. It's a nice arrangement; it's quite a substantial apartment. It's a four-room apartment.

Sherkow: So this is the first year that you haven't done this?

Kistiakowsky: Gradually I paid less salary, because simply of the amount of time that was involved in doing this. Last spring Mark and Karen decided that they really, truly were old enough so they didn't need anybody to look after them; so this year is the first time that there has been no arrangement. However, the young woman who lives up there is the person who used to take care of them, and she's now paying us a small rent for the apartment. She's a very nice person, and it has been a real feeling of security to know she's there when I go out of town. Next year, when we'll be out in Concord, is the first time when we'll really be in a house, completely without anybody.

Sherkow: Just the three of you?

Kistiakowsky: Just the three of us.

Sherkow: Right. You're moving next week, right?

Kistiakowsky: I'm moving on Friday of this week. [May 14, 1976]

Sherkow: Right. This week? To Concord?

Kistiakowsky: Yes. Tomorrow the packers come.

Sherkow: So, from then on, you won't have any help?

Kistiakowsky: That's right.

Sherkow: What are the ages of your children?

Kistiakowsky: Marc is sixteen, going on seventeen, and Karen is fourteen, going on fifteen. He will be a senior in high school next year, and she'll be a sophomore in high school next year.

Sherkow: Do they both go to private schools?

Kistiakowsky: Yes. They always have.

Sherkow: What schools do they go to?

Kistiakowsky: Currently Marc goes to the Cambridge School of Weston, and Karen goes to Concord Academy, which is why we're moving out to Concord. He's old enough so he can drive.

Sherkow: Oh, that's nice.

Kistiakowsky: Oh! If you knew the insurance rates on teenage males... [Laughter]

Sherkow: Is that his car out there, that little sports car?

Kistiakowsky: Yes. He's getting it into working shape.

Sherkow: I was wondering if you could describe a typical day for me?

Kistiakowsky: It doesn't exist.

Sherkow: That's what I thought.

Kistiakowsky: Yes. Well, a day that's typical of many of them is that I wake up between five-thirty and six. I get up, I come downstairs, I have some coffee, I read the newspaper, and I may read one of the

journals. Karen joins me for a bite of breakfast, and then she goes off to school. Marc, this five-week period, is in Germany on an exchange program between his school and a German school. If he were here, I would go upstairs and say, "Hey Marc, you're not going to get to school on time unless you get up." Then he would get off to school, and then I usually leave the house shortly after seven, go to MIT because if I go that early, I have a blissful hour, hour and a half of undisturbed work, before people come in. Then if I have a class in the morning, I prepare for class, teach the class. If I have a class in the afternoon, I can get some research done and then go to class. Most of my research is computational; it's data analysis when I'm at MIT, so that alternates with things like writing papers and administrative details and what have you. Then I come home, leaving MIT between five-thirty and six. Either I cook dinner or Marc or Karen cooks dinner. And, depending on whether I have something to do in the evening or not, I may bring work home with me, or I might go to a meeting of one of the children's school or something like that.

END OF SESSION II

MIT ORAL HISTORY PROGRAM

Program on Women as Scientists and Engineers

Interview with Vera Kistiakowsky by Shirlee Sherkow

Concord, Mass. May 26, 1976

Session 3 Transcribed by Johanna Kovitz

Sherkow: Today is May 26th, and I'm Shirlee Sherkow, and this is the third session with Vera Kistiakowsky. Last time we ended with a discussion of your various jobs, and I wanted to ask you what was it like at Berkeley as a graduate student during the McCarthy era?

Kistiakowsky: Well, since I knew Oppenheimer in Los Alamos--not personally, but as the daughter of a colleague of his--and since my father felt very strongly and positively about Oppenheimer, I had rather strong opinions about what was going on with respect to Oppenheimer, in particular. The rest of the impact of the McCarthy era was not so immediate. I didn't know the people who were being asked to take the loyalty oath and leaving. I did know what was happening, but it didn't have such a strong impact. As a matter of fact, my post-doc work at Berkeley was done with the Alvarez group, and the attacks on Oppenheimer made that year not as easy as it might have been: in a sense, I was very grateful to Alvarez for the opportunity to have a post-doc in his group, but I also felt rather strongly that what was being done to Oppenheimer was very wrong, and I couldn't summon up the normal kind of friendly enthusiasm for my research sponsor that one might want to, under those circumstances.

Sherkow: Was Alvarez...

Kistiakowsky: He's one of the people who testified against Oppenheimer. His testimony was voluntary. He was not a reluctant person; he was a positive agent in this.

Sherkow: But at the university, were there any professors that had to leave?

Kistiakowsky: Oh yes. There were people who left. There were people who were asked to leave, and there were people who left because they did not like the climate of the times. Berkeley was split between people like Lawrence and Alvarez, who were very conservative and security-minded, and people like Panofsky, who felt that this was very wrong; who left.

Sherkow: Okay. I was wondering if your career ever conflicted with your husband's career. I didn't ask that before.

Kistiakowsky: No. The one time that it looked as though there might be a conflict, it really wasn't a conflict between my career and his career. It was a conflict between my career and our marriage. It was resolved in favor of the marriage. That was when he left Columbia to go to the Cambridge Electron Accelerator, and I had the option of staying at Columbia, and I didn't. In retrospect, it turned out all right. But in fact, that was the only time there was that kind of conflict.

Sherkow: Do you think you would have made the same decision now, feeling the way you did then?

Kistiakowsky: I felt very strongly then, and I probably would not

have moved if I hadn't been expecting my first child, and hadn't had all kinds of people lean on me.

Sherkow: I was wondering if your divorce affected your career in any way?

Kistiakowsky: No. Not really. Actually what you should ask is whether the separation affected the career, because the divorce came many years later and was just sort of a recognition of an accomplished fact. No. The separation was a recognition of an existing situation in the marriage, and about the only effect that it had was that I had a few more responsibilities at home, but also considerably more freedom of decision, if you like.

Sherkow: Okay. I was wondering if there was a special problem in physics--in returning to the field after taking off time to have children.

Kistiakowsky: Well, I think if I'd really taken off the time solidly, there might have been. But since I only took off bits and pieces, and continued teaching and did reading throughout the whole period--and actually, I was only out of research completely for something like a year, from the time I left Columbia until the beginning of the following summer. But even during that time, I was going to seminars; I was doing reading; it wasn't as though I were staying home.

Sherkow: Right. Well, in general, then, is it more difficult for a woman to return to the particular field of physics, as opposed to other fields, if she takes off more than a year?

Kistiakowsky: Any field of physics. (except a field which is not very competitive; namely, some field which is enough out of the mainstream

so that it doesn't involve very many people) is, just by the nature of a competitive field, going to make it difficult for somebody to participate in it on less than a full-commitment basis. A few young women I know are doing things like taking jobs as scientific editors and writing review articles and things like that, as a way of staying in the field in a position where they can be in contact with all the recent physics, but where they don't have this really direct pressure to compete.

Sherkow: That question, I had taken from this article (I don't know if you'd ever seen it) in Physics Today. [April 1971, p.23, "Women in Physics" by Gloria B. Lubkin]

Kistiakowsky: Yes.

Sherkow: Right. Betsy Ancker-Johnson mentioned in here that in order to achieve as much as a man, a woman in physics would have to be twice as determined as a man with the same competence level. I was wondering, what do you think about that?

Kistiakowsky: I think she's right. There are two sides to that. There's what you might call the practical side. I mean, if a woman doesn't marry, or if a woman marries a husband who believes in total equality in a marriage and there are no children, or if there are children, there is enough money so that a really adequate child care arrangement can be made, and the sharing of responsibility by both husband and wife, then probably there won't be practical problems for that particular person with respect to a career in physics. But if there's any hint of a traditional marriage, where the responsibilities are much more on the wife's shoulder, of if there isn't enough money to really have a reasonable child support system, then there are very

severe practical problems. And you can't just walk out the front door and say to a small child, "Good-bye, I've got better things to do." So that's one side of it.

The other side of it is that whether you call it discrimination or not, there are different attitudes towards women, and they vary in intensity, depending on where you work--from being very minor and really not much of a hindrance to a career, to being rather major and being a considerable hindrance to a career. For example, Betsy Ancker-Johnson at one time worked at a place where she was not allowed to work from the time she was, I guess, seven months pregnant until a few months after the baby was born. That meant, not only was she not allowed to go to work, she was not even allowed to use the library. She was not allowed in the building because of their insurance and their company policies. That clearly poses a problem on a scientist, because if a man, say, has an ulcer or a hernia operation or something like that, he at least is allowed to go in and use the library.

Sherkow: Well, that was one of the things that she had mentioned--the prejudices all along the say. Without spelling them out, that's what she said. And that a woman had to have unusually strong motivation to just continue and be a physicist, and even after that, during the whole job sequence. So, do you feel that that's true too? You've mentioned the practical aspect of the marriage and the problems with that.

Kistiakowsky: It really depends on where you are, and it depends on whom you work with. I mean, there are people who really and truly are willing to treat you as a physicist, irrespective of what your sex is. And I've even met a few people who were enthusiastic about having a woman

physicist around, and therefore were willing to give you a slight plus. I've also met a lot of people who were unenthusiastic about women in physics, and gave you a considerable minus. So the time average of the whole thing was negative, but in a given time, with a given group of people, it can vary quite a good deal.

I've never had the problem that some people have had. I mean, Maria Mayer could not get a paying job for years and years and years. She worked without a salary. I've always been able to get a job that not only paid me, but also allowed me to do the research that I wanted to do.

Sherkow: She was older though.

Kistiakowsky: Yes. She started twenty years before I did.

Sherkow: Did you personally ever have any problems with nepotism rules?

Kistiakowsky: Yes. When I was a graduate student at Berkeley and Gerry and I got married, he could not get a research assistantship because I had one. Berkeley, in fact, had a nepotism rule. And one of the reasons I went to work for Hunter's Point U.S. Naval Radiological Defense Laboratory was because as soon as I did, he could get a research assistant's support. At Columbia there was no problem, and that was the last time we worked in the same place.

Sherkow: There are still places today where those kinds of nepotism rules exist, aren't there?

Kistiakowsky: Well, strictly speaking, I think they are illegal, so

it tends to be disguised. What usually happens is, places say they have conflict of interest rules, which means that if a wife has a job in the department, the husband can't be department chairman or vice versa. But I think it is illegal to have an old-fashioned kind of nepotism rule.

Sherkow: I wanted to ask you about the small numbers and percentages of women in physics. Do you know why this is? I mean, of all the fields, physics and engineering have the smallest percentages.

Kistiakowsky: Well, I really think it's because of the image they have in the country of being male fields. I hate to keep saying Soviet Union, but in fact, in the Soviet Union there is the propaganda that all fields are open to women equally with men, and you do have much larger percentages going into both engineering and physics. The fact remains that the percentages in those fields, of women, are not fifty percent; it's less than fifty percent. One-third of all the engineers are women, and depending on what degree level you're at, anywhere from fifty percent to ten percent of all physicists are women. It's fifty percent at the very lowest levels, and it drops to one percent at the very highest level, the Academicians. Ten percent is still very much better than it is in this country, but there's the question of why there is this sharp drop. The reason is that in physics, it is a very competitive field, and you get to the top by devoting a very major fraction of your time and effort to succeeding. And if you have something else in your life, like a marriage to support, or children to take care of, or a house to take care of, it's just much harder to compete. And I think young women look at what the picture of a physicist is, and it's

a person who's devoted to science, and this looks pretty cold and inhuman. When you start talking about sixty- or eighty-hour weeks, then the question raises its head: where does the time for my private life and my family come into it? And it's discouraging.

Sherkow: Do you spend sixty to eighty hours a week?

Kistiakowsky: When I'm working hard, the answer is yes. Eighty hours, not any more; no. Since my children have been born except when we're at a [high energy] accelerator and running--I don't do that anymore. But, you know, it certainly isn't a standard work week, because I bring work home with me. It's essentially a job where you work until you get things done, and there are always more things to do than you have time to do. So it's sort of an endless source of work.

Sherkow: How do you feel about the competitive nature of your work?

Kistiakowsky: Well, I think basically I am fairly competitive, so it hasn't bothered me until recently. Recently, when the money for science has decreased rather markedly, the competition has ceased to really be scientific competition and has political overtones that are rather unpleasant. And I must say, it just bothers me, not from a practical standpoint, but just from a human standpoint, that one has to succeed at somebody else's expense. In a very real fashion, no longer one does the experiment and gets the credit and that's the scientific thing. But now one succeeds and gets the money, and somebody else doesn't.

Sherkow: I was wondering if you could comment on the type of work that the women engineers and physicists in the U.S.S.R. do there. Is it on the same level as what the women do here? Are there any kind of differences?

Kistiakowsky: Well, all I know is what I've read, and therefore it's not any new information. The women engineers in the U.S.S.R. are distributed somewhat differently than the men. They tend to be less in the heavy engineering jobs, you know, the construction type thing. But there still are women in much larger percentages in all branches of engineering. I mean there are women who head up dam projects, all this kind of thing. There is a woman engineer who is the head of the station in Antarctica, and all kinds of examples. But basically, they do tend to be in more the office design work than the more heavy engineering work. At least that's what the books say on the subject.

In physics that isn't true. They tend to be distributed. There, the difference is that if you look at the academicians and the highly placed professors, the heads of scientific institutes, the percentage of women is dramatically small. If you look at the lowest level, you find that about fifty percent of the people are, in fact, women. But when one says "physicist", it's not really quite what one means in this country: they're more at the level of scientific technicians.

Sherkow: I see. So there is a problem there.

Kistiakowsky: There is a problem there, and it depends to whom one talks on what the reason is that one is given for this difference. The reason I have given you that there is a sort of a dual role for the women there--is the one that most books come up with, both Soviet books and books written by people in this country. Because life there is a lot harder than in the United States. I mean, it's much more difficult and time-consuming to run a house and feed a family and clothe a family than it is here.

Sherkow: Well, you were over there for awhile?

Kistiakowsky: Three months, yes.

Sherkow: Were you working with any women physicists?

Kistiakowsky: Yes. There was a young woman physicist in the group in which I worked, and she was having essentially, I guess, what you'd call an emotional crisis: whether she should pursue her graduate work in the physical institute in Erevan, or whether she should go back to Moscow, where her boyfriend was. And, you know, it was a strictly American romantic novel type crisis. I left before the crisis got resolved, but it was a real one, as far as she was concerned. But I also met a young scientific couple where the wife works in one physical institute, the husband works in another physical institute, their children are cared for by the wife's parents in a completely different location, and they seemed very happy and relaxed about the whole thing.

Sherkow: Three months isn't a very long time. Most of your work seems to be done with teams, and looking at the articles that you have written, fairly predominantly male teams. I was wondering how you feel about that? Any comment.

Kistiakowsky: All my life I've been working mainly with men. As a matter of fact, right now I have the very pleasant situation of having two women colleagues on the big experiment in which we're involved: Professor Widgoff at Brown, and an instructor, Elizabeth Hafen, at MIT.

Sherkow: Is that an unusual circumstance?

Kistiakowsky: Yes, it is. Well, no, I take it back. When we did experiments with Harvard, Margaret Law was one of our collaborators. But I haven't worked with very many women. There just aren't very many women physicists.

Sherkow: Does that bother you at all? Or is it bad, good?

Kistiakowsky: I didn't used to think about it, one way of another. Since I have become actively concerned about the participation of women in science, I must say I enjoy having a woman colleague to talk to. One of the things I have found about women physicists is that they are surprisingly open and willing to talk about being a woman in physics, and, by and large, pretty feminist. Even if they're not active feminists or anything, their points of views are--in surprising number--feminist. I've only really met up with two women who were outspokenly unwilling to consider that there was any problem for women physicists.

Sherkow: Do you think that has any relationship to their training?

Kistiakowsky: It may have something to do with the kind of people who go into physics, because certianly I have met up with women mathematicians--well, I don't know that many women mathematicians, but given the small number I know, a very large percentage of them are, in fact, either neutral or anti-feminist. And chemists--well, there I don't know. There I would say probably I've met more neutral people than in the case of physicists, but I've also met some very strong feminists among the women chemists, or at least very sympathetic.

Sherkow: You don't know why this might be?

Kistiakowsky: I could make guesses. I could make guesses that something like mathematics or very abstact theoretical physics might attract a certain frame of mind that wouldn't relate to what you might call practical problems. On the other hand, the women mathematicians, in my opinion, are the ones who are most discriminated against. So it's surprising.

Sherkow: I was wondering if you would comment on [Matina] Horner's idea of women being fearful of success. There was an article in the Globe about a week ago, about how she felt her theory was still true. I was wondering if you would comment on her idea.

Kistiakowsky: If you read her paper, her publications, you realize that she's done a careful study and that she is careful to state what it was that she did and why she draws the conclusions she does. It looks as though she really has turned up something there. Now, I have never done a study like that. All I have is the impressions that I've gotten, and I have run into a number of women throughout my life who essentially said, "You must be careful not to look as though you're competing with men because then they won't think that you're attractive or a proper woman." You just have to read articles in Good Housekeeping and those kinds of magazines, and you realize that this has been a theme all along: that the woman should not act as though she were intelligent or capable; she should manage from behind--you know, the power behind the throne, but always disguising it so the man doesn't realize what's going on. It really makes him look like pretty much of a dumb cluck, I must say. And most of the men I know are too smart to have anything like that going on in their lives. It's always rather suprised me that this was considered reasonable advice.

But, in any case, if you grow up with that kind of thing, and particularly, I suppose, if you grow up with a mother whom you can observe to be intelligent, who never uses her intelligence in any overt way but only uses it from behind, you, I'm sure, would get the message very quickly. And the young women even today do have a certain uncertainty--a certain schizophrenia about what they want to do. And there is a real root; there is an honest-to-God practical root in this. If you have a traditional marriage and you are a traditional wife and a traditional mother, it is not compatible with also being very ambitious, achieving career woman. Forget about physics; any kind of a career. In order to be ambitious and achieving as a career woman, you also have to have a marriage which is built on this as a foundation so that it doesn't pull the marriage apart but brings the marriage together. And that takes as the other half of the marriage a young man who views things in that light. You saw that cartoon in my office, didn't you? A young man who's standing in the business office and who says to his boss, "I'm sorry but my wife's firm has just moved her to"--I guess it's Topeka or somplace like that, and I guess he's telling his boss that he's going to quit because his wife's firm has moved her. I like that cartoon, not because of the reverse whammy, but because of the germ of truth that's contained in it. I mean, both sides of the marriage have to be willing to do that at some point, when that is right for the marriage as a whole, and that's very hard.

Sherkow: I really don't like this particular thing that seems so ridiculous--this value system or whatever you want to call it. I really feel that a lot of the burden is on the part of men, who really can't share the responsibilities of the world with women. I feel that there is

a power situation going on: the men sort of fall back onto the status quo and say "Let's just leave it the way it is. We really don't want to give it up to women, and they really should stay at home." And there just seems to be this huge fight; it's ridiculous, and it's very upsetting. I just feel that hundreds of years from now they'll look back and they'll say, "Weren't they just ridiculous back then? "I mean, that that situation ever even existed.

Kistiakowsky: Well, I hope you're right. A hundred years from now they may look back and say, "Gee, what were all those crazy women doing during those times?" There's unfortunately some five thousand years of varying degrees of non-participation of women in anything except the home, and we may be on the threshold of a brave new era, and we may not. I think we are, but...

Sherkow: I just don't think women are going to put up with it. That's my personal opinion, but we're not interviewing me. As education gets better and better, as it always has, I just don't think girls are going to just sit back and say, "Well, this is what I want to do." I mean, in terms of sports and other things, girls have really come far; they want to play baseball.

Kistiakowsky: Sure.

Sherkow: I think maybe the younger that you are, and the more you become aware of it, the more unwilling you are to just go along with it. It's kind of different for us. I mean, I wasn't a feminist until I was out of college, and then that's different. Suddenly you wonder what happened: where were you?

Kistiakowsky: That's right.

Sherkow: But you were just a product of your society.

Kistiakowsky: Yes.

Sherkow: You just didn't really know; you just went along with what everybody told you. I just feel that girls today are different.

Kistiakowsky: Yes, but I look at my daughter and her friends, and they are different, but it's not clear that they are not different. I don't know. I mean, I know some young women at MIT who, in a sense, are very different but in a sense aren't that different. They're just supremely confident: "I'm smart, and I'm at the best institution in the country." But you know, there are a lot of good institutions in the United States, and MIT is one of the best. They just feel very self-confident, and dissociate themselves, basically, from women as a whole. And in doing that, they're making a mistake. I can say that from profound personal experience, having gone that route myself. Perhaps the most comforting thing about coming on feminism was the discovery that I wasn't different. I mean, I may be somewhat unusual in the field I chose, but I'm not really that different, if different at all, from other people.

Sherkow: I wonder too, about a backlash type of thing. I was in college in the sixties; I was in the class of '69, and Time magazine called that the "revolutionary class." The classes after me really rejected, kind of, that revolutionary aspect, or what I think of as just standing up and wanting to be counted as a person, not just as a student which is not as an equal; they were just sort of meek.

Kistiakowsky: Yes. Well, '69, you're right. That's exactly right.

Yes. But they are not the same as the people who came in the really early sixties.

Sherkow: How are they different?

Kistiakowsky: They have a much greater sense of their own personal worth. They are willing to talk back to professors. They are willing to raise a fuss if they think something is wrong. It's just that they don't raise a fuss about global issues or about moral issues. They raise a fuss about personal issues, which is sort of a shame. I hate to see the idealism disappear. But there is a much greater conviction, as I said, of individual worth to the particular individual. My son certainly considers himself a full form person. I mean, when I was his age, not quite seventeen, in certain senses I thought I was an adult, but not in the way that he does, by any matter of means. And I don't think it's a male-female difference, because I think my daughter will be the same way. To some extent it's sort of a shame; it's making people grow up early.

Sherkow: What's making them grow up early?

Kistiakowsky: Well, the whole culture which does, in fact, tend to have parents abrogate control to a certain extent. I haven't done it to the extent that some people do it, but I certainly give my children much more say in what happens to them than my parents gave me in what happened to me. And in both of their schools they have a much greater degree of decision-making power than I did when I went to school.

Sherkow: And you think it's a shame, to a certain extent?

Kistiakowsky: Yes, because I think it also imposes a burden. It removes a certain carefree aspect from being a child and a young adult. When I was that age, I was having a wonderful time at Los Alamos with my horse; I'm not sure whether that's completely the right thing for a person that age to do, but on the other hand, I don't think somebody that age really should take the weight of the world on their shoulders, nor even some small subset of that.

Sherkow: Okay. In one of your articles, "Women. Doctoral Scientists in the United States, [(1973)]" you talked about collegial interactions as something that's kind of important for all future scientists to have. I was wondering, in your own personal career, how has this worked into it? Did you have that?

Kistiakowsky: I think I've had much less of it than I would have if I had been a man. There certainly is a certain--I don't know what you call it, I guess collegial interaction is the best way to describe it. You're not just saying, "Hey, come on, let's go have lunch;" that kind of thing, or getting invited to go out with the seminar speaker is perhaps the most frequently quoted example. It isn't necessarily being a woman. I mean, if you were different in other respects, you might also not have as much of that kind of interaction. But I think that a woman does, in general, suffer in that, because she doesn't look like the kind of person that you invite to come along.

Sherkow: She doesn't <u>look</u> like the type of person?

Kistiakowsky: Yes, sure. She's a woman. She's not a man.

Sherkow: So it has been a problem. Did it hinder or upset you in any way?

Kistiakowsky: Occasionally it irritates me when there's a visitor with whom I would like to have a chance to have a conversation, and I don't have the chance to have a conversation because I'm not included in the group. But I must say that happens very infrequently, and I don't know how much of a hindrance it is; it's very hard to evaluate. The feminist articles on this usually say that this is where all the new ideas get discussed, and this is where the hints get passed on about how to succeed. I don't think that's really true. Possibly the place where it's worst is when one goes to a conference, and there, if one doesn't have an easy speaking relationship with people, then, in fact, one doesn't get to pass on information and have information passed on to one. I guess that's the one place where it has been a hindrance where I'm concerned. I think part of it is being a woman, and part of it is having developed social graces very late in life. There are some women who are very good at social graces, and they do very well at conferences and so on. But having a dual handicap sort of made that difficult.

Sherkow: There's also been mention of what has been termed the "buddy system:" as you're going through graduate school if you have close relationships with certain professors, then when you finish, jobs are more accessible to you through that relationship.

Kistiakowsky: That's right.

Sherkow: And they make mention of the fact that women tend to not have that kind of support.

Kistiakowsky: Well, certainly in my case, as I mentioned, my doctor-father (thesis advisor) viewed me as somebody who was married and would

shortly remove herself from the scientific scene to do what was important in life, namely, having a family. And he did not view me as somebody for whom he should make any real efforts to get a job. That certainly was true of the other woman who got her thesis with him. Now, Professor Chien-Shiung Wu has had a buddy system with her female students, and she makes the same effort to get them jobs that she makes to get her male students jobs. And, in fact, a couple of her female students have done very well because they had ability and because she supported them strongly. And I've known some other women who've gotten very strong support and who've done well. But I think in general that's an accurate statement: they aren't viewed as people who are likely to be successful, and therefore the thesis advisor is not willing to extend himself in getting them a job.

Sherkow: You also mentioned the barrier of invisibility, and you had mentioned the example of Rosalind Franklin and her work in the DNA projects. I was wondering if you could comment on that. It just seems so preposterous to me after having read quite a lot of the book on her.

Kistiakowsky: That Ann Sayre book?

Sherkow: Right. That's the one. Feeling really terrible that that could even have happened, and that they had Nobel Prizes and everything, and she wasn't recognized.--[interview interrupted]--

Kistiakowsky: Yes. Well, whether a person gets recognized, man or woman, depends, first of all, on whether they have published their results, but second of all, also, on what their colleagues feel was the background to getting those results. Rosalind Franklin is an example of where she did not publish in advance of the other people, and the

other people made an effort to claim all the credit for themselves. The people immediately around her did not support her, and therefore her contributions were rendered invisible.

We have another example. Jocelyn Bell was a graduate student with [Antony] Heusch, and she made the first observations of a pulsar when she was his graduate student; he took the claim and won the Nobel Prize, and she did not get a share of it. She's now an astrophysicist in Britain, and she says, "Well, it's not so unfair." In fact, she did discover it, but she was his graduate student. He was the person who was running the group, and usually the professor in a situation like that does get the fame and not the graduate student.

It's not confined to women. For example, the discovery of the anti-proton was done by [Owen] Chamberlain, [Emilio] Segrè, and Tom Ypsilantis. Ypsilantis was a graduate student; Owen Chamberlain and Emilio Segrè got the Nobel Prize; Ypsilantis did not. You know, the Bell case is special. I guess I'm sort of wandering a little bit. The point is that there are other examples of invisibility. It just tends to afflict women more than it does men. And it may be because women very frequently are in positions where they depend on the people with whom they work for visibility. Now, a very good example of good surroundings is Maria Mayer, who was working at the laboratory at Chicago headed by Fermi. He made every effort to give her visibility, and she got the recognition for the work she did and won a Nobel Prize. Now, snide people these days say, "Oh well, it must have been Fermi's idea," because she was working there. But I'm not sure whether that's because she's a woman or because they assume that anything that came out of that institute was basically his idea.

BEGIN SIDE TWO

Sherkow: You've been involved in a number of different research projects, and I was wondering if you could briefly discuss each project and the work that you've done in them.

Kistiakowsky: Yes. Well, how far back do you want me to go? From time zero?

Sherkow: I guess from the point of post-graduate jobs.

Kistiakowsky: Okay. Well, I did my thesis on the isotopes of promethium, and one of the isotopes of promethium, promethium-150, was particularly interesting--[interview interrupted]--One of the isotopes, promethium-150 was readily accessible to radioactive decay study. So while I was at Hunter's Point Naval Radiological Laboratory, I, on my own time, came back to Berkeley and made some of this radioactive isotope, using the cyclotron at Berkeley, and used some equipment I had there to study its decay properties. So that was sort of the first piece of postdoctoral research I did, to really run that into the ground. A new research tool had become available, namely, the use of sodium iodide crystals to do gamma ray spectroscopy, and that was one of the things that made that particular experiment possible.

And then the second thing that I did was the year that I had the fellowship and worked as an adjunct of the Alvarez group at the rad lab, was a study of short-lived rare earth isotopes. And those I produced by bombarding rare earths at the linear accelerator with the protons they had there. These were really very short-lived, so I had a slide mechanism that held a target of rare earths, and these were oxides of rare earth elements, so they were powders, and were held in a little

plastic envelope in the way of the protons. At the end of a short period of time, I released the slide, and the whole thing would drop down in front of my detectors, and then I would record what the counting rate was as a function of time. That way I found a number of short-lived, from tens of seconds to a minute or two in half-life, isotopes.

Sherkow: These are new discoveries?

Kistiakowsky: Yes. Not earth-shaking, but they are new discoveries. Then when I went to Columbia, the first year where I was working for Dr. Wu, I did some more radioactive studies. Actually, one of them in collaboration with a young man who was working in the laboratory there and not with her. But when I started my own work, I built a scattering chamber and took it out to Brookhaven National Laboratory where I did nuclear interaction studies, observing the particles that came out of the nuclear interaction with a proportional counter and a sodium iodide crystal, instead of doing radioactive studies.

Sherkow: Why did you switch from radioactive studies?

Kistiakowsky: Because going to the nuclear interactions essentially gave you a different kind of tool to look at the nuclear forces. It was going to a higher energy, and it was enabling you to look at, if you like, higher states of the nuclei. But another way of saying it was--I think, that's perhaps a little better--is that it was giving you a somewhat finer resolution device to study the nuclear force with. You know, all my life has sort of been a climb in energy of the research that I do. That was what I did while I was at Columbia.

When I came to Brandeis, the first year I did not do research. I did a bit of looking around and thinking about what I might do, but

there weren't any readily accessible [high energy] accelerators for nuclear research. And in any case, my feeling was that some of the most interesting experiments were really in the quite high-energy region, so I switched from nuclear physics to high-energy particle physics and joined the bubble chamber group, which at that time consisted of a contingent from MIT, a contingent from Harvard, a contingent from Brown, and I think there was an Italian collaboration in that also, if I'm not wrong. I'm not sure, but I think so.

Sherkow: How do you make the switch?

Kistiakowsky: Well, I had been going to seminars all along on particle physics, because that really was, in a certain sense, the forefront physics. The most exciting new things were happening there, so I knew what was going on. And the practical reason for making the switch was that one of the people at Brandeis was working in a rather peripheral fashion with this group, and the easiest thing was to join up with him, in collaborating with them. Once I started working with the group, it was very straightforward to continue with it. They were doing some very interesting physics; there was every reason to continue working with them.

Sherkow: It's a large group of people?

Kistiakowsky: Well, it's varied form time to time. It's not been a constant. The first experiment that I participated in was a study of lambda K-zero in a bubble chamber at Brookhaven National Laboratory. This was not a bubble chamber filled with liquid hydrogen; it was a bubble chamber filled with propane and methyl iodide, so that one could see conversions of photons into electron pairs. Photons come from

pi-zero mesons, and that enables you to see the K-zero and the lambda-zero meson. So we did decay studies on the K-zero and the lambda, and I actually did a piece of that all by myself out at Brandeis. I set up some scanning tables and finished up the work on the lambda-zero on my own. So that sort of was my first independent piece of high-energy physics research.

Sherkow: You also mentioned making your own device.

Kistiakowsky: That was when I was at Columbia. I built this scattering chamber and the detectors and...

Sherkow: Was that difficult?

Kistiakowsky: No. It's fun.

Sherkow: It sounds really impressive.

Kistiakowsky: No. Well, I'm not fantastic with my hands, and I shouldn't mislead you. I can use machine shops and a lathe and a milling machine and stuff like that, but I'm no wizard at building things. But one gets a real pleasure out of doing it, because it's sort of like creating a work of art. I mean, there it is! You did it! So I like it.

Sherkow: Are you saying that the device which you mentioned is not a tremendously sophisticated mechanism?

Kistiakowsky: At the time it was a reasonably sophisticated device. Nowadays, experimental equipment gets built by teams of engineers and technicians and machinists, and so in comparison with something...--[interview interrupted]--

Sherkow: Before the interruption you were discussing your chronology of research, and you mentioned Brandeis last.

Kistiakowsky: Then I went to MIT, and the next thing that we got into was getting a small hydrogen bubble chamber going at the Cambridge Electron Accelerator, and we did some photoproduction physics in that. And that was fun, because that was a small bubble chamber, and it was essentially hand-controlled. I built the electronics that was used for it, so again I had a part of the hardware. And running it, you stood there with one eye on the peephole and one hand on the valve to change the pressure to keep the track; it had a certain pioneering flavor. As a matter of fact, some of the first photoproduction results at high energies came from that bubble chamber experiment.

The next thing we got into was a spark chamber experiment at Brookhaven, and then there was a series of years where we were working on a big bubble chamber for the Cambridge Electron Accelerator. However, there was an accident, and the apparent cause of the accident was that the bubble chamber window broke and spilled liquid hydrogen on the floor. It's very combustible, so that there was a flash fire, and one person was killed and one person was very seriously burned, and a couple other people were injured not quite so seriously. The result was that the bubble chamber was taken away from CEA, the Cambridge Electron Accelerator, and the decision was that it would not be brought back. So there was a period of a few years when the bubble chamber had no home. Then Argonne National Laboratory said they could use it, so it was taken out there. And then they changed their minds. And all of this meant that there was sort of a hiatus in the experimental work, because more work was being put in on trying to get the big bubble chamber working at some suitable

location. But we also then did bubble chamber experiments at Argonne National Laboratory in their bubble chamber, and we did two counter experiments there--a big one and a little one. And I had a major responsibility for both of the counter experiments.

Sherkow: What's a counter experiment?

Kistiakowsky: Well, it's an experiment in which you detect the particles using detection devices which give you a single count when the particle goes through. And it could be something like a scintillation crystal, a sodium iodide crystal, or something like a gas-filled counter like a proportional counter or something like that, as opposed to a bubble chamber, where you have the particles go through and they make bubbles which you photograph. Then you take the film home to MIT and you have people measure the tracks on the pictures. Quite a bit later, all this information that's stored on the film is turned into digital information. In a counter experiment, the particle essentially gives you the digital information immediately, because a count is a digital piece of information. Each kind of experiment has its own particular virtues. However, you have to know what you want to look for when you do a counter experiment, because you have to design the set-up of the counters so that it will detect what you want it to detect. With the bubble chamber, it's just sitting there, and you will see any charged particle that's there. So they are complementary devices, to a certain extent.

Sherkow: Were there other people at the same time as yourself doing similar work in different places?

Kistiakowsky: Yes. It's not very often that you do exactly the same experiment. However, particularly in bubble chamber physics, it's

very frequent that people will be doing an experiment that involves the same particle, either at a different energy or with a different set of criteria for the events you look at. In the counter experiment, it's not very often that two identical experiments get done. Sometimes, when somebody does something and gets a result that is interesting or is not believed for some reason, then somebody else will do the experiment better. But, by and large, one does not exactly repeat what somebody else has done unless there's a very good reason for doing it. But a lot of physics is just doing very similar experiments, where the difference may just be a change in the energy of the particle, simply because doing things at different energies gives you additional information. Even if all that you find out is that you get exactly the same results that Joe Blow did at a lower energy, that still is important information.

After Argonne, we went to SLAC (that's Stanford Linear Accelerator Center), and we did a couple of bubble chamber experiments there. The Argonne and the SLAC experiments were part of a program in which we really wanted to study pi-meson/proton interactions, both as a function of energy and of charge. So we had two energies at Argonne: 3.9 and 5.8 GeV/c. At SLAC we had two energies: 8 and 15 GeV/c. We also wanted to do it was a function of charge, so we had both positive pi-mesons and negative pi-mesons. What we actually had is a sequence of all these bubble chamber experiments; there were eight different kinds of interactions that we were looking at, either pi-plus or pi-minus on proton at four different energies. So we could do charge-dependent and momentum-dependent studies. We're still, as a matter of fact, working on analyzing the results from some of that film. You have to get a lot of events to get results which are statistically significant. It's not a case where one event tells you anything. That's only true

if you're looking for something like a very distinctive new particle. But in the kind of studies that we're doing, you really have to have enough events so that you can at least do a ten-percent experiment, or a one-percent experiment would be even nicer. This means that you get a lot of bubble chamber film, and there are a lot of events to measure, and it just takes time to do it.

The next thing we did was to make a proposal to what was then the National Accelerator Laboratory (now called Fermilab), to use the thirty-inch bubble chamber that was brought there from Argonne National Laboratory. This was the same bubble chamber we used when we ran at Argonne, and it was taken to Fermi Lab. Our proposal was not just to use the bubble chamber, but to use it with a system of proportional wire planes, which would enable us to measure the momenta of very fast particles. A thirty-inch bubble chamber is a rather small device. It gives you only a small length of track for a particle inside the bubble chamber, and there, you can't measure momenta for very energetic particles, simply because of the way you measure the momenta: you have the bubble chamber in a magnetic field, and the charged particles follow curved paths in the magnetic field. If they're very energetic, the curvature of the path is very small, and you can't measure it, simply because there's not enough track length to do a decent measurement. But the low momentum things you can measure. What we did was to put proportional wire planes after the bubble chamber so that one could measure a long distance away from the bubble chamber where these high-momentum particles went. Even if they got a very small amount of deflection in the magnetic field, because you were measuring where they went a long distance away, you got a big displacement for a fairly small angle.

So we put together this system, and our experiment was to do again pi-minus/proton interactions, but this time at 147 GeV/c. That was a very competitive situation. There was another group that had a proposal for a hybrid system using the bubble chamber but using different kinds of detectors, wide-gap spark chambers, not proportional wire planes. And their suggestion, everybody admitted, was not as good technically, but they claimed it was very inexpensive. In fact, at the time that both of these proposals were made, people had used wide-gap spark chambers successfully, and proportional wire planes were still a new kind of thing, and people weren't sure how well they would work. So the other group got a priority, and we had sort of a second-class citizenship. However, in fact, the proportional wire planes worked very well, and the wide-gap spark chambers didn't work terribly well. In the end, the physics that we did was significantly better than what they did.

Next, there was a question whether they would continue that particular bubble chamber program at all, and so there was a showdown last fall in which we demonstrated all the wonderful physics that that bubble chamber program could do. The most recent crisis has been this spring when there was a question of what one should add to the bubble chamber for the next series of experiments, and that actually was settled reasonably amicably between the competitors. And we're waiting now to see whether Fermi Lab will support the suggestion that was made by all the people who are interested in this particular bubble chamber program.

Our current experiment is to study pi-plus p interactions at 147 Ge/c; also some more pi-minus p, simply so we get better statistics. But what we've done is to add to our system a photon detector. Just as in the case of the neutral strange particle work that I mentioned a while ago, if you can detect photons, that means you can detect

pi-zero mesons. So what we can add to what we already know about these interactions is, how many pi-zero mesons are produced, and what are the momenta of the pi-zero mesons that are produced? So that's the experiment that we're sort of embarked on now. The next proposal that we've put in is one using the charged particle external identifier that we hope we will be in the position to build.

Sherkow: Now, these are parts of an atom, right?

Kistiakowsky: Well, yes and no. I mean, yes, they are parts of the atom, but one doesn't look at them as parts of the atom. One looks at them as separate entities.--Normally what you think of as being parts of the atom are the proton, electron and neutron. Pi-mesons, K-mesons, and all of the others are particles that are produced in very high-energy collisions, and in that sense, they're not normal constituents of the atom.

Sherkow: I see. Do you travel a lot? Because there aren't any [high-energy] accelerators--or bubble chambers in Massachusetts?

Kistiakowsky: Well, it has varied from time to time. When we did the counter experiments that I mentioned at Argonne, I did a great deal of traveling because you had to go out there and be with the counters when the experiment was going on. In the case of the bubble chamber runs, so much traveling isn't necessary because the bubble chamber run itself is usually fairly short in duration, and you just go out for a week or so and take turns babysitting the bubble chamber. In a week or two you get your hundred thousand or five hundred thousand pictures, and you bring them back home and spend a year or two or three analyzing them. With the hybrid system that we have at Fermi Lab, there, in fact, is a necessity for somebody to go out there,

simply because it has the proportional wire planes and other stuff associated with it. But up to now, that's something I haven't done. I've stayed at MIT and worked on the data analysis end. I haven't done much out at Fermi Lab. If we do, in fact, build a charged-particle identifier, I will probably be the person in charge of getting it built, and if that happens, then again I will have to do a lot of traveling out to Fermi Lab.

Sherkow: Why are there a lot of people on the work? Is it a number of different people analyzing it?

Kistiakowsky: There is just an awful lot of things that have to be done, and you have to have the people to do them. That's item number one. However there is a further thing. On the recent experiments you will see it's not only a lot of people but it's a lot of institutions. The reason is partly political and partly economic, as well as this question of manpower to do the work. All of the people whose names are on the papers do not contribute equally. However, all of their institutions have contributed money to the apparatus, and it is politically useful to be able to say, "I have this group of all these institutions, with all these people willing to contribute effort to the experiment," to get a big [high energy] accelerator like Fermi Lab to say, "you look like a group that can really handle a big experiment like this; we will give you the bubble chamber pictures." So, there's more to it than just enough people to do the physics. Different people contribute at different levels to the experiment. In the beginning, all the measuring of the bubble chamber events in the Fermi Lab experiment was done at MIT. That's no longer true. Other institutions are now contributing very actively to that.

Sherkow: At the same time that you've been doing this research, then you were also a professor and you were teaching some physics courses.

Kistiakowsky: Yes.

Sherkow: That's a lot to do, it seems to me.

Kistiakowsky: Well, MIT has a very light teaching load. I mean, they expect people to do research, and they make it possible for people to be very active in research. The teaching does take time. There's no question about that. But compared to some places where people teach three or four courses a semester, you don't do that at MIT. You teach the equivalent of one course a semester, and it's do-able. There's also administrative work, both in connection with the experiment itself, and also there's committees for the Institute and committees for the department and that kind of stuff.

Sherkow: And that takes a lot of time.

Kistiakowsky: It varies. It depends which committee you're talking about.

Sherkow: On your biography here, you are a member of a number of different organizations.

Kistiakowsky: I don't list all of them. I've left out NOW, WEAL, National Women's Political Caucus, Federation of Organizations of Professional Women, American Women in Science, and I could go on and on and on.

Sherkow: Are you active in these groups? And if you are, could you talk about what you do in the ones that are listed?

Kistiakowsky: Let me say what I have done. The only society in which I've really been very active is the American Physical Society. I am also active in a very minor way in the American Association for the Advancement of Science. I presumably will get somewhat active in the American Women in Science, AWIS, which is not on your list there, because I just got elected to their executive committee or whatever it is called. In any case, I have some kind of an official capacity there. I shouldn't be so offhand about it. I'm sorry. I don't remember exactly what the title is, but I assume that I will actually get to do something. It's not just a job in name only.

But most of my activity, as I said, was with the American Physical Society, and an organization that I don't even list which is called WISE, Women in Science and Engineering, which is the small local group about which you know because you've seen the WISE goals. That actually was the second organization I got interested in. I guess in the late sixties I joined NOW, and I worked on their academic task force. One of the first things that I did in connection with that was to set up a workshop on women in science for a weekend thing they had on women in the academic world. I and two friends, Vera Pless and Elizabeth Baranger, ran this workshop at that weekend session. We were struck by the enthusiastic response of the audience, who thought this was a <u>great</u> idea to get women scientists together, and one really should keep on doing it. So out of that really <u>very strong</u>, positive response, WISE grew, which is Women in Science and Engineering. It is a very loose, informal group--it's really just a Boston area group--which swells or shrinks from year to year. Sometimes it's basically just an MIT group, and sometimes it grows to include more people. I've continued to be mildly active in that. Again, the amount of activity varies from time to time.

But the whole sequence of events there made a real impression on me: namely, that women scientists, whom I had never considered in the light of likely sources of feminism, might, in fact, be a very good source of feminist point of view. They had the additional advantage that it was easy for me to talk to them. I had problems as a member of NOW. I wasn't very patient with what I considered remarkably sloppy organization, and I also was not used to organizations that had as little money as they did. I mean, their solutions to problems were governed by essentially zero funds, and, as a result, were frequently involved in awful amounts of labor for very little result. I felt under-utilized, to a certain extent.

So when I was at the New York meeting [Feb. 3, 1971] at which the panel was held in which these people spoke that are reported in that article of Physics Today [April 1971, p. 23. "Women in Physics" by Gloria B. Lubkin]--one of my friends, Fay Ajzenberg-Selove, ran the panel, and afterwards I said that this was a great idea and I thought that there should be a committee of the American Physical Society to pursue the problem of women in physics further. She said, "That was a great idea, and why don't you organize one?" And I said, "Well, that was not quite what I had in mind. I had thought that you would be an ideal person to organize one." She said, "No, I have done my bit by running the panel, and why don't you go ahead? I will give you my enthusiastic support." And she did, as a matter of fact. So I contacted fifteen other women physicists that I knew, and we all signed a letter to the American Physical Society Council, requesting they set up a committee to study the status of women in physics. The letter was delivered, and they voted to set up a committee and made me the chairwoman.

So I went back to MIT and I said to myself, "The first thing that I need is money." So I went to a friend in the administration and said, "I have just gotten myself a committee; I need money; do you have any suggestions?" And he said, "Yes, why don't you go and talk to Dr. Wiesner? He might be able to point you in the direction of the right foundations." I guess he gave me an introduction to Dr. Wiesner, because I was met with very great cordiality. In fact, he not only pointed me in the direction of the right foundations; he phoned up the foundations for me, and the result was that I got a ten thousand dollar Sloan Foundation grant. The American Physical Society nearly keeled over in a dead faint, because I was the first committee that had ever come in with money of its own. But in any case, it made all the difference in the world, because it really truly meant that we had money to do things like send out questionnaires, and the committee did, in fact, manage in a very short time to get a report together that was based on data collection.

It was a big committee, and it was purposely a big committee because it was broken up into working groups, and each working group had a specific task, like "women in the academic world" or "women in industry" or "women in government." And it worked reasonably well. Some of the groups were more productive than others. Some of them nearly sent me up the wall. But, in the end, it all got done, and we wrote a report and handed it in. I had the great pleasure of going to the January meeting in 1972 of the American Physical Society Council, and plonking down in front of each council member a document that was this thick. [Several inches]. It was a report plus appendices plus a roster of women in physics. And it created quite a stir.

Sherkow: How long did the research go on?

Kistiakowsky: It was less than a year; that's the point. The committee got set up in April of '71, and the report was handed in January of '72. But American Physical Society committees are one-year appointments. They run from annual meeting to annual meeting, usually. It was just because I presented the letter requesting the committee at the April meeting that it was less than a year. So it got done in a year. The committee continued, and, at my suggestion, Elizabeth Baranger was the chairwoman of the committee the next year. At that time she was at MIT, so we could overlap, and she could find out from me what had gone one, and I could help her when she needed help. And the committee has continued and still exists to this day, and there's now a sort of formalized system whereby people join the committee and then become chairwoman and then become ex-chairwoman; so that there is a continuity in it.

Sherkow: What do they do now?

Kistiakowsky: Well, last year the committee put together a report on women in high school physics teaching. They did most of the work on a booklet for women in high school on careers in physics, and they're now trying to get funds to get that published in reasonably impressive style. This year, they're also carrying out a study of women in junior colleges, community colleges, and technical schools, which was something the original report on women in physics didn't cover. We dealt with four-year colleges and universities, industry, and government.

Sherkow: You had a write-up of that. I've seen that report.

Kistiakowsky: Yes. And that's, in fact, where I guess the preponderance of the women physicists are. The high school study that was carried

out last year turned up the interesting fact that many women who teach high school physics weren't physics majors in college: it sounds as though some of them may have not had very much more physics than the level of the course which they're teaching. But in any case, strictly speaking, many of them are not, physicists. Some of them are. I met a very bright, energetic, enthusiastic woman who teaches, I guess, in Brookline, who I think has an M.A. in physics.

Sherkow: Okay. Now, what about your MIT committees and your activities in them? You have listed a wide variety plus different types [on the vita].

Kistiakowsky: Yes. Well, I guess one which I don't list, since it wasn't a formal committee, was the Women's Forum, which in a sense, is perhaps the most interesting one. The Women's Forum isn't on there, because it wasn't a formal committee. Is it?

Sherkow: No, I don't think so.

Kistiakowsky: Yes. You want me to tell you what these things ["MIT committees and positions" on vita] are? Okay. The panel on November Events in the MIT Community was, in fact, a very interesting committee, because that was the first MIT committee I was ever on. I had been until, I guess, the year previously, a member of the scientific staff and of the Laboratory for Nuclear Science, and, as such, I was not part of the academic staff at MIT and therefore was really not a person who would be asked to serve on MIT committees. However, when I was made a senior research scientist, I became a member of the academic staff, and I was asked to serve on this committee, which considered the break-in of the president's office and the intrusion on the personnel department,

and what one did when there were these semi-violent events on campus and the disregard for law and order and sanctity of office space, or whatever you want to call it, and due regard for the authorities and all of that. It was interesting because it really jerked me out of a very closed cocoon, which is what the research appointment had been. I really had been very protected; I had done physics, and that was essentially all that I did. And this plonked me into politics, it plonked me into the MIT community, and it was also a very good education on how to run a committee, because it was run by Hartley Rogers, who was just one heck of a good chairman. I mean, he had a committee that ranged from quite radical students to quite conservative professors, and he had the major achievement that he got a consensus out of that committee. He did, in fact, get people to talk together and to agree on a reasonable point of view. It wasn't an earth-shaking radical or earth-shaking conservative point of view; it was a compromise point of view. But it was a very reasonable report, and it was a real education in seeing somebody be patient and seeing somebody really respect other people's right to have their say. So from many points of view, that was an interesting experience.

Then there was the Task Force on Faculty and Staff Recruitment, and that was when it became evident to MIT that maybe women were also people that might be considered as an addition to the faculty and staff. Previously, thanks to the fact that there were some really enlightened people in the administration, namely Al Hill as one of them, there was a real appreciation of the fact that one of the consequences of the civil rights movement and the problem of the Blacks not being represented equally throughout society was that places like MIT had a responsibility to do what they could to get more Blacks into professions. My appointment

to this particular panel was, if you like, an afterthought that maybe it wasn't just Blacks, it was also women. But I just want to say that this was before there was outside pressure to do this. This was a purely MIT kind of thing. It didn't come to any great conclusions, but it again was an opportunity to talk to other people, to get to know how MIT ran.

The Committee on Undesignated Sophomores was a standard task-oriented committee. At MIT at the end of your freshman year, you're supposed to pick out a course, and you either decide to go into physics or electrical engineering or economics or whatever.

END

MIT ORAL HISTORY PROGRAM

Project on Women as Scientists and Engineers

Interview with Vera Kistiakowsky by Shirlee Sherkow

Concord, Mass. June 15, 1976

Session 4 transcribed by Janet Billane

Sherkow: This is Shirlee Sherkow, and this is the fourth session with Vera Kistiakowsky at her home in Concord, Massachusetts. I thought we would begin with the MIT committees and other committees listed on your resume. If you could briefly describe your activities in each one, and any particular role you played in them or any particular significance you'd like to note.

Kistiakowsky: Well, the first one is the Panel of November Events in the MIT Community in 1969. I think I've mentioned it before. It's the first MIT committee on which I served, and it was very interesting because it brought me very abruptly into the MIT community and let me see a wide cross section of people and a very wide cross section of viewpoints. I don't know that I really played any role in that committee except as a rather disinterested intelligence on the committee. I had absolutely no axe to grind; I was not of the faculty that had been sinned against, nor the students who were supposedly sinning against them.

Sherkow: Could you also add if there were some things that you felt you had particularly <u>learned</u> from any committee involvement?

Kistiakowsky: Oh, I've mentioned before that I learned a great deal from that particular committee, because I learned an awful lot about MIT. I also had an opportunity to observe a really very good chairman in operation, Hartley Rogers, who did an extremely good job of holding the committee together and getting a consensus out of it.

The next one is the Task Force on Faculty and Staff Recruitment, which was actually a subcommittee that Al Hill set up. That was interesting because it introduced me to some of the problems that were faced by people in Affirmative Action in the very beginning; namely a complete disinterest on the part of the community in anything affirmative, let alone action. And I met a few people on that, but mainly it reinforced my interest in bringing women into the academic community, and MIT in particular.

The next one is the Committee on Undesignated Sophomores, and that was a committee which considered how one would advise students who had not, at the end of their freshman year, chosen a course. The standard MIT situation is: as a freshman you have a freshman advisor, and then at the end of your freshman year, you pick out a course in which you're going to major, and you get an advisor from that course. But there are some people who just aren't ready to make up their minds, and the question is what do you do with them. Then there always had been some kind of ad hoc advisory system, and this committee tried to regularize it. We had some moderately interesting discussions, but it didn't get much administrative backing so, in essence, it sort of collapsed; it didn't get anywhere.

Sherkow: Did you feel it was a useful committee that should have been continued?

Kistiakowsky: I had very mixed feelings about it. The freshman advisory system is very well-administered at MIT, and it's possibly a little bit over-administered. So it wasn't clear to me that you wanted to do the same thing for the undesignated sophomores. And I was an undesignated sophomore advisor for a period of three years; I guess one year longer than I actually served on the committee. I think people who are undesignated sophomores are sufficiently different in character that it really is hard to come up with something that describes all of them.

The next committee on which I served was the Reevaluation Committee for the Laboratory for Nuclear Science, and on that I actually did something. Professor Weisskopf was the chairman, and he appointed me deputy chairwoman, and so I did a major fraction of the work on the committee, in the sense of organizing meetings and so on. So, it was a real challenge to get that going: to get a report written on the status of the Laboratory for Nuclear Science.

Sherkow: How did you achieve that position? Did somebody just say, "Would you do it?"

Kistiakowsky: Well, I have a reputation for being reasonably responsible, and I guess Professor Weisskopf's feeling was that if I said I'd do it, I'd get it done. So, in any case, I ran the meetings, and we got a report together, and hammered it out with Professor Weisskopf and some of the other people who didn't quite agree with the recommendations we had, and we came to a set of recommendations on which the community agreed. It was interesting because I learned a great deal about the administrative structure of MIT: where the overhead goes; what people get for overhead; how the other laboratories function. So

just from a learning point of view, it was interesting. And in the sense that it accomplished something: it came out with a well-defined set of recommendations; it was not a negative experience.

Sherkow: Were there other women on this committee?

Kistiakowsky: No.

Sherkow: I was just curious as to how you became a member of all these committees?

Kistiakowsky: I don't know how I became a member of the Undesignated Sophomore Committee; somebody must have suggested me; I don't know whom. Laboratory for Nuclear Science Reevaluation Committee: they took a cross section of the people in the Laboratory for Nuclear Science, and I don't really know why I was one of the people who was taken for the main committee. I think Professor Weisskopf then asked me to become deputy chair simply because he needed someone who would actually do the work. And you know, he'd serve as an elder statesman to the whole thing; I guess I looked like a reasonable candidate, so he asked me.

Then I was made affirmative action officer of the Physics Department in 1973 by Professor Feshbach, and that's sort of an obvious appointment since I had been concerned with women in science, and had expressed concerns about affirmative action.

Sherkow: You had made known these feelings to other people at MIT or through your activities?

Kistiakowsky: Oh yes; I had even published in letters to the Tech a critique of departments who didn't meet their affirmative action goals.

People know that I'm concerned about this kind of thing. And there was a fair amount of work with this in the first year; as in this position I was also the chair of the Equal Employment Opportunity Committee. The committee and I pulled together ideas for the departmental affirmative action plan; we rewrote the plan, and that was a pretty fair amount of work. In the plan we had some ideas which we had hammered out; the trouble was that the affirmative action ideas didn't work very well, and it's very hard to put your finger on what the problem was. Part of the problem was, I think, internal resistance in the department. The department is very well-intentioned, and as departments go, it does quite well with respect to affirmative action.

Sherkow: Are we just talking about the faculty?

Kistiakowsky: Well, the Committee considered that its mandate extended not only to faculty, but to all members of the department. So, the actual kinds of things with which we concerned ourselves were recruitment for faculty, of women and minorities; making an atmosphere where women and minority faculty could do well; where it wasn't hostile; where they weren't handicapped by some negative attitudes.

We also were concerned with recruitment and support of graduate students and support of undergraduate students. Recruitment of undergraduate students is sort of outside of the department: that's done by the admissions office, and incoming undergraduate students don't specify what department they're going to work in.

And we talked considerably about the secretarial staff in the department. One of the members of the EEO Committee was originally a secretary, and then became administrative staff. And she organized

meetings of the biweekly clerical people in the department. In my opinion this is one of MIT's big problems: it's the 1,500 to 2,000 women that they have employed in secretarial and clerical positions for whom there's no place to go. It's a gigantic bottle funneling into a very small neck, the neck being a very small number of high prestige jobs, high-paid jobs, that represent the ultimate in promotion for these enployees. And, by and large, people don't regard secretaries as being very important or contributory members. Many people treat them essentially as help, rather than as professionals.

Sherkow: You mentioned something about hostility and that the committee did not really work out, but you couldn't really place your finger on the problem?

Kistiakowsky: It wasn't hostility--it was more inertia. I think there are a lot of people in the department who feel that there really isn't any problem and that Affirmative Action is unnecessary; it's reverse discrimination. And if you ask them, they would say they have absolutely nothing against women or minorities; they never would discriminate; they only believe in really fair, equal treatment. It's very hard to deal with this attitude. If you have somebody who says something overt, like, "I think women are inferior," then at least you have something you can get your hands on. But somebody who says, "I think women are fine. I'm all for women scientists. By all means when we find a qualified one, let's hire her. I certainly hope that they get more blacks into physics so that we can find somebody who's good enough to hire in our department." Then you have a very different kind of a problem.

Sherkow: Was there any kind of education?

Kistiakowsky: Well, we tried a number of things, like having the head of the department send out letters on various topics. And it's very hard to change something like that. I think the best way to change it is actually to have the circumstances of the department change so that people learn from things that happen.

Sherkow: I'm not exactly sure what you mean by that.

Kistiakowsky: Well, if you start having a department where 20% of the faculty are women, then the non-female part of the faculty are very quickly going to learn that there is a broad range of women in science, varying from superstars to the opposite of superstars. If you have a very small percentage of the faculty being women, then any one woman starts to personify all women, because you just don't have a large enough sample to see that there, in fact, is a spectrum of women.

Sherkow: Well, how would that work on all of the other levels down to the biweekly?

Kistiakowsky: Well, if you could, in fact, find a road for advancement for the biweekly; if there were some kind of automatic feed from the secretarial positions into the administrative positions, which would be hard because, in essence, it would close off the administrative positions to the young men who don't become secretaries, who usually go directly into those positions. You know, there's a real problem there. Again there are many more secretaries than there are administrative openings. But if you could somehow build a chance for advancement into the system, I think you might find that there were many more secretaries who treated their jobs as a professional opportunity rather

than as something where they went; they didn't much enjoy it; they did what they were told; they earned their salary.

Sherkow: You didn't make much headway on this?

Kistiakowsky: On the secretaries we made absolutely none, simply because most of the rules which govern them are MIT rules and not department rules. What we did manage to do was to get the department to send some letters to all supervisors, pointing out what their responsibilities were as supervisors; and by making sure the secretaries got copies of these letters too, we also let the secretaries know what the supervisors were supposed to know. It's very hard to judge whether something like that does any good.

Sherkow: You have to study the situation now, from when you first began, a couple of years ago, right?

Kistiakowsky: Yes, but it's very hard to do a study like that unless you had a questionnaire then, and sent out the same questionnaire now. I mean, Peggy Richardson had meetings of the biweekly then and, presumably, one could have meetings of the biweekly now. But you know, people have changed too; there's a fair amount of turnover there, so it would be hard to reach a very great conclusion. And we worked on the graduate admissions, and that I think was a useful thing to contribute to. Let's see, what else did we do? We talked. We were a good committee in the sense that we talked very well with each other in discussing the issues. But, it's very hard to make a dent in that particular problem.

The next committee is the Women's Advisory Group, which is a group that advises Mary Rowe, and I was elected to that by the Women's Forum.

It was very interesting to go. It has a cross-section of women from all the women's groups at MIT. At first, it was a little bit slow in getting going, but eventually it did start to function more as a committee, rather than as a luncheon meeting where you went around the table and introduced yourself.

Sherkow: Did it meet regularly?

Kistiakowsky: Once a month it met and it discussed issues with Mary Rowe, and if it came up with a recommendation that Mary Rowe could implement, then she would. But I must say, most of the time it really was just discussing problems at MIT.

Sherkow: Are you still on that?

Kistiakowsky: No, my term ran out in September, 1975, and I asked not to be on the ballot again, because I figured that this was something that people should take turns at doing.

And then the next two are the Physics Department Graduate Program Diagnostic Exam Committee, and then I chaired it the following year. This is just to write an examination, and there's nothing terribly noteworthy about that. Then the Committee on Nominations to the MIT faculty, and that's interesting because I had never been part of any of the faculty committees or the faculty committee structure. I think that you learn a lot about how those kind of things run. I met people from other departments that I had never met before, so it was a very broadening experience. I also have now twice had the opportunity to try to recruit people for the Discipline Committee. And I've learned an awful lot about reactions to being asked: "Do you wish to serve on the Discipline Committee?" which vary from, "Oh my god, no!" to

"I'd love to, but I'm sorry, I'm going to be on sabbatical next year." And that is that.

Sherkow: How did you get on that particular committee?

Kistiakowsky: I was nominated by somebody in the administration. I think somebody dropped out of the committee, or went on leave and they needed a replacement. Somebody in the administration must have suggested me, because I joined the committee late in 1975.

Sherkow: Were you ever asked to be on a committee, and you just had to say "no" for a number of reasons?

Kistiakowsky: Oh yes. No, this just represents the ones where I said "yes." The last one is the Biweekly Working Group, and that is perhaps in a sense the most interesting one. It was in autumn of 1974, there was a group of the biweekly employees at MIT, (this includes the secretaries; they are the biggest part of the biweekly employees) became very unhappy with the lack of response on the part of the MIT administration to requests and questions that they had been making. So they started a drive to unionize the secretaries at MIT, and this generated a real spurt of activity on the part of the administration. I mean, all the things they should have done before, they very quickly started doing. Like, they established a group to consider the problems of the biweekly employees which included a lot of biweekly employees. I mean this was a <u>big</u> group. I think it must have been something like 50 people or so, and it had an equal number of biweekly employees and non-biweekly people. The union organizers, of course, said that this was an effort to stop the unionization.

Sherkow: Wasn't it?

Kistiakowsky: It may have been on the part of the administration. The reason I joined the group was because my estimate was, and I have no reason to think it was an incorrect estimate, that unionization would never go through at MIT. There's such a large fraction of the secretaries who are very conservative, that they would never support such a thing. My feeling was that while the administration was being pushed to do something, it was a good time to get in there and help push them. I don't know: it may be a wrong estimate; I may, in fact, have contributed to stopping the unionization. It's not dead yet. They're still trying.

Sherkow: What was the outcome of the work that you did?

Kistiakowsky: Well, I served on one of the more active subcommittees of this; it was the one that dealt with compensation. And we wrote quite a long report that described all aspects of compensation and also got into things which we really didn't have much business getting into, like benefits other than direct compensation including benefits, such as vacation and sick leave. We wrote a very long and comprehensive report in which there were quite a number of recommendations. That report was sent to the vice-president, Mr. Wynne, vice-president for personnel, I guess he is. And a second wave of the Biweekly Working Group was supposed to deal with trying to implement some of those things.

One thing that I got interested in pushing, not as a member of that subcommittee, but simply because it's something that's always bothered me very much about the secretary's job, is to have included an explicit statement that secretaries could not be requested to do personal work. I've always felt it's very inappropriate that a super-

visor could ask a secretary to do things that really had nothing to do with MIT, and the secretary had to do it, simply because this professor, or whatever, was her supervisor. And there were other people in that group who felt the same way. The net result was that there is now in Policies and Procedures an explicit paragraph on the responsibilities of supervisors, in which there is included the statement that you can not ask an MIT employee to do personal work for you unless it is an explicit part of their job description. That last phrase had to be there because there are, in fact, a few people at MIT whose job is personal work: like the guy who chauffeurs the president and the lady who's the housekeeper of the president's house. But the way it's written, it's quite clear what it means. If the secretary's job description says she has to be able to type 600 words a minute; answer ten phone calls simultaneously, at the same time that she's making trip reservations for all six senior faculty members in her group; and typing two papers, one with her right hand and one with her left hand, then the absence in that description of the fact that she's also supposed to type income tax returns and arrange for birthday presents for the professor's wife and stuff like that is now an explicit statement that this is not something that you can require of her.

Sherkow: Were other recommendations that your committee suggested to the MIT administration implemented?

Kistiakowsky: Some of them. The compensation group made a suggestion that the salary increase be divided into two components: a merit component and a component that automatically went to everybody, which was given the rather unfortunate name of cost-of-living increase. It was an unfortunate name because the amount didn't match the cost of living

by any stretch of the imagination. The feeling was, and it wasn't just staff people, but also the feeling of the secretaries, that they wanted to have performance rewarded. If you had really worked very hard to do a good job, you wanted to be rewarded with respect to somebody who had not worked very hard to do a good job. And so that kind of recommendation was accepted and implemented. Another thing that was said that was very wrong was that there was not very much communication between supervisor and secretary. So a whole new procedure for supervisors talking to secretaries, in connection with the annual review of performance and salary was set up, and that was also implemented. Then there was a recommendation that the effects of the annual review be studied via questionnaire, and that was implemented.

Sherkow: They do that now?

Kistiakowsky: It was done one year, and the annual review is not only being continued, but it now happens twice a year. There are two reviews: one in connection with salary increases, and one that is six months removed from that, which has no relationship to salary increases, but is just a discussion of job performance and job satisfaction. In theory the employee tells the supervisor, "This is a lousy job because you come in cranky in the morning and don't really spell out the day." And the supervisor tells the employee, "I think you're doing a very bad job because of this and because of that." Or, conversely, you know, mutual praise for the good points. It doesn't seem to work terribly well, partly because I think many of the employees are a little reluctant to be very blunt and truthful with their supervisors. And the reverse may also be true: supervisors may not want to harp on what they consider to be minor points, even if they find them irritating.

But I think, by and large, that committee did accomplish fairly much, as committees go; it is just that right now, on some of the really tough recommendations, it is not making any headway, and my guess is that the administration is not too keen on having it make any headway on some of those recommendations.

Sherkow: Could you say what they are?

Kistiakowsky: Well, a good example is the idea of having personal days. A secretary is required to work from eight to five or whatever, and that really means she's supposed to be there. It doesn't mean that she's supposed to work eight hours on some flexible schedule; it means she's supposed to come in at a certain time and leave at a certain time, and if she isn't there the full time, then on her time card, she writes that she worked less than her eight hours. Or, if she works overtime, she's supposed to write it down, and there are rules about overtime. The rules about overtime aren't MIT rules, they're a consequence of a Massachusetts law. In any case, it's a very tightly regimented system, and these individuals are working for professors who come and go as they please, and the perception is that the professor has a fairly easy and happy existence. And the professor says, "But what you don't realize is that when you're at home, I'm still here working, and that I take work home with me; sure, my hours are more flexible, but I actually work a lot more than you do. And what I do requires much more individual responsibility." And the idea was that secretaries should be allowed some of this individual responsibility, and, correspondingly, a little more flexibility that there should be a possibility of taking some personal time during the regular day. The other side of that coin is that it happens now that a lot of people say they're sick, when

they're not sick, simply because they have a personal problem of some kind that they have to solve. And in a sense you can say that the present system is an encouragement for people to be untruthful. So the idea is that if you make it more flexible and make the personal time more available, then this disappears.

Sherkow: Well, some jobs have both sick days and personal days.

Kistiakowsky: I know, but MIT is not very happy with the idea. And a big part of the reason is, in fact, because it has government contracts, and the government agencies would not be very happy with this concept. They would view this as extra vacation days, and therefore less work for the same money.

Sherkow: How do you feel about that?

Kistiakowsky: I think that it's all a smoke screen. But unless somebody pushes on that, that's not going to happen. We also wanted to have a more careful study of salary differences, and there was <u>real</u> reluctance on the part of the administration to get into that. We also wanted to have a really good estimate of what the costs are of the benefit package that's available to the biweekly employees and compare it with the benefits package that's available, say, to administrative staff; what the costs are there. And, I'm not sure that it's reluctance on the part of the administration to have it done; I have a feeling that it's just very hard for them to pin down what are the differences in costs between those two categories of employees. It may just be a very expensive thing to really get at the information there.

Sherkow: So that went by the wayside and the salary--

Kistiakowsky: No, it's all in the form of recommendations, and it's all something that the second round of the Biweekly Working Group is supposed to be thinking and talking about. What happened was, we worked for nearly a year, and we came up with a report, and we presented it. And that time quite a number of us resigned from the committee, on the theory that this was a good breaking point. I had been doing a good deal that year. That was the year that I had a Carnegie Fellowship and was not active in high energy physics, and I had taken this thing on even though there were weeks where we met twice a week for two hour sessions, and then worked at home on a report. So, you know, that was a short-lived, but rather intense committee activity. And when we got to the stage of having gotten our ideas into recommendations, it seemed like a very good time for me to step out of it because there were great pressures to get back and spend more time on the high energy physics.

Sherkow: Have you kept up with the progress of that committee now?

Kistiakowsky: Through people who are still on it, yes. And I don't think it's making any progress; I think it's grounded. They had great difficulty in getting faculty to serve on it. For most of the time that I was on it, I was the only faculty member on it. And I think it's symptomatic of the problem: the faculty think it's not anything very important.

Sherkow: Have you earlier mentioned this Carnegie Fellowship and what you were doing with it?

Kistiakowsky: I don't know. I may not have mentioned it; I don't remember. Well, in the year 1974-1975, I essentially took leave of the high energy group with which I had been doing research. I stayed at MIT and did a variety of other things, including two research projects on demography of women in science.

In the fall of that year, I was a fellow in the Carnegie program, "Women and Career Options." Actually, it's an incorrect way to state it, I understand. It was the "Women and Career Options Program" that was funded by the Carnegie Foundation; it was not a program the foundation ran; they just supported it financially. As a fellow in that program I was supposed to be available to MIT women, and I continued what the previous fellows had done, which was to organize a luncheon for women faculty and staff, that met once a month. And that actually was very interesting. Those luncheons are a good thing, and we had some very interesting luncheons that year.

And then I did the two demographic studies, on both of which I eventually ended up writing a paper. So that's what I did for that one year. And the other side of it was that when I was asked to do things, I had much more of an inclination to say yes. And if you look when I started doing a number of things, you'll see it was that year (1974-1975). That's when I joined the Committee on Nominations, and it's also when I joined the Biweekly Working Group.

Sherkow: What was the purpose of these luncheons?

Kistiakowsky: To get women faculty and staff together to discuss problems of mutual interest. The women faculty, in particular, are spread pretty thin over MIT. Most departments have one or two at most; they are not where they can readily get together and talk to each other.

The women staff were invited because many of them are concerned with the same problems that the women faculty are, and also because it's artificial to make a sharp distinction between staff and faculty. They actually sort of, overlap, through the fact that there are people who are instructors or lecturers or senior research scientists who actually participate in the teaching, but who are not faculty, who are academic staff.

Sherkow: Is the information that's generated at these luncheons disseminated to other people throughout the institution?

Kistiakowsky: Sometimes it was put on paper and sent out that way, but mainly it was mutual information, through the luncheon. If, you know, an issue came up that led to the conclusion that something should be done, then something was done about it. A couple of times a letter was written or something like that. But it was not an action group. It was mutual communication and reinforcement.

Sherkow: This group is still going on now?

Kistiakowsky: Yes, Sheila Widnall ran them last year. I don't know who will run them next year.

Sherkow: If you're a biweekly, then you don't go.

Kistiakowsky: That is a correct statement. We never invited either the biweekly or hourly or exempt personnel to those luncheons. However, when I was running it, if a biweekly employee had asked me to put her on the mailing list, which is essentially the invitation list, I would have done it. I wouldn't have said no. The feeling of some of the people is that one wants to limit it because the faculty have

very special concerns that's not shared by the other people. But, although it's true to some extent, I think the concerns that are shared with other people are many more than the ones that are not.

Sherkow: Well, was the group that large, that they couldn't accommodate a stray biweekly?

Kistiakowsky: Well, there's some sixty women faculty, and on the list that I finally ended up with, I think that there were more than a hundred women staff. If you don't have somebody to fold and address things, a hundred and sixty invitations can get to be a wee mite of a pain.

Sherkow: How many people usually came to these luncheons?

Kistiakowsky: It varied. The most we ever had was about forty, and the least we had was about twenty. So it was somewhere between ten and thirty percent.--[interview interrupted]--

Sherkow: Then you have an additional list on your vita entitled "Other committees." There are about fifteen committees listed here.

Kistiakowsky: You're probably right. I didn't count. Well, the first one is the Committee on Women and Physics, and I mentioned that already. That, I think, was the most inspiring committee I've ever served on, simply because of the response of the other women physicists. It was so very positive to what that committee was doing, that it made me very conscious of the fact that things I had considered personal problems were, in fact, problems of the whole class of women physicists. Also, I think the report we wrote was a good report, and it certainly created a consciousness of the problem in the American Physical Society.

The committee also ended up with a very good reputation: we got our own money; we got a big Sloan grant, and so we didn't cost the society anything; we wrote a very good report in a record short time; we generated a roster of women physicists; we functioned extremely well, and we created a very good image of women physicists as potential committee members. So it was a good thing.

Sherkow: And it's still going on now?

Kistiakowsky: It's still going on now. My feeling was that it was something that should not become the property of any individual, and so I only chaired it for the first year, and then Elizabeth Baranger chaired it for the second year. Then she passed it on to Esther Conwell. Esther passed it on, I guess, to Mildred Widgoff. And Mildred Widgoff to Margaret Law. Margaret Law passed it on to Nancy O'Fallon who is somebody that I've met, but I don't really know. So it's really moving out of the group of women physicists that I knew very well into a much wider group, which is just what should happen. It should have a broad representation.

BEGIN TAPE ONE, SIDE TWO

Sherkow: Will you just continue with the committee involvement that you have on your resumé?

Kistiakowsky: The next one is the Executive Committee of the N.A.L. User's Organization. This is now called, not N.A.L., but Fermi Lab, and it has a user's organization--the users being the scientists from institutions other than Fermi Lab that come and do experiments at the

big accelerator. Since they represent a rather different point of view than the management, they do have an organization which is supported and sanctioned by the management, which elects a group of representatives to discuss the problems of the users, and this is called the Executive Committee. And I was elected in one of their annual elections to the standard two-year term, and I served on that. We discussed a number of problems and a number of things which I considered non-problems. But there was a rather interesting period in which there was a bubble chamber subcommittee which I chaired to consider particular problems of the bubble chamber program. That was a useful thing; it was interesting because I got to meet experimenters I didn't know who were doing very different kinds of experiments from the ones that I was doing. I wouldn't say it was terrifically productive of anything wonderful, but it was a moderately good committee.

The next one is the Panel on Churchill Scholarships, and this is a panel that meets once a year to award scholarships to Americans for either one or three years of graduate study in the University of Cambridge, England, and, particular, in Chruchill College at the University of Cambridge. But you don't have to go to Churchill College; you can go to one of the other colleges if you want to. This is a standard scholarship awards type thing: you get a whole bunch of folders that you're supposed to read, and then you're supposed to rank the people on the basis of merit; then you come to the meeting, and you discuss the various people and come to a conclusion about who should get the awards. I served on it for three years. You know, it's sort of a service type thing.

Sherkow: Were there a great proportion of men or women that were being considered?

Kistiakowsky: It's mainly men, because it is a science scholarship. The first year I was on the panel was also the first year that women were allowed to apply for it. I think the reason I was on the panel was they figured they needed a woman on the panel if they had women applying. The number has increased steadily: that first year it was only one woman, and now it's grown to about ten percent of the applicants in the third year.

Sherkow: What about the people that get accepted? Do you have any idea?

Kistiakowsky: Both the second and third years, we had women who got scholarships, and the numbers are small enough so you can't really say anything very profound statistically. But, both the second and the third year it looked very reasonable. There is a broad spread of applicants. It's not just people in one field; it's people anywhere from anthropology to very theoretical mathematics. So sometimes determinations of relative merit are sort of hard, because, in essence, you're judging them by field. Is it more worthwhile to go and talk to chimpanzees than it is to sit in your office and do abstract mathematics?

The next one is the Panel on the NSF Fellowships that's much the same thing, except these are National Science Foundation Fellowships, and the panel that I was on was just for physics. So there you are restricted to a group of physicists, and it gets to be much easier to make relative comparisons. I served on this for three years as a committee member, and then last year I chaired it. My guess is that I've served my term with them. I think the usual kind of thing is that you're on it for two or three years, and then either you're not on it anymore or you get asked to chair it for an additional year, and that's the end of it.

Sherkow: I wanted to ask you about the Churchill panel, which you talked about before the NSF panel. When you finished, did they have another woman on the committee?

Kistiakowsky: Yes, I suggested Elizabeth Baranger, and they snapped her up. She is my friend, but that's not the reason I suggested her. She's also a very intelligent, sensible person and a very good physicist with an excellent reputation. For something like this, people are very happy to have her.

Sherkow: But it's still just one woman on the committee?

Kistiakowsky: It's still just one woman. You might say there should be two. I think the whole committee is five or six people, so that one woman is ten to twenty percent of the committee. And the percentage of women in science is about at the level of ten percent, at best, maybe less than ten percent, depending on what groups of sciences you include. So, if you start to make a numbers argument, you don't win there. I think it might be useful to have two women, simply from the point of view of talking to each other. But I don't know that it's necessarily true.

Sherkow: But, you said this Churchill Committee was not just science?

Kistiakowsky: Social science. But it's not humanities. It's engineering and science and some of the social sciences, not all of them.

Sherkow: But doesn't that get beyond the ten percent level?

Kistiakowsky: No, not at the doctoral level. The only fields that have really big numbers of women are psychology, which has about 20%,

and I guess anthropology is up in the 20% level.

Sherkow: Not sociology?

Kistiakowsky: Not sociology--that's about twelve-fourteen percent. Doctoral; I'm not talking about bachelors or masters. And all of the physical sciences have gone up somewhat, so what I'm talking about are percentages that are maybe three years old. But physics was still down at the three percent, chemistry was down at the seven percent level, math at the six percent level. Even things like biology which you usually think of being women's fields were only at the ten percent, twelve percent level. The percentages aren't that big.

Sherkow: Well, first I thought it might not be that pleasant to be the only woman on the committee?

Kistiakowsky: Well, I'm used to it. I mean all my career is being an only woman, and either being conscious of it or not being conscious of it.

Sherkow: But wouldn't it encourage the percentages perhaps to go up by having more than one woman on the committee?

Kistiakowsky: I don't think that I really ever tilted things very substantially in favor of women. And I have been in the presence of women who did the opposite. I mean there are some women who are so determined that they will be objective and not be different from men, that they lean over backwards. So it just isn't having a woman, it's what woman you have. And I think the most good that one can do on a committee like that is to try and get people to verbalize some of their feelings about individual candidates, because they sometimes

find when they try to verbalize it, that they're beginning to say things that they find are unacceptable, which makes them stop and think and say something different and come to a different conclusion. But, in terms of a real argument about somebody, usually you end up backing people into a corner, and then they won't change their mind. It's only a few times, that I've had a really all out argument about some particular candidate, and, I guess, most of the times that I've really done it, I've won. But I've also only done it when I really felt that it was something that I could argue very strongly.

Sherkow: Were the arguments related to any particular issue?

Kistiakowsky: It usually is a committee member's basis for judgment being formed by his perception of what have been the successful characteristics of previous applicants, when all the previous applicants were males. My best example doesn't come from the NSF Panel; it comes from MIT undergraduate admissions. The engineer who can look at a person who's applying to MIT, who's studied ballet for eight years and ended up being a soloist in her home town ballet troupe, and say, "We don't want to admit her; she shows no evidence of commitment." It's just tunnel vision. He's so used to looking for soccer team or football team captains and ham radio operators, that ballet sort of is invisible. Then you can do something. You can point out that obviously what he's saying is wrong, and people, usually when they're confronted with this, are willing to admit it, that it's just a difference in their point of view. In some cases you can do something.

It would be nice to have more women on all of the panels. Two years we had two women on the NSF Panel. I've been on it four years; two years I was the only woman, the other two years there was another

woman. On one of those two years, the woman was not very helpful. She was very erratic in her judgments and just not a very useful committee member. The other woman was very nice and very helpful, not just for me, but for the other members of the panel. She was a good person to have on the committee, so it worked very well.

The next one is the Council of the American Physical Society. This is an elective office to which I was elected in 1974, and they have a slate of nominees which are sent to the membership of the society, and you're elected by getting a plurality. The year that I started as a council member, I was also asked to serve on the Budget Committee, which actually functions as a part of the Executive Committee. It doesn't really make up budgets and consider monetary matters but it meets together with the Executive Committee to deal with the business not in the sense of money-oriented business, but day-to-day transactions in the society. That was very interesting because it was a short course in learning how the society worked, and also this was in a time when the American Physical Society was changing rather rapidly from a society that published journals and ran meetings to discuss physics, to its present point of view which is that it's also concerned with the interaction between physics and politics, if you like, to try and help the government to come to some reasonable decisions on matters where physics can give you a technical input. It's also now committed to considering the problems of its membership. There's a committee on professional concerns. It's also getting into the problems of what to teach students; there's a committee on education, and the corollary, do you encourage people to become students in physics or do you worry about whether there will be jobs for them after they get their degrees.

Sherkow: Have they come up with any kind of decision as to how they would answer those questions?

Kistiakowsky: No. You get as many answers to that question as you have people on the committee, by and large, because for every person who says, "There are no jobs; we should stop having people go into physics," you have another person who says that physics is the greatest education, everybody should get a physics degree, and then go on to do something else. But just the fact that it's an issue that's openly discussed and that's important, does tend to make, at least, some small fraction of the membership worry about it. And I think the best thing we can do with something like that is to have individual professors conscious that there is a problem and it's something they should think about themselves. I have my opinion about what's right. But I would hesitate very much in saying that that is something that everybody should believe, because clearly it's founded on being a professor at MIT. And it may be dead wrong for a different group of students in a different institution.

Because of serving on the Budget Committee, I had an opportunity to observe how people were appointed to American Physical Society committees. And I voiced my very strong opinion that it was the buddy system in the worst way. You needed somebody on a committee, and you recommended John Doe at Harvard because John Doe at Harvard had served on lots of committees before and was known to be a good committee member. That meant that Richard Roe, who was out at Podunk U., who had never been on a committee, never got to be on a committee. I said that I thought this way of appointing people to the committees was dead wrong, and something should be done to broaden the participation in the society. As a reward for opening my mouth, I was

appointed the chair of the Committee on Committees, which prepared a report on the committee structure of the American Physical Society, which was discussed at an extended session of the Executive Committee which came up with some recommendations for permanent changes in the society. And, in fact, one of the things that did result was a change in the charge to the Nominations Committee to include helping the society find its committee membership and also mailing out to the members a self-nomination form, so that an individual, if he or she were interested in serving the society, could tell the society they were interested and also list some of the background that might make it possible for one to appoint them to a committee.

Sherkow: So do you feel that this idea has been successfully implemented?

Kistiakowsky: Yes, the person who chaired the nominations committee the first year that all this went into effect was Millie Dresselhaus, and she really picked it up and ran with it. She really has used the self-nomination forms, and she's been an extremely good person to chair that committee while all this was going on. It doesn't work as well as you'd like it to, because even the most broad-minded nominations committee is not going to nominate somebody they don't know and about whom they dan't find any information. So Richard Roe, at Podunk U., is still out of luck if one can't locate somebody or an entry in American Men and Women in Science, that gives some information about him. So, there still is a problem, because if you know nothing about a person, you're not going to appoint them to a committee or nominate them for an office, because you might in fact be getting somebody horrible. What

it does do is bring to the attention of the society that Philip Moe, at some well known university, whom everybody thought had no interest in the American Physical Society, actually would be interested in doing something. Sure, he's a very good scientist; he probably would work out pretty well: let's appoint him, or let's nominate him for an office and see what happens. And you know it's not universities alone, it's also colleges; it's people who previously were overlooked, not because of any discrimination, but simply because their names didn't come to the forefront in any discussion of who might serve. And, of course, my private axe to grind in all of this is that in the past women and the minorities were a group that's conspicuously absent. And I think that that part of it is also working quite well. I mean, an effort is made. But quite correctly, it isn't that you take a woman, come hell or high water. You look at the candidates who say they want to be on Committee X, and if you find you have a woman who looks well-qualified and interesting, then you take her. But if you don't, you don't just pick somebody out of the grab bag.

Sherkow: Well, would it be possible for the people that are interested in being on committees to submit some of the papers that they've done or write a special statement?

Kistiakowsky: There was a place at the bottom of the form where they could put in things like that, and Millie has revised the form--the one that was sent out by myself and Tom Neff the first year. (Tom Neff and I wrote the first form.) She has revised it on the basis of having dealt with the responses to the first form, to include some very specific questions that will help the nominations committee come to decisions. It will be interesting to see whether people are willing to give information in such considerable depth. The original form was essentially a

simple checkoff form, with the exception that at the bottom you could write a statement about previous things you had done that were relevant to what you wanted to do for the society, or you could write a statement of purpose. But, you're quite right. The more information you had, the better off you were.

The outcome of the committee on committees was, first of all, that quite a number of changes were proposed to the council and were voted on. Well, the committee on committees reported to the executive committee. The executive committee considered those recommendations, together with recommendations which it sent on to the council. The council approved most of these and so the society started operating on a new basis: on the basis just of council resolutions, which essentially are good for one year. But it had always been intended that all of this eventually be cast into law. So one of the things that happened was that a committee which existed already, the Committee on Constitution and Bylaws, which usually serves as a rather sleepy committee that only stirs into action when some small legal problem arises, was actually given a big injection of membership. I was asked to chair it, and we were asked to rewrite the constitution of the American Physical Society to be consistent with the whole new scheme of activities that were going on. And we have written a new constitution and sent it out to various people and gotten it back and made changes and sent it out again. It was August, the ballot will go out to the membership asking them to vote to approve the constitution.

Sherkow: It seems that when you are interested in working on an issue, and you suggest something, suddenly you're overwhelmed; you find yourself being asked to be the head of committees. Have you found

that your interest has kind of boomeranged into being overinvolved?

Kistiakowsky: Yes, well, I'm guilty of overcommitment. The thing that has made me popular as a chairperson to the American Physical Society is the fact that the Committee on Women and Physics did so very well that first year. It has, I think, gotten me perhaps more credit than I deserved. It was an issue whose time had come. But we did get a report out in record time. I don't know. Both the Committee on Committees and the Committee on Constitution and Bylaws have gone very well, so I have a good reputation: this is what it comes down to.

Sherkow: I just wondered how you found the time; it seemed like you had to do so much?

Kistiakowsky: Well, I'm sorry that the constitution is dragging out for so long. I've chaired that committee now for a year and a half, and I had hoped that it would all get done this year, but I don't think it will. I think the bylaws will straggle on into next year. But having started it, I don't want to drop it in midstream. But I am sorry it has taken so long.

Sherkow: Has this committee work affected your ability to do as much work as you'd like to do in research?

Kistiakowsky: No. What it has done is to give me a bad image with my research colleagues, because I am apparently spending time on something other than research. Everybody does; my problem is I do it visibly. I get my picture in Physics Today and things like that.

Sherkow: Why are you more visible?

Kistiakowsky: Well, these are fairly visible committees. I mean changing the constitution of the American Physical Society is a relatively visible thing. Serving on the council of the Physical Society is a fairly visible thing. If you just quietly are on a MIT committee, say the Committee on Discipline, and you don't say anything about it, nobody is going to know that you're spending three hours a week on that committee.

Sherkow: Has their criticism influenced you?

Kistiakowsky: It's made me mad. Well, I've realized that you have to either accept people's opinion of you as they see it, (there's no point arguing with it), or you have to be very careful not to create such an opinion.

Sherkow: What are you doing?

Kistiakowsky: I'm now working very hard to reestablish my credentials as a dedicated high energy research physicist.

Sherkow: As a consequence are you retreating?

Kistiakowsky: I'm saying no to things more, when I'm asked to do them, for example, I'm not going to give up the constitution and bylaws until it's done. However, I don't go around telling people what I'm doing on that committee. If somebody asks me, I don't tell any untruths, but I don't advertise.

Sherkow: But it sounds like you agree with their opinion to a certain extent?

Kistiakowsky: No, I don't. I think I'm perfectly capable of doing both things. But, unfortunately, their opinion counts because if you want to be a high energy physicist you have to get funded. If you're going to get funded, you have to be considered to be an active, important member of the high energy physics research community. If people think you're a dilettante, then that doesn't help you.

Sherkow: Is this what you would refer to as the "politics of the profession?"

Kistiakowsky: Yes, it's the religion of being a high energy physicist. Supposedly, if you're a high energy physicist, that's all you're interested in, which is a bunch of bologna. But, in any case there are very many people who essentially put all their efforts and a very major fraction of their working hours into the field, and this is considered the ideal: the person who eats, sleeps, drinks physics.

Sherkow: I suppose it wouldn't be possible to change these people's minds?

Kistiakowsky: No, because there's a germ of truth in it. The people who have the brilliant ideas frequently are the ones who go home still thinking about what they're doing; they go to sleep still thinking about what they're doing; they wake up the next morning, and they say, "Eureka," or some apocryphal story like that.

Sherkow: You're saying both things. At first, you said that you felt that you could do <u>both</u> well.

Kistiakowsky: Yes, but what do you define as being well? There's always the question of better.

Sherkow: Okay, so you're willing to try it; is it more like that than that this is a definite thing that you're not going to be too involved in committee work?

Kistiakowsky: Well, for many years I did nothing but physics. I have started doing some of these other things, and I find that there are aspects of them which are very important to me. For example, the relationship with the other women scientists which developed through the Committee on Women in Physics has made some of these problems very important to me. The consideration, first, of the special problems of the women and then, more generally, of the unrepresented members of the American Physical Society made those changes important to me. They're important in a different way than the physics research, but they also are important. I do research well enough so I think I can do both and still end up doing the research better than most people, which may just be vanity on my part.

Sherkow: I'm just trying to understand what you future course of action is going to be.

Kistiakowsky: It's going to be to say no to everything unless I can't resist.

Sherkow: Okay, and so the "can't resist," is going to be the things that you really feel are important.

Kistiakowsky: Yes. And for a variety of reasons. For example, there's the Committee on Education and Employment of Women in Science and Engineering at the National Academy of Science and the National Research Council, which is a totally worthless committee; it's

absolutely useless. I'm on that because a number of years ago I chaired a conference on women [in] science and technology at the National Academy, which was to try and prod the academy to do a number of things, with respect to women [in] science. Most of the recommendations we made fell with a dull thud. The only thing they did was to set up this committee which bears some vague resemblance to the recommendation we made. I was asked to serve on it and since the academy is very influential in this country, I thought it might be useful to push women at the academy, so I said okay. But it's a do-nothing committee. I'd say it was a waste of time except it meets so seldom that it's not even a waste of time.

The next one is the Committee on Minorities of the American Physical Society. I originally got on that because I was very worried at the real chasm between the blacks and the women. I've been to a number of meetings now where there's been real hostility, on the part of the blacks towards the women.

Sherkow: Black males and females?

Kistiakowsky: Yes, against white women. But mainly black males against white women. There was recently an advertisement for the Black Scholar, and inside there were some quotes from some articles, and one of the quotes was that, "Sure, the white women are doing better because they sleep with the men." It is that kind of perception that bothers me, and the other side of it: the white women who are too elitist and too wrapped up in their own advancement to consider the fact that there are very real problems on the part of the black scientists, that are much bigger than anything that the women really face, in terms of individual barriers. In terms of long-term overcoming of

problems, I'm not so sure. I think, in the long term, it may be easier for the blacks to overcome the barriers that face them, than the women simply because the barriers to the women are so ingrained in the society. And everybody who's male is married to a woman, or has a woman as a mother or a sister or something.

Sherkow: A significant woman in their life?

Kistiakowsky: Yes, but everybody doesn't have a significant black in their life, and so that attitudes toward women are very much ingrained in these individual relationships. It's not true of attitudes towards blacks, and so, I think, in the long run, they'll be easier to change.

Sherkow: Now would this be the kind of committee that in the future you would just <u>not</u> be on?

Kistiakowsky: Well, I don't know. It's a question of putting your money where your mouth is. I think it's an important problem, so this is probably one where I would say yes, even though it's a committee where I play a very minor role. I try to serve as a bridge, mainly from the black community, black physicists, to the Committee on Women. And I try to be helpful; I'm a member of council so I can help this committee in a number of ways. If you like, I'm their token woman; but, not a token in the sense that they can say, "Look, here we have a woman on our committee," but in a sense I'm a token that there <u>are</u> white women who think that this is important enough to spend the time on their committee. And that may be a lousy piece of reasoning on my part, but that's why I feel that it's important.

The next one is a committee which in the future I will say no to, heartily. It's the Nominations Committee of Section X of the American Association for the Advancement of Science. I got snuckered into that by a telephone call that said that no work was involved, would I mind? And I said, "If there's no work involved, why do you need me?" And they said, "Oh, we're just getting tired of phoning people to be on this committee. Won't you please say yes?" So I said yes. It's not very much work, but it's also not a committee where I feel very useful because I don't know most of the people in the membership of that division, and, therefore, I'm not very good at making nominations.

The last thing is the Council of the Association for Women in Science, which is an elective position, and, in my case, is mainly honorary. I guess if I wanted to be active, I could. But I was assured that in accepting a nomination, I was not committing myself to saying that I'd be active on it. There was no stigma attached if I just said yes, and then was on the council without doing much of anything. And that's what I've done.

Sherkow: What's the purpose of being in that kind of a position?

Kistiakowsky: Well, there you ask me a question that I'm not really quite sure of. But if you look at <u>any</u> of these associations, of which the F.A.S. is a good example, you will find that: they have a long list of directors, and then they have a long executive board, and then they have a long lost of something else, and it's basically, I guess, to say, "Look at all the important people that are concerned enough with our organization to be listed." I was given the impression that this was <u>that</u> kind of thing. I was nominated and elected not

because I'm important, but because I have actually made contributions towards problems of women in science. And I'm concerned--if an issue comes up in that association to which I can make a contribution, then I certainly will. But it didn't seem like a thing to take on that I couldn't handle. And it's invisible; that's the other thing. None of the people who consider membership in committees as being detrimental to one's career, are aware of the fact that I'm on this council. They probably don't even realize that the association exists.

Sherkow: That is an added reason to be on it.

Kistiakowsky: Yes!

END OF INTERVIEW

MIT ORAL HISTORY PROGRAM

Project on Women as Scientists and Engineers

Interview with Vera Kistiakowsky by Shirlee Sherkow

Cambridge, Mass. (MIT) August 26, 1976

Session 5 transcribed by Beth Gould

Sherkow: This is Shirlee Sherkow, and I am here with Vera Kistiakowsky on our fifth session, and we are meeting at MIT. Last time we ended with the discussion of your committee participation at MIT and elsewhere. I wanted to backtrack a little bit because there were some questions from the past four sessions that were more or less unanswered. To begin with, I would like to start when you were a graduate student at the University of California in Berkeley during the McCarthy era. We really did not get involved in discussing your particular stand as a student and stands of other students.

Kistiakowsky: There really were not any stands in general, as such. When the University of California instituted the loyalty oath, there were quite a number of the members of both the Radiation Lab and the Physics Department faculty who refused to sign the loyalty oath and left Berkeley. And there were those graduate students who supported these faculty members, sometimes to the extent of going with them when they went somewhere else. There were others who just stayed away from the whole controversy. I was not directly involved. There were no kinds of things like student demonstrations in those days; if

somebody demonstrated, it was just in the sense of leaving the university. But I was not involved in any active sense; it was just that I had a very clear idea of who was right and who was wrong, and it made it difficult for me to deal with people who were on what I considered the wrong side of the fence.

Sherkow: Were there any discussions among students?

Kistiakowsky: I am sure there may have been, but not that I was involved in, no. I have always been quite a solitary person.

Sherkow: Do you know if any graduate students were affected by this particular problem in their careers later on?

Kistiakowsky: No, I do not know. I am sorry; I do not know the answer to that.

Sherkow: Your career was not affected?

Kistiakowsky: No.

Sherkow: Okay.

Kistiakowsky: In order to work at the Radiation Lab, I had already signed a whole bunch of things; it was a laboratory where you had to have a clearance in order to work. So I was already working in an atmosphere where I had sworn to uphold the United States Government, or something to that effect. So the fact that it was then imposed on the university made no practical difference, as far as I was concerned. I guess I was never asked to say, "I had never been a member of the Communist Party," is what it boils down to. I do not know; I just do not remember. My impression at the time was that it did not

impinge on me directly.

Sherkow: Did you feel that you could not speak out as an individual?

Kistiakowsky: I never had a feeling I could not speak out. I did have a feeling that I should be circumspect, but that stemmed from something different, which was in my second year as a graduate student. My father phoned me up in considerable agitation and said that he had been asked by--I guess FBI, but I am not sure, but I think FBI--what his daughter was doing at a Communist Party meeting. So his question to me was, "What are you getting yourself into?" And I said, I had never been at anything remotely like a Communist Party meeting, and unless they were talking about the International House Folk Dance Society, as far as I know, I had been at no meetings, whatsoever. So it was either a case of mistaken identity, or it was a case of provocation, you know, a fishing expedition. But it did make me conscious of the fact that people might be watching me because of the fact that I was my father's daughter. So I think I would have avoided doing anything that I did not consider necessary that might be misinterpreted. However, if I had felt something was necessary, I would have done it, anyway. But, it did not arise. But that little story is, perhaps, not a bad illustration of what the climate at the time was like.

Sherkow: I had also been thinking if any of your friends who were graduate students might have left?

Kistiakowsky: They were pretty darn apolitical. No. The bunch that I knew best did not, and were not concerned.

Sherkow: In 1951, you got married, and you were still working on your Ph.D.

Kistiakowsky: Right.

Sherkow: I guess you got your Ph.D. the next year. I was wondering if you noticed any changes in the way people related to you once you got married? I was thinking of faculty members and fellow graduate students.

Kistiakowsky: No.

Sherkow: No difference. Okay. Jumping to your separation--

Kistiakowsky: Yes.

Sherkow: In 1965--I was wondering how your separation affected your colleagues. At the time you were working for the Lab for Nuclear Science at MIT.

Kistiakowsky: They were surprised and concerned for me, and that was about all. They were all very supportive and non-judgmental.

Sherkow: So you did not notice any particular attitude changes?

Kistiakowsky: No.

Sherkow: Was there any kind of a problem at social occasions? Were you not invited, or were you just invited now by yourself?

Kistiakowsky: What happened was that the kind of invitations that we had received jointly because of my professional connections, I continued to receive, and the kind of invitations we had received jointly

because of Gerry's professional connections, I did not continue to receive. We had had very little social life outside of those professional connections, with the exception of my family, who continued to invite me by myself. So it really did not make that much [difference]. There were just some invitations that I did not get.

Sherkow: Another issue that is more prominent today than in the middle '60's was the name change. I was wondering how you dealt with that, in terms of publications, and in other areas.

Kistiakowsky: Well, I made a mess of it; that is what I did. When I got married, I intended to continue to publish under my maiden name. But the first place I went to work was the U.S. Naval Radiological Laboratory, and when I wanted to sign-up with them under my professional name, they were not having it. If I was married, by God, I was Mrs. Fischer.

Sherkow: You tried to do it, and they just rejected it?

Kistiakowsky: That is right. And at the time, I really was not that consciousness-raised; I had a feeling it was wrong, and this is not what I wanted, but seven thousand dollars a year was a lot of money in those days, so I signed up as Mrs. Fischer. For some reason, that led to me publishing as Vera K. Fischer, and I continued to do that all the years that I worked in nuclear physics, and then, even the first few years I was at MIT. But one of the consequences of the separation was that I said very firmly, "This has been a mistake all along, and I now have a good rationale for changing." So, I went back to using my maiden name.

I think about four or five years after that, I began to run into a dual identity problem; all my credit cards were in one name, and all my professional life was in another name. So I actually went to court and had it legally changed back to Kistiakowsky. I asked the family lawyer if there would be problems, and he said, that it was impossible. I could not do it. I had minor children, and the court would never grant me a name change. So went to court, prepared with all kinds of good arguments, and it took all of thirty seconds. The judge said, "Kistiakowsky, are you related to George Kistiakowsky?" I said, "Yes, I am his daughter." And he said, "Hmm. Well, that is a good reason for wanting to change your name. Request granted." [Laughs]

Sherkow: [Laughs]

Kistiakowsky: And that was that.

Sherkow: One, two, three.

Kistiakowsky: Yes. So my lawyer's fees were totally unnecessary, and the lawyer was standing there looking very sheepish.

Sherkow: What about your publications? I know when I was looking at your publication list, I was utterly confused because I just did not connect it at all; that that was your work.

Kistiakowsky: No, it makes it difficult for anybody who reads the professional biography. They have to know that I did publish as Vera K. Fischer. I guess I should actually put a footnote on it, or something.

Sherkow: I was wondering if library people might do that. It probably happens so often, they just could not.

Kistiakowsky: I am sure that all the publications under Vera K. Fischer are not connected with those under Vera Kistiakowsky.

Sherkow: Right. No, I was just thinking that it might be their responsibility.

Kistiakowsky: I do not think so.

Sherkow: That would be impossible, probably.

Kistiakowsky: Yes. I think it is a very good argument for nobody taking their husband's name, because you never know when you might end up publishing.

Sherkow: Yes, I do not know why they started it in the first place.

Kistiakowsky: Because women were the husband's possession for the purpose of producing the husband's children.

Sherkow: That might be a good thing to look into. I do not know how much trouble would be involved in putting some kind of asterisk on those articles.

Another question that I did not get into at all when you were dicussing your various research projects was the division of labor on these research projects. I thought maybe you could talk about how it was decided who would do what, and what your roles were. I had thought of your discussing the most recent work, which is this proposal; you had mentioned that you would be the one who would build the charged-particle identifier.

Kistiakowsky: That is an oversimplification. We are going to have a meeting on September eleventh and twelfth at which it will be decided who will build the charged-particle identifier. When I said that, I was being optimistic. If "I get to build it", what it actually means is that I will be the person responsible for seeing that it gets build and works, but the actual work will be done by a number of people at a number of institutions, simply because it is a very big job. It would not be possible to do it completely at MIT in any reasonable length of time; we just do not have the--pardon the term--manpower to get it done here.

Sherkow: How do you decide who does what work?

Kistiakowsky: It is usually done very amorphously. If I am going to be the person who builds ISIS, then I will ask for volunteers. These volunteers will be the committee to build ISIS, and we will have a committee meeting, and at that meeting, we will discuss who will do what. It is not idle discussion because if people say they will build the electronics, they have to have the facilities to build them and the expertise to build them. So it is not just who wants to do what; it is who is capable of doing what. If it turns out that two groups want to do the same thing, then at that meeting, it has to be argued how this gets resolved. These are all very competent people, and they are all respected people; you can not just sit up there and say, "You do this, and you do this." It has to be done by agreement that the most sensible thing to do, given you have a certain set of people who are interested, is the following pattern.

Inside MIT, you do not have quite the same problem; you are in a little bit better position to say, "So and so will do this, and

so andso will do that." But, again, it is pretty much by consensus. I end up doing some things I do not want to do; like, I am going to write the progress report again this year, which is something I would cheerfully pay somebody a good deal of money to do. But the fact of the matter is there are four people who can write it, and I have finally been beaten into the ground by arguments that show that I am the person who probably should write it again this year, in terms of what other people are doing and how it can be fit into a schedule of work.

Sherkow: How about some of the other research projects you mentioned, like the counter experiments you ran?

Kistiakowsky: That was before I was a professor, so it was a somewhat different situation. When we did the backward charge-exchange experiment, Irwin Pless was the person who was very definitely in charge of the group at that time. There really was no democracy; it was the Pless group because everybody else was junior to him, no two ways about it. He asked me, "Would I like to do that experiment?" And I said, "Yes." It is greatly to his credit that he is willing to let me do it because of the fact that it was a very nice experiment, and if he had headed it, then he could have taken more credit for it. But it was the thing that made it possible for me to establish an independent identity in the group. I had an experiment of my own, and it turned out very well; therefore it was a very good support for personal advancement.

Sherkow: Did the other junior people <u>not</u> have their own experiment?

Kistiakowsky: Eventually, yes. He is very good. He has been very good at that kind of thing. We now have junior people in the group, and we still do the same thing; we try to really look out for the junior people in the sense that they should be given an opportunity to show what they can do. Which is not as common as one might wish it were; there are high energy groups that just operate as factories to get the work out, and if somebody devotes years to doing something that does not lead to anything good for him, personally, that is just tough.

Sherkow: You mentioned this progress report that you will be doing. Why is it that you would be best-suited to doing that?

Kistiakowsky: I got talked into the ground. I got told how much everybody else was doing, not in terms of the interesting jobs--I mean, building ISIS is interesting; it is something one wants to do, so that does not count--but in terms of, if you will pardon me, the "shit" work that needs to be done, we looked at all the little piles of manure, and I finally agreed that mine was somewhat smaller than others', and therefore, I am doing this.

Sherkow: But it is not the only thing you are doing?

Kistiakowsky: No. It is no big deal. It is just something that takes time and is no joy, whatsoever.

Sherkow: You have been involved in a number of bubble chamber experiments. I thought you could explain in those experiments what your role was. I have three down: The Argonne National Laboratory, the SLAC Bubble Chamber Experiments, and then the Proportional Wire-Counter Experiment at the National Accelerator Lab.

Kistiakowsky: Yes. I have done various things in various experiments. There are, basically, three or four phases in each experiment. There is the first phase where you write a proposal, and when you are accepted, you go to the laboratory, and you get the bubble chamber pictures; this is the data acquisition phase. The next phase is bringing the film back to your laboratory and getting the bubble chamber pictures measured; that has certain technical problems involved in it. Then the third phase is getting it run through all the programs that turn these measurements into momenta and angles; deciding from this momenta and angle information, what a particular event is, using conservation of energy and momentum to decide that this a pi-hitting a proton, and you are getting a pi- and a proton, and pi^+ and pi^- out; that is the third phase, all of this program analysis of the data. What you end up with at that point is a data summary tape of some kind. Then the last phase is taking the data summary tape, trying to make sense of it in some fashion, drawing whatever conclusions you can from the data, and writing it up as papers.

I have been involved in all four of these phases in different experiments. The one that I have done least with is the third one, which involves the big kinematic and geometric reconstruction programs. In the past, I have had some connection with them but not as much as the other three phases. I am currently picking up a responsibility for one of the big programs, a geometry program called Geomat, and by the time I am finished with that, I will have the same kind of experience with that third phase as I do with the other three. But, basically, I have done all of them.

What you do in a particular experiment is partly what you want to do, partly what needs to be done and who is available to do it.

I mean, the fun things are the first part and the last part; the two in-between parts are much more demanding, much more time-consuming, much more nitty gritty detailed kind of work, if you like. Doing a bubble chamber run is fun, and getting the physics out of the data is fun, but seeing that things get scanned and measured properly is vital to getting physics out; if you do not do a good job on it, then you might as well forget about any physics. But "fun" is not exactly quite the adjective. And the same thing with programming, especially in such big data-handling programs; it is necessary, it is vital to the physics. You can not say, "It is not fun," and therefore somebody else has to do it. You can get away with that part of the time, and if there are four senior people in the group, you can get away with it exactly twenty-five percent of the time.

Sherkow: In these bubble chamber experiments, what has been your interaction with other people?

Kistiakowsky: Well, there is always a lot of interaction with other people in the group. With the Fermi Lab experiment, there has also been a lot of interaction with people at other universities. If I build ISIS, it will be in collaboration with eleven other institutions, or some fraction of eleven other institutions. It will be as much handling people and seeing that they get the job done--work--as a physics enterprise. Because, as I said, MIT can not build it by itself. Therefore, parts of it are going to have to be built elsewhere, and they are going to have to be built so that I am satisfied they work. And I am going to have to convince people that the demands I place on what they do are sensible and necessary.

Sherkow: Are you in a senior position in this particular proposal? Are you the head of it?

Kistiakowsky: No. All of the Fermi Lab work, for all of the universities, not just MIT, has as its spokesman, Irwin Pless. So he is the person who is the spokesman for the whole project. Now, spokesman is not meant to mean "senior"; it means, in fact, that it is the person who speaks for that whole project. But if you wanted to identify the senior person, then he would be it. Now, there are some very elevated physicists at the other universities who might take exception to that statement, but I think it is an accurate one. But, in the sense of who are the leading people in the Fermi Lab experiment, if I build ISIS, then certainly I will be one of them, since I will have contributed a very major part of the next round of experiments.

Sherkow: Coming to the decision on who is going to be building this, is that a democratic process?

Kistiakowsky: No. It is again a consensus because it will be a difficult job to do right; you do not exactly know what you have to do to make it work. So it is not just taking some blueprints and turning it into a device. There is a lot of physics that you have to go through before you end up with a working device. There is even the possibility it may not work because such a device has not yet worked. But, in my opinion, that is not a very big possibility. The rewards are considerable if you are the person who builds an ISIS that does a very good job of distinguishing particles; the reward is that you have made a very real contribution, and people generally remember that kind of thing.

Sherkow: What do you think are your chances of getting that position?

Kistiakowsky: Oh, they are pretty good because I have been getting information; I know more about ISIS than anybody else. I also have a lot of related expertise at MIT at my disposal. So both institutionally and in terms of my personal efforts, I am a very good candidate. Now, I have two things against me: one, that I am woman, and that is against me, and two, that I took a year off to piddle around, writing papers on women in science and other such frivolous things, and therefore I am not viewed as being as dedicated as I should be.

Sherkow: Is that the kind of thing that would be brought up in this discussion?

Kistiakowsky: No, but it would be in people's minds.

Sherkow: Are most of the other people that you would be discussing this with men?

Kistiakowsky: All.

Sherkow: All? Oh, you are the only woman.

Kistiakowsky: In the consortium, the other women besides myself are Mildred Widgoff, who is at Brown, and Betsy Hafen, who is at MIT. So we do have other women physicists. But that is it; just two. Betsy is junior, so she will not be in on any of the discussion. Mildred is not; she is an equal partner at Brown, so she will be in the discussion. But in terms of all the people who want to do it and who will work on it, they are all men.

Sherkow: Do they have a bias against women?

Kistiakowsky: I think if you ask them individually, each one would say, "How ridiculous! Of course I do not." But, biases are very frequently things that one can't really pin down.

Sherkow: I am hearing you say that this is what you feel--

Kistiakowsky: Yes.

Sherkow: Maybe the majority of the people feel...

Kistiakowsky: Well, okay, there is a third thing that is against me, and that is that I have not built anything since the bubble chamber electronics in 1966 and 1967. I have been working on data analysis. It is not quite true because I worked on the counter experiments, and there was some equipment involved in that. But in terms of building major things, I have not recently built anything. I do not have a reputation for being a hardware person, which is, in a sense, unfair, because there is hardware in my past, but what I am known for is being able to write papers, which I think people give me credit for turning physics into papers and doing a good job of it.

Sherkow: Are you anticipating a battle of sorts?

Kistiakowsky: I think it will be settled in private by smoke-filled rooms, and I do not think there will be an open battle of any kind. I am also very relaxed; if it does not work, I will just do something else. I am not particularly strung-up on the success of this. I have done everything that I can to maximize the possibility, and if it does not go, it does not go. However, if it does not go, then something else will have to happen to give me a chance to, if you like, make a very independent mark on the Fermi Lab experiment, or I will get out

of it. I mean, my ego is at stake. I want to do more than just analyze data into papers.

Sherkow: So you might consider--

Kistiakowsky: Doing something different.

Sherkow: That you would initiate yourself?

Kistiakowsky: That I would initiate myself. This was a chance to do something that was in the mainstream of what the Fermi Lab projects was doing, that would give me the sense of identity that seems to be missing at present, even though I am told I have it all wrong; this is the feeling I have. And if I can not do it in the mainstream, then I will do something else.

Sherkow: Would it be an independent project?

Kistiakowsky: I think I have said before, it is very hard to start a high energy physics experiment because it costs a lot of money. So, you cannot say, "I am going to do an experiment." You have to get a great idea. Then you have to convince a laboratory that it is a great idea. Then you have to convince an agency that they want to give you money for it, and that will be very hard at MIT because ERDA [Energy Research Development Agency], which is the agency that does most of the funding of the big high energy groups, is already giving MIT a great deal of money for high energy physics. What ERDA will say is, "Oh, take some of the money we have already given you away from something else, and give it to this very deserving person if you think that she really should do that experiment." So they won't give any extra money; they will just toss it back to the laboratory.

If I ask you to apply to NSF, I may or may be allowed to do it. You see, you can not make an application; you have to go through the Office of Sponsored Research here at MIT. You have to get all kinds of signatures on it, including, I think, the Vice-President for Research. If it looks as though you do not have the capability, in terms of support, to do the research you propose to do, MIT is not going to let you put in the proposal. Or, if it is in conflict with the general plan of the laboratory, they might also not let you put in the proposal. So you are not a completely free agent. And even given that one put in the proposal, there is a sizeable probability, based on what has happened in the past, that NSF would just say, "Oh, ERDA is giving you so much money, we really do not think that NSF can give MIT any more money." So, it is not that easy to start to do something one's self. But it is not impossible.

Sherkow: That would be the route that you would go?

Kistiakowsky: No, I would have to see what would make the most sense. I do not believe in crossing bridges until I get to them.

Sherkow: In an earlier session we were talking about the opposition of women to the equal rights amendment. At that point, I cut you off, and I said, "We have got to get back to Mount Holyoke," or whatever it was, and I was really interested. I realized, in going through the past sessions, we never did pick it up. Even though it is not part of your-year-to-year life history, I would like to know what you think about this problem.

Kistiakowsky: The thing that I have run into a number of times since I have become a vocal feminist is that I meet some woman--usually a

well-educated woman, frequently the wife of a professor--who is very upset with me because I am, to her, advocating that a woman must have a career and do great things, and that a woman who stays home and is "just a housewife"--to use her phrase, not mine--is wrong, that I am making some kind of a judgment. I get pinned in a corner, and I get told about how her husband could not have succeeded unless she had given him all this support over the years, and how worthwhile, and fulfilling, and so forth and so on, it is. And I say the truth: "If it is so worthwhile and fulfilling, then fine; that is what you should have done." I do not say what I always think, which is "If it was that worthwhile and fulfilling, why are you so defensive about it?" But I think part of the opposition to ERA comes from women who have followed a certain life pattern that involves difference--and they may not view it as lack of equality, but a very different kind of status for women than for men. They may even view it as <u>better</u> than equality; you are put on a pedestal, and in many respects you are better. And since their whole life has been structured on this, they have to view it as being right, and anything that threatens it is a personal threat. I think that is where all this massive support for anti-ERA is coming from: women who just feel very threatened with the idea that they might have been wrong all their lives. But that is amateur psychology--amateur socio-psychology.

Sherkow: It is one of the biggest problems, I think.

Kistiakowsky: Yes. When a young girl says it, I just figure that she has grown up with certain expectations, and now all of a sudden, the world around her is asking her to examine those expectations, and she is just scared. Now, from the time she was old enough to think, she

knew she was going to get married and have kids and be a mommy like her mommy. Now, all of a sudden, there is this awful apectre she might have to do something else. And that is understandable, too. It is very comforting to know where you fit into society.

Sherkow: I just do not understand. I always felt that the women's movement was not saying that what you are doing, as a housewife, has to be abandoned; just that if women want to pursue careers, they should be allowed to do it.

Kistiakowsky: I agree with you a hundred percent. I do not know whether that is what it is saying, but that is certainly what it should say. The corollary is the same thing should be said to men; there is no expectation that you do any particular kind of thing and there is no particular role you have got to fill. If you marry a particular woman, then the two of you better be very clear about who is going to fill what role before you get married, otherwise there is going to be a calamity. But any set of roles that you choose are going to be perfectly okay. Like the secretary of AWIS is a man, and I am sure that since he has that particular job, he enjoys being the secretary of the Association for Women in Science.

Sherkow: I did not even know that there were men in the Association for Women in Science. I did not know there were men in the organization.

Kistiakowsky: Yes, it is open to men and women. I think all the women's organizations are non-discriminatory.

Sherkow: I did not know that; I did not realize that.

Kistiakowsky: Yes. Certainly AWIS is; I know a number of men who belong.

It is the "Association for Women in Science," but not "'of' Women in Science." Same thing here at MIT. It used to be Association of Women Students; it is not any longer; it is Association for Women Students, simply so that men can join; it is non-discriminatory, and it can get funds from the student organization--whatever that board is that funds student organizations.

Sherkow: You are saying, then, that it is fine and good that this man is a secretary, right? It does not have to be a woman.

Kistiakowsky: Yes, and clearly he enjoys it. He enjoys the fact that he is in this role-reversal kind of position. Of course, it is not really because there are many corporations, and so on, that have men who have the title, "Secretary," and so it is not really that much of a role-reversal. But in this particular context, it does sound somewhat like a role-reversal.

Sherkow: Do you think that is good to have all the organizations open to men and women?

Kistiakowsky: I think so, yes. Now, the League of Women Voters has done that, also. They used to be closed to men, but they decided that they would now let men become members. The reason they used to be closed to men was because they were afraid that if men were members, they would take over the organization--at least this is what I have been told. I guess that is a fear that women are no longer so much prone to because once you get convinced that women are as competent as men, then you no longer worry about men taking over when they have the chance.

Sherkow: I see.

BEGIN TAPE ONE, SIDE TWO

Sherkow: I would like to move on to the groups that you were involved in. One that you specifically mentioned being very involved in, which you never got around to talking about it, was the Women's Forum here at MIT.

Kistiakowsky: Yes. The Women's Forum grew out of a seminar which was run by Millie [Mildred Dresselhaus], and Emily Wick, and Sheila Widnall. The first meeting of this seminar was in January of 1971. It was originally conceived of as an IAP [Independent Activities Period] seminar where women students could come and discuss women at MIT. Like other IAP seminars, it was open to other members of the community, and they were astounded when--I forget whether it was one hundred or a hundred and fifty or two hundred--but just a phenomenal number of women showed up for that first meeting. It was clear that there was an awful lot of sentiment that there should be discussion of women's problems at MIT. So, the seminar split off into subgroups, one of which was essentially the original seminar, and then there was a subgroup on staff and faculty, and there was one on the bi-weekly clerical and administrative type workers--there were three.

Sherkow: How did this originate?

Kistiakowsky: It was a seminar. It was just advertised as as Independent Activities seminar.

Sherkow: Was it the idea of all three of you?

Kistiakowsky: No, I was not in on that seminar. No, it was Millie,

Sheila Widnall and Emily Wick. About the same time, a committee was appointed to study the situation of women students at MIT; this is something not connected with the forum but which went on in parallel with the forum. So there was still another group which was this committee looking at women students at MIT.

But, in any case, it was clear that what was going on was not just a small group of students talking about women at MIT. And, at some point, the name, "Women's Forum," emerged from this; I do not really know when. I worked in the Staff-Faculty Group, and out of this group came a proposal for having at MIT two women who would be responsible for overseeing the condition of women at MIT, a Woman's Office, and we had some other proposals, too. But, basically, the idea was that there should be some formal structure at MIT which would look after women. So the thing that I was most active in that first year was writing that proposal, and it was rather gently but fairly firmly turned down on the grounds that it was somewhat too greedy; one could not possibly have two women and a big office with support. The suggestion came back that--how it should be modi fied --so, there was a lot of talk about whether one should modify the proposal.

Sherkow: Did you modify the proposal?

Kistiakowsky: No, we stuck to the two women. Then, finally, we were told it only--I do not know if we ever rewrote it to--I do not think so; I could look it up. But, in any case, the end result was that finally Mary Rowe was hired, and her office was set up. It was not what we had suggested; it was, in a sense, much more modest.

Sherkow: You had suggested <u>two</u> people.

Kistiakowsky: Yes.

Sherkow: And you got one.

Kistiakowsky: We got one. It is just too big a job for one person. She has made out of her position something that is extremely good and very useful to the community, but, simply because she is only one human being, she has not done everything that one might have hoped could get done. So the first thing we did was to work on a proposal and then discuss it with the administration.

While this was going on, at the same time, we decided to hold a series of meetings the following year. We decided, as a matter of fact, to have them be weekly meetings. So another thing that we did was to work on a set of weekly meetings for women at MIT. I guess, probably, it was at that point, that the name "Women's Forum" was born because this would be the forum where women could get together to discuss various things. I was moderately active in the planning for that, and I have tried to go to as many meetings as I could. I have spoken at some of the meetings. Then the year after that--'72-'74; I would have to get out my history of the Women's Forum because I am a little fuzzy on that.

Sherkow: Do you have that, too?

Kistiakowsky: I can see if I can find it; Dotty Bowe wrote it up. She was very active in all of this, also. I am wrong; it was not Sheila Widnall, it was Dotty Bowe. It was Emily Wick, Millie Dresselhaus, and Dotty Bowe who ran that seminar. I am dead wrong. Yes. In any case, there was a year--and I guess it was the year that I was a Carnegie Fellow--that I was very active on the Women's Forum Steering Committee, and it was the year that we got Gloria Steinem to come here and speak;

there was a lot of upset and confusion in connection with that, partly because this was also the year where AWARE got organized. AWARE thought--I believe still thinks--that the Women's Forum is a reactionary--Well, no, I guess not; there are a lot of AWARE members who are now on the Forum Steering Committee, so I guess being on the Forum Steering Committee, they can not think it is reactionary. But, it was a very complicated time, and I participated in all of that year. Then last year, I was much less active; I was not on the Forum Steering Committee. I did try to go to meetings occasionally, but simply because of pressure of other things to do, [I could not be as active].

Sherkow: In what other ways was the office that Mary Rowe is involved in now modest in comparison with your original proposal?

Kistiakowsky: The original proposal had in it the idea of an affirmative action judiciary. As I think I have mentioned before, the departments at MIT have a great deal of autonomy, and so the administration was not really willing to have somebody who was in a position to go and tell the departments what to do. There is a thing which is the Appointments Subcommittee of the Academic Council which is in a position to approve or deny appointments that the departments would like to make. The proposal that was made was that one of the two women that would have one of these positions would be a faculty member with clout, who would be a member of the Academic Council and would sit on the Appointments Subcommittee and have a major vote on appointments. Now, this has worked out in the sense that Mary does have input into these matters, but not as what you might call a judiciary; she has an advisory input. She feels that this is the most one can do, and she is in the position to know that it would not be possible to have a woman at MIT who would

say, "You can do this, and you can not do that." But that is not the way we viewed it originally. She has also taken into her position a lot of what the other woman would have done, which is talking to people who are having problems, trying to help them with the problems. She has combined aspects from both roles. But, the talking to people and dealing with individual problems is just very time-consuming for her, and so it does tend to get into the other areas a little bit.

Sherkow: As I understand it, her particular office is being cut down. Do you know why this is happening?

Kistiakowsky: Because there are a lot of people at MIT who think that it is a waste of money, and we have no money--or very little money--these days, and therefore what you cut down are things that are most wasteful. That is why.

Sherkow: But who is this that decides that women's affairs are wasteful? Isn't that what it comes down to?

Kistiakowsky: Well, you know, it is never said that way. But what you have is an upper-level of the administration that, I believe, is sincerely committed to the idea that there should be equal opportunity at MIT. I really truly think both [Jerome] Wiesner and [Paul] Gray believe this. However, they also are in a position where they can not disbelieve the head of a department when he says [that] he can not find any women. All they can do is to say, "Well, go and document what you have done; what kind of searches you have made." And if he comes back and says [that] he consulted his navel, then they are in a position to say, "You have to look a little further than that." But, nobody is going to call

him a liar; all they are going to do is to say, "You have to do a little more work."

Now, there are a lot of people at MIT who think that there is no problem; there just are not very many qualified women, or there are no qualified women; you should not waste time, effort, and money on trying to find them. And, sure, there are women who have gripes at MIT, but there are also a lot of men who have gripes, and you should not have an office particularly to deal with these gripes. If you are in a time where there is a lot of money, maybe you can afford such frills because it is the "in" thing to do, but if you are having to cut back all kinds of budgets, the it just is not right that one should preserve these things that really are not serving a useful purpose.

Sherkow: How do you feel about that?

Kistiakowsky: Oh, I think they are dead wrong. I think one has a very large legacy of discriminatory attitudes towards women, and the people just do not recognize them as such, and I think the only way that you are going to change things is to keep pointing out to people, when they act in such a fashion, what they are doing. Some people will never learn, and you will just have to wait until they retire. But, if you set the climate, at least maybe you can prevent new people with that kind of attitude from entrenching themselves. I think it is very important. I am sorry that Mary's office does not have more clout than it does. I was one of the people who was very adamant that whoever sat in that office should be in a position not just to give advice, but to make decisions.

Sherkow: You feel she has been relegated mostly to the position of giving advice to women workers here?

Kistiakowsky: I do not think she has been relegated; I think that was how she was hired. Not just to women workers, no. She gives advice to department chairmen; she gives advice to a lot of people, don't misunderstand me. If she asks to see a department head, he sees her because he knows that she comes with the backing of the upper-administration. In terms of entree, she has enormous clout, but she operates through powers of persuasion.

Sherkow: That is what you meant about sitting on committees where she could have at least a vote or a say?

Kistiakowsky: Yes.

Sherkow: She does not have that?

Kistiakowsky: Yes. She does in a sense; she talks to Wiesner and Gray, and if they agree with her assessments, they can vote the way she would vote. But, you see, they have a <u>big</u> constituency, that they can not just listen to women at MIT; they have to listen to the engineering departments, and the science departments, and the this-its and the that-its.

Sherkow: You had mentioned being on the Women's Advisory Group to Mary Rowe, in a past interview.

Kistiakowsky: Yes, I was elected by the Women's Forum to be one of three Forum representatives to the Women's Advisory Group. The way the Women's Advisory Group was set up was that the various women's groups at MIT would select representatives, and the Forum simply because it spanned MIT, was asked to submit three representatives.

I did that for a year-and-a-half, from January of the year that Mary Rowe started, through the whole next academic year.

Sherkow: I just wanted to know what kinds of issues were discussed when you talked with her.

Kistiakowsky: It was a big advisory group. This is another thing the Women's Forum had said; there should be an advisory group to--my memory is beginning to come back. I guess after the administration said, "It will be only one woman, one office," then we said, "There had better be a big advisory group to give her the necessary background because if she does not have the staffing to get it for herself, she is going to have to get it somehow." I think that is what WAG--Women's Advisory Group--came out of. WAG did not get set up and did not get set up; the Forum wrote letters reminding the administration that WAG was supposed to get set up. Then, finally, it did. Forum had suggested a way of constituting a committee that would have been a much smaller, much more activist kind of committee. But as it ended up, it was representation from anything that chose to call itself a "women's group", with the result it was really very big and rather undirected. We even had one lady who represented the "right-to-life" movement; she did not last for more than about four meetings of WAG because she found herself so totally in disagreement with everybody else that she quit. I am sorry she quit; she might have learned something if she had stayed.

Sherkow: Yes. But what did you discuss? Was it just a broad range of issues?

Kistiakowsky: The first n meetings, we essentially went around the table, told each other who we were, and what our groups were doing. Out of this, a few issues surfaced, but it really was not very issue-oriented. The spring of the second year, we started getting to some issues. One of the reasons, in my opinion, was that the participation had dropped very much, so, instead of having enormous meetings, we had somewhat more reasonably-sized meetings. I forget what we did--but we did do things like write letters to the administration on specific topics, making recommendations. I believe last year, when I no longer was on it because I declined to run again as a representative from the Forum--I think one of the things one should have is rotation of membership in committees like that; I think the idea that somebody should be on it because they can get elected, because their name is known, is wrong. Unfortunately, everybody does not agree with me; oh, I do not know if it is unfortunate, but there are people who do not agree with me. But, in any case, I believe that last winter, they continued to be much more issue-oriented, and much less discursive.

Sherkow: That was when you were not involved?

Kistiakowsky: That was when I no longer was involved. We actually got off a couple of letters that last spring.

Sherkow: What kind of success, or lack of it, did you have with these letters?

Kistiakowsky: You are embarrassing me to tears. I even wrote one of the letters, and I can not remember what it was about. I would have to look it up; I really do not know. My memory of both of the letters were that they were not telling the administration anything it

did not know, but just, essentially adding the weight of the Women's Advisory Group, I know, interacted with the problem in the Athletics Department last Winter; Mary-Lou Sayles, who is the Assistant Professor of Athletics, as you know, was told her contract would not be renewed. I understand that the Women's Forum was active in urging the administration to look into this very carefully.

Sherkow: What was the outcome of that?

Kistiakowsky: She was told that it would be reviewed by a committee--not a departmental committee, but an interdepartmental committee, which is a very unusual step. The administration looked into the case, and, I guess, decided that the Athletics Department did not have grounds for not renewing her contract, and therefore set up an interdepartmental committee. In essence, it was a slap in the face of the Athletics Department. It is very unusual because usually they just support the departmental decision. The one thing that did happen was that an Ad-Hoc Committee on Women's Athletics at MIT was set up by Carola Eisenberg, and I worked on that; we wrote a report on women's athletics at MIT that we sent in to the administration the end of last spring.

Sherkow: Did Mary-Lou Sayles get her job back?

Kistiakowsky: She has a job for next year. You are not told in the winter that you will not have a job next fall; you are told in the winter that you will not have a job a year from next fall. What will be decided by this committee-which may already have decided, I just do not know what is the situation on that--whether she should have her contract renewed or not. It is a very complicated issue. When she was hired, she was called, "Director of Women's Athletics," and she took it

seriously. In my opinion, it is the fact that she really tried to be a director of women's athletics, and she tried to support women's athletics against an establishment that had for many years been devoted to men's athletics, and perhaps did it in a somewhat less then tactful way at times--she got frustrated, I would guess, and let people know that she was frustrated--that led to her contract not being renewed. But the Committee on Women's Athletics urged that there be an Associate Director in the Athletic Department with responsiblity for the Women's Athletics Program. My understanding of the reaction our report got was that, in fact, there would be a job like this, and that Mary-Lou Sayles could be considered for that job; she would be considered on an equal footing with other people. Now, she is at a disadvantage because she is young, and they could say [that] they want somebody older and more experienced, and so on. But there is nobody who has had the experience at MIT that she has had.

Sherkow: So she would be the best qualified?

Kistiakowsky: I do not know if she would be "best-qualified," but she certainly has unique qualifications. She also has the disqualification that the Head of the Athletics Department tried to let her go and therefore presumably would not be very happy having her as an Associate Head of the Department, or whatever it is called.

Sherkow: You mentioned earlier that you were in a group called the Federation of Organizations of Professional Women.

Kistiakowsky: I am a member of that as an individual. Most of the members of the Federation are organizations. I am in it as a member of WISE, I am in it as a member of the American Physical Society, and

I am in it through a number of connections. I think AWIS is also a member of the Federation. But I have also taken out an individual membership; I do not know what they call it, Associate Membership or something like that, which means I send them money, and I get all the mail which I would not, since I am not a president of anything else. I am a member of an awful lot of women's organizations at this point.

Sherkow: But you do not have an active role in all of them?

Kistiakowsky: The only one that I have an active role in at the present time is AWIS; I am a member of the Council of AWIS.

Sherkow: That had been another one of my questions because I had just discovered that in looking at one of their recent issues.

Kistiakowsky: Yes. It is a recent job; I was just elected--I just became a member of the Council last January, I guess. I have not done anything, except had my name on the letterhead. I have gotten mail, and I have responded to it, but I have not done anything, which is, I guess, why I had not mentioned it because I do not view it as something I have contributed to very much.

Sherkow: What does the position as councillor entail?

Kistiakowsky: It entails getting mail on various subjects, and giving my opinion on them, if I choose and not giving my opinion on them, if I do not choose. The subjects vary from such things as reading the proofs of the next issue of the newsletter, to supplying names for various positions. And I have been asked to comment on a letter that was going to be sent, I guess to HEW, on some lack of affirmative action on their part.

Sherkow: It does not sound like the level of your involvement in this group will be as intensive as some of the past groups.

Kistiakowsky: No. It will not. As a matter of fact, that is why I agreed to run. It was presented to me as, as much work as I wanted to do, from "zero" to "not very much."

Sherkow: That makes it more clear. What is the level of your involvement in WEAL in the National Women's Political Caucus?

Kistiakowsky: I pay them dues, and I read the stuff they send me.

Sherkow: That is it?

Kistiakowsky: Occasionally I get a phone call from WEAL asking me for information on something-or-other, and I give it to them. Same thing with NOW. I believe I am still a member of NOW.

Sherkow: You also talked quite a bit about the year where you were a Carnegie Fellow, and you were involved in the program, "Women and Career Options." I was wondering if you did any more than being involved in these luncheons? You had mentioned that you were supposed to be available to women at MIT.

Kistiakowsky: Dotty Bowe, who was my associate, in that she was in it first with Millie, Sheila, and Molly Potter, and then the next year, when I was the Fellow, she was in it with me. She did what you might call the statistical end, as far as MIT was concerned. There were questionnaires that MIT was asked to supply the answers to, and she took care of that. She also took care of getting out material for the periodic newsletters that the Carnegie Program sent out, and so on.

She and I made a suggestion to the women's residences that we would supply them with speakers or panels of speakers for informal discussions of career problems; this met with a polite response but no requests for anybody to come. Our thought was rather than trying to stage formal meetings somewhere, it might be more useful to just to have one or two women professionals go in and have quiet meetings, but there were no takers.

Sherkow: Why do you think that was?

Kistiakowsky: I think there is a good deal of going on for women at MIT as it is, was part of it. The other part of it is that women students very frequently feel they have it made; they really know where they are going, and they do not want to listen to some older women who made mistakes that they will never make. I may be being a little bit facetious here.

Sherkow: I do not feel that way at all. I am real surprised. I would have liked to have had something like that when I was going to school.

Kistiakowsky: But the other thing that I did that year was to work on data from the National Research Council; it was actually part of what I proposed that I would do while I was a Fellow. One of the papers I wrote has just been published; it came out in the August twentieth Science. Another one, hopefully, will be published at some point.

Shekrow: Yes, I saw that.

Kistiakowsky: I do not like it. Not only did the Science editors butcher it, but my coauthor did something that makes me mad as hell.

Sherkow: What did she do?

Kistiakowsky: I said that some things in the version that she sent me were incorrect, and they should be changed; instead of arguing with me and really coming to some agreement on what should be in the paper, she just did not make the changes. So, in fact, there is one statement that is dead wrong, and it is the one that is being quoted all over the place.

Sherkow: Which one is that?

Kistiakowsky: That "...men do best at an all-male institution."

Sherkow: Right. There was something in the MIT Tech Talk about that.

Kistiakowsky: Yes. That is wrong; that is dead wrong! It is the coeducational colleges that have done spectacularly well in sending men on to graduate school, and it is the state universities that have churned out the biggest numbers of men. Amherst hasn't done terribly well; Dartmouth hasn't done very well; Harvard for all its glamour and glory has made many more lawyers, and businessmen, and doctors, than it's made Ph.D.'s. It's an incorrect statement! But that woman is just so hipped on her private theory that she's not willing to look at the data and accept the world as it really is.

Sherkow: What do you think you're going to do about that?

Kistiakowsky: I told her what I thought of her, and that's all I'm going to do. If I write Science and say, "It's wrong," I'll look like a fool because I'm on it as a coauthor.

Sherkow: Did she have any kind of decision-making power? That she

could just decide to not [publish the results]?

Kistiakowsky: No, she didn't. She took advantage of the fact that she was the last one to see the manuscript before it got published. She had no power.

Sherkow: How come she was involved in the first place?

Kistiakowsky: Because she was a coauthor; we wrote it together. She lives in Washington, and I live in Cambridge; so she was the last one to see the manuscript before the final manuscript went to Science.

Sherkow: It's almost like a complete waste of time in a way.

Kistiakowsky: Oh, no. There's so much in that paper besides that one statement. It's enormously irritating because it's wrong, but anybody who asks me, I shall explain that it's wrong, and why it's in there.

Sherkow: Have you thought about writing a letter to the editor of Tech Talk?

Kistiakowsky: No.

Sherkow: No.

Kistiakowsky: It's airing dirty laundry, okay? That's what it is.

Sherkow: In the future, would you--

Kistiakowsky: I'd never collaborate with that woman again.

Sherkow: That particular person.

Kistiakowsky: Yes. Thank you for "that particular person;" that's better than "that woman". But there are men I would say the same thing about.

Sherkow: I just had had the original paper; I didn't actually look at the Science article.

Kistiakowsky: It's different.

Sherkow: I didn't realize it was different.

Kistiakowsky: Part of it's different because Science didn't want to publish all the tables, so the format of the tables had to be changed, which I think makes it a much poorer article than the original. But they also wanted it shortened, so the text had to be changed. And they also wanted it popularized, so that was another thing that had to be changed; all the discussion of the data analysis has disappeared. It was in the course of that that this crept in.

Sherkow: In your resumé, it was listed that you proposed and you were the chairwoman of the conference on "Women in Science and Technology," which was a National Academy of Science and National Research Council joint venture. Could you talk about why you proposed this, and what actually came out of it?

Kistiakowsky: I have to get a name out of my memory. I was aware of the fact that the National Academy is very discriminatory in who it appoints to its membership; there are very few woman who are Academy members. It's not really that they discriminate against women; it's that they discriminate against people who are not members of certain institutions. If you're a man at an unknown institution, then you're as much discriminated against as [a woman].--But also, if you're a research associate, you don't become an Academy member. There have been very few women who are professors at Harvard, and Yale, and what have you.

So I had been aware of the Academy as a very discriminatory organization on that score. Then Julia Apter--that's the name I was looking for--who is one of the prime movers in AWIS, and who also has been working in the IEEE Committee on Women,--she's quite a remarkable person: she's an M.D. and also an electrical engineer. She had written the National Research Council, which is the administrative branch of the Academy, pointing out that the committees that were set up to write reports--which are set up through the National Research Council, but they write reports to the Academy--had a very low representation of women, and that something should be done. She had sent me this correspondence, and this spurred me into writing the president of the Academy. I know the Academy because my father was vice-president of the Academy for many years, so I know it through his contact with it. So I wrote the president and suggested that there should be a conference set up to study the problems of representation of women on the committees set up by the National Research Council and membership in the Academy. That was, in fact, granted, and there was this two-day conference on "Women in Science and Technology."

We submitted a report and recommendations, and, I must say, nothing much happened. That isn't quite fair. I must be careful to be very fair. One thing that happened was that essentially eight months after we submitted our report and recommendations, I was invited to chair a committee that would advise the Academy and the National Research Council on selection of women for the committees. But we had already given the advice: "Get some women." We had given them lists of names, and they said they couldn't use them because they weren't selective enough. So, about the time that I was made this offer--I had been thinking about the problem, and I had submitted another proposal for

them, which was essentially how you would set up an administrative entity that would make sure that you had some good women to suggest for various committees, which would have been an expensive thing. It would not have been a low-cost committee giving advice; it would have been an office with access to a computer. They turned down my proposal. The two things crossed in the mail. It wasn't that they turned down my proposal and then offered me the chairmanship. I turned down their chairmanship; so that ended that. They also set up another committee that was going tostudy education and employment of women in science and technology.

Sherkow: You've mentioned that.

Kistiakowsky: Yes. That was set up with Lilly Hornig in the chair. But they, in my opinion, haven't done terribly well in appointing women to committees since then. They've appointed the few well-known women. They've done somewhat better in getting more women as Academy members, but not spectacularly better. They have taken every woman who could possibly look reasonably like a man already on the Academy and appointed, but they haven't <u>really</u> broadened their base all that much. If you heard somebody at the Academy talk about it, they would say something a little bit different.

Sherkow: "...look like a man" in what way? You don't mean looks?

Kistiakowsky: No.

...[Tape ran out]...

MIT ORAL HISTORY PROGRAM

Project on Women as Scientists and Engineers

Interview with Vera Kistiakowsky by Shirlee Sherkow

Cambridge, Mass. (MIT) September 1, 1976

Session 6 transcribed by Beth Gould

Sherkow: Today is September first, and this is the sixth session with Vera Kistiakowsky, and we're at MIT. During our last session, one of the answers that you had given was cut off. We were discussing the National Academy of Sciences, and you felt that they had not really broadened their base in terms of accepting women. You mentioned, also, that they were accepting women who "looked like men," and I was asking for an explanation of that, and it was completely cut off.

Kistiakowsky: Right. What I meant was that they were taking women who were in the same kinds of positions as men and had very much the same credentials as men. You might say that this is a perfectly reasonable and non-discriminatory thing to do. Unfortunately, the bulk of the women scientists, no matter how well-qualified, don't tend to be professors at Harvard and similar places, which is where the Academy tends to draw most of its people from. Therefore, if you really want to broaden your base with respect to women, you have to broaden it on the basis of individual criteria rather than institution affiliation.

Sherkow: I was also listening to the tape of the American Physical

Society Committee on Women in Physics Program in February, 1976, in New York. It was entitled, "Career Profiles of Women in Physics: Tunneling Through the Sex Barrier." And you were a--

Kistiakowsky: Voice from the audience.

Sherkow: I was really interested in this one part: it began with a question from a man in the audience about admission of women to graduate schools, and if they should be accepted under the same criteria as men are accepted. I could not hear your response at all. It went on for quite awhile. They didn't tape that very good. So I was wondering if you could just talk about it.

Kistiakowsky: Try and reconstruct it? Yes. That's sort of hard to reconstruct it. I can say what my opinion is. I think women and men should be admitted under the same criteria. The reason I say it is I think if you use sensible criteria, you will get all the good women who can benefit from a graduate school education. But the key word is "sensible". Admission to anything tends to have a rather large subjective component, and if part of the subjective component is geared to a male image, then that does tend to wipe out the women on the basis of the criteria you're using. So I think the emphasis shouldn't be on making special maneuvers so that you get more women; the emphasis should be on re-examining criteria to see whether, in fact, they have anything to do with what you're trying to achieve. Once you had determined what really is necessary as a criterion for somebody who will be a good graduate student, in the sense that they will benefit from graduate study, and that they will be successful at getting a degree, and that the professor will benefit from having them as students--the whole works; once you've worked this out, then you should apply it in a fairly

even-handed way. But, you know, I think it's death if a woman is admitted by a special dispensation even though she isn't as good, and everybody knows that she's a special case like that. Unless there's a special program coupled with it to help her make up the supposed deficiencies, I think that's a very bad way of going about it.

Sherkow: Some of the responses of the other people that were on the panel seemed to indicate that they felt that they were inadequately prepared, and if they had been judged on the same criteria as men, they might not have gotten in.

Kistiakowsky: If they're really inadequately prepared, then they shouldn't be admitted. The idea of admitting somebody who's inadequately prepared, and then expecting them to take a qualifying exam in two years is crazy. In that case, you counsel the woman to go and become a special student and make very sure that she's adquately prepared so she'll pass that qualifying exam when she comes to it. Or you have to have a special program, a program that says that the student gets an extra year to study before they take the qualifying. We have a special program for minority students in the Physics Department at MIT. And it's not for all minority students; it's for those minority students who have an inadequate academic background to be admitted under normal criteria, but who come very highly recommended in terms of get-up-and-go, and intelligence, and eagerness to be in physics, and all of that. They're given this extra year to make up deficiencies, and that makes some sense.

Sherkow: Do you have similar programs for women?

Kistiakowsky: No. Because if you look at the spectrum of women applying

to MIT, the spectrum isn't different from that for men. I've watched this now for three years, and you have women--they're very few, so you get large statistical fluctuations, sometimes, but within the statistics, the spectrum of women is the same as that for men. You get some women from first-class institutions, with first-class grades, and first-class recommendations. Not this spring, but the year previous to that, I think two of our very top students were women. This year, I think that wasn't true, but I think in the next level, not the first ten or so, but in the next level down, say the next ten, we again had a couple of women. Since the percentage of women is small, this is a statistical fluctuation; you can't claim that you should have two very good ones in that top bracket every year because two out of ten is twenty percent, and the percentage of women applying is six percent.

Sherkow: How did the man in the audience react to your suggestion?

Kistiakowsky: He felt it wouldn't solve the problem that he had, which was to come up with a lot of women. But the reason that I reacted rather negatively to him was my, perhaps unfair, perception that he was more concerned with his problem than he was with the women. I just had the feeling he was saying, "Affirmative action has handed me this problem. What the heck am I supposed to do with it?" There are a lot of things you can do to get women in science, but admitting people to graduate school who will have a miserable time isn't one of them. What you do is to go down to a lower level and encourage people to consider a career in science. When they're undergraduates, try and point out all the benefits of a career in science, including the opportunity to work as a bartender when you have a Ph.D. in physics. Try and sell them on getting an adequate preparation. Or you can do--for the third time, I'll say it again--You can set up a special program, but then

it has to be very deliberately as sort of a head-start program to get more women into science. At least that's my opinion.

Sherkow: It seemed like it was a debate--

Kistiakowsky: Yes.

Sherkow: Of sorts, and he did feel that women simply were not on the same level as men.

Kistiakowsky: That's not quite fair. His problem was getting more women. I'm sure that he has had sort of the canonical six percent applying, but what he wanted was more. And how do you do it? I don't think you do it at that level. You can't all of a sudden create people who know science and mathematics by admitting them to graduate school. You can create it by special programs. You can create it by going back a few years earlier and making sure that you generate those people. Nothing is worse than admitting somebody, man or woman, minority or non-minority, who just has a miserable time, works very hard, and unsuccessfully.

Sherkow: Do you feel that this has happened with some of the affirmative action programs?

Kistiakowsky: I know a few people who have been caught in this kind of a situation, yes. I don't have any kind of statistical information, so I can't reply in a general term. But it's a real personal tragedy if somebody goes beating their head against a wall. Being a graduate student is hard enough without starting out with that kind of a handicap of having to make a whole bunch of undergraduate work that everybody else has finished, which you have to know to take the graduate courses on which you're going to be examined.

Sherkow: How do you feel about having special programs?

Kistiakowsky: It's fine. I have no objection to it at all. I do think that the only way you get people interested in something is by having role models, or prototypes, or whatever you want to call them, and if the way to get this going is to prime the pump by a special program, then by all means, do it.

Sherkow: I'd like to go on to something else because I don't know how much time we really have. You did discuss, on various previous sessions, the three months that you were in Russia. I discovered that that was a fellowship--Scientific Exchange Program of the AEC--that enabled you to be--

Kistiakowsky: It's not a fellowship.

Sherkow: Oh, it was listed that way here-- "etcetera".

Kistiakowsky: Yes. Didn't I tell you how that came about?

Sherkow: I was racking my brain to find out if you had, and I didn't think that you had.

Kistiakowsky: Okay. That exchange between the United States Atomic Energy Commission and the USSR Atomic Energy Commission was set up a couple of years prior to this visit. It was a specific one-for-one exchange agreement; they can send one scientist to this country for six months, if we send one scientist to the USSR for six months. They wanted to sent two scientists for three months to the Cambridge Electron Accelerator because they were building in Erevan, in Armenia, an electron accelerator that was almost a carbon copy of the one in

Cambridge. So they wanted to send two of their people to Cambridge, to work here. The problem was getting somebody from CEA to Erevan because all that existed in Erevan was an accelerator under construction, and not much of anything else. There was no single person at CEA who was willing to go and spend six months in Erevan. I don't know whether Gerry suggested it, or somebody at the lab suggested it, but somehow the idea was broached that Gerry and I should go for three months, and we would each count as a scientist. Now, I wasn't working at CEA.

Sherkow: But your husband was?

Kistiakowsky: But my husband was. What actually happened, after we agreed to do it, I was made an honorary member of CEA for those three months. The USSR people sort of closed their eyes to the fact that I was a ringer, and he and I went as the CEA exchange for the two people who came here. It worked simply because the USSR was very interested in having their scientists come here. Our government didn't care. So that's the auspices.

I went purely and simply out of curiosity, if you like; I had never been in the Soviet Union, and I was interested in going. So I said, "Yes." But it was, as I may have said, before, very difficult because my children were quite small. Once I said, "Yes," I developed profound worries at going off and leaving them, and so it was complicated by that.

Sherkow: What did you do while you were there?

Kistiakowsky: Well, we spent two and a half months in Erevan, roughly speaking--maybe a little less than two and a half months--working with

Akop Aleksanian on wide-gap spark chambers. It was a very primitive laboratory with no decent oscilloscopes, hard to get a screw driver, the accelerator was mainly a big, dusty hole in the ground. In terms of meeting people, seeing a different country, it was an interesting experience. In terms of physics, it was a great, big, fat zero.

Sherkow: Had you expected it to be much of anything, in terms of physics?

Kistiakowksy: Yes. They are the people who started the work on the wide-gap spark chambers, and the streamer chambers, and we had hoped that, in fact, one would be able to do something interesting with these devices. I mean, the people in Erevan, and the people in Georgia, in Tbilisi, were the people who really pioneered these devices. So, in principle, it could have been interesting. But we did not work with the people who had done the pioneering. Aleksanian is--I think--and this is something I've deduced; it's not something I know as a fact--a politically "safe" person, and that's why we worked with him. He is a physicist, but he's not one of the outstanding ones there. But I think the reason we worked with him, rather than Tina [Levanovna] Asatiani, who is a first-rank scientist, and who won the Lenin Prize for wide-gap spark chambers, as a matter of fact, together with some other people, was simply because it didn't hurt this guy to associate with us for two months, but for anybody else it might have been politically bad. We were shut up in a hotel for more than a month, even though they had said [that] they would get us an apartment. The, finally, we were able to move into an apartment when they had completed a new building, and we were the only people in that building.

Sherkow: What were they afraid of?

Kistiakowsky: We might contaminate the natives, I guess [laughs]. Our social contacts were very restricted. We did have some, but they were very restricted. Aleksanian didn't have a very--He's a nice guy; I like him personally. So this isn't a criticism. But he was given a very hard task, with very primitive kind of methods to get a small experiment going in very little time, and it just didn't work very well.

Sherkow: What did you do when you came back from the three months?

Kistiakowsky: I had a small vacation with my children. Then I went back to work at MIT. That temporary connection with CEA was just that, a temporary connection with CEA.

Sherkow: Just about five or ten minutes ago, you mentioned female role models. I don't think we've really talked about the importance or lack of importance of them. I was wondering if you would discuss your feelings about female role models?

Kistiakowsky: Yes. I think they are important, not necessarily in terms of direct contact, but in terms of knowing that other women are doing the kinds of things you're doing on it. I went, as you know, to Mt. Holyoke College, and it was a very good choice on a couple of scores. First of all, I was very young, and it was a very protected environment, and at that time it really was a good thing. The other thing was that it had a lot of female professors, including several in the Chemistry Department, of whom my father had a good opinion. I went there knowing he had a good opinion, and I observed that they were doing research, and enjoying it, and just generally having a very useful and apparently fulfilled existence. I really did

not leave college feeling that becoming a scientist was completely weird. It was clear it was somewhat weird, because, as I've said, of my class of three hundred and fifty girls, I estimate that three hundred and forty were engaged by the time they graduated . [laughs]; I exaggerate that, it's unfair. But those that weren't engaged were wishing that they were; not quite to a girl, but the overwhelming majority felt that that was really the only thing that they wanted to do.

But I did this counter-example, and I think it is something that was very important. I can't do the experiment of going to college somewhere where there were no women and seeing what happened. Certainly for most of the students at Mt. Holyoke, it didn't make any difference because they went on and got married and did what they were going to do anyway. But I think it <u>is</u> supportive if you have a career orientation to realize that it's a "doable" kind of thing.

Now the other side of it is that an awful lot has been made of it, and there are some women students who react rather negatively to having career models thrust at them. A woman, for example, who comes to MIT has a tendency to feel that she's rather unusual. Anybody who comes to MIT as an undergraduate is somewhat unusual; they are in the top of their class, and they've taken a lot of math and chemistry and physics. So they are different form most high school students in the United States. If you're a woman, it's sort of compounded, because a smaller percentage of women do this than is true for men. Some of the women feeling unusual, feel a little bit queer, and are reassured by the fact that there're female faculty types who have a reasonable existence doing this kind of thing. Some don't feel queer at all; they just feel that they are exceptional, and they're not

all interested in the fact that there're other people who have done it, too; they are quite happy with being exceptional. So it varies from student to student.

But I think even for those who reject it, who prefer to feel exceptional, in the end, it probably is a good thing to have seen other women working at a career like this, and managing whatever goes into it. The only thing that really bothers me about career models these days: They always seem to push the married woman with kids. It isn't clear to me that you've got to get married and have kids to have a happy and fulfilled life. I think there's a little bit of oversell on that end. I'm sure there are people who would be happier not getting married, or not having kids, and they shouldn't be talked into it the way that so many people in my generation were. Because it's harder, it is much harder to do both things than to do any one of them.

Sherkow: Are you talking about the media kind of pushing that image of the woman scientist who also has a family and kids?

Kistiakowsky: Oh, yes. Whenever you run a session somewhere where you have successful women scientists speaking about their careers, there tend to be people who tell how they can raise sixteen kids and get a Nobel prize at the same time. You'll forgive me for exaggerating.

Sherkow: No, that was my feeling on hearing the tape at this committee meeting that I had mentioned to you--the one in February in New York. It seemed that each woman had an obstacle of one type or another. They were asked, "What kind of supports did you have?" They all said,

"Well, my husband was just a wonderful support." I didn't see any room for any kind of single women. There were no single women on the panel.

Kistiakowsky: Well, the obstacles usually are connected with marriage.

Sherkow: I guess that's why they mentioned it, then.

Kistiakowsky: Yes. There are obstacles that are not marriage-connected, but then there're usually not the kind of things that a husband can help you with.

Sherkow: But the existence of a female scientist as a role model who is single does not seem to be too evident, from what I've been reading.

Kistiakowsky: Yes. There are successful, single women scientists, but here I do not know the statistics. The married women do tend to be more successful, speaking statistically. Now why that is, I don't know. It may be that the people who are capable of coping with both things have more get-up-and-go, and therefore they're more successful. It may be that there's interaction between husband and wife; I really don't know.

Sherkow: One of the things that was brought up at this same session that I keep mentioning: Glennys Farrar was one who discussed it. She got married quite young, when she was an undergraduate, and she felt that the men interacted with her quite differently once she got married; suddenly they weren't threatened by her anymore because she was sort of de-sexed as a married woman. Before that, just discussing problems in science was difficult, and having the sort of natural arguments was difficult.

Kistiakowsky: I've never had that experience. For one thing, I went to an undergraduate college where there were no men. So on the undergraduate level, I had no interaction with men concerning science. The first couple of years I was in graduate school, I wasn't married, and I had no problems interacting with male graduate students. But I think I was rather direct about not being interested in being considered as a woman. I don't know.

Sherkow: That was just a possibility.

Kistiakowsky: Yes. No. It's always puzzled me a little bit because there are people who, apparently, have a <u>great</u> deal of trouble with their male colleagues in terms of passes, and inappropriate remarks, and so forth, and so on. Or they have trouble with technicians or something. I don't. I don't think it's any expertise in handling people. Quite the contrary; I don't think this is something where I excet ~~al~~ all. But I think I must just project a rather fierce image on the subject of being treated as a sex object. I don't know.

Sherkow: Maybe you have to be a different kind of a person to be successful as a single woman scientist.

Kistiakowsky: I am a single woman scientist.

Sherkow: Right.

Kistiakowsky: And I have been since 1965. Except I'm not quite, because I have two children. But it certainly didn't all of a sudden increase my popularity as a woman to have become separated. My social life did not increase; it decreased. That's something we went

through once before. There was no private social life that occurred. The fact I was separated from my husband did not lead to any individual encounters--dates, or whatever you want to call it. I don't even know the language [laughs].

Sherkow: [laughs]. At the various places that you've worked, have women been in prominent positions as scientists?

Kistiakowsky: At Berkeley, no. At the University of Columbia, yes. There's another role model for you: Chien-Shiung Wu. Brandeis had its share of women professors but none in the sciences. And MIT, when I came here, I was not aware of any women professors except Emily Wick. It wasn't until the Women's Forum got going that I really met Millie Dresselhaus, although she had become a professor some years before that; I wasn't aware of this fact until the Women's Forum got going, really. I think when I came, Emily was the only woman on the faculty at MIT. No, I take it back: Krystina Pomorska in Slavic Languages.

Sherkow: How did you feel about that, being in a minority, more or less?

Kistiakowsky: At that time, my consciousness wasn't raised, and I was used to being in a minority. In a sense, Columbia was an exception to the usual situation.

Sherkow: How did you feel about the situation at Columbia then?

Kistiakowksy: The year that I worked for Professor Wu was difficult because of the fact that she is a very demanding person to work for, and I am not very good at doing what I'm told; I have a tendency to

do what I think is correct--or is better. So it was all right; there wasn't any open friction or anything, but it was clear to me that it was not something that I wanted to continue to do. She was very good in supporting me in my efforts to become independent. I mean, she wasn't at all holding on to me as a person who was responsible to her. I worked up an experimental proposal, and on the basis of that, I did become an independent experimental entity at Columbia. She could have spiked that; she was in a position where she really could have prevented that if she had wanted to, and she didn't. Now, it may have been that she decided having a reluctant employee just wasn't worth it. But I don't think so. I think it was just that she is a very honorable person. But she has a reputation for being very hard on her graduate students and the people who work for her; hard in the sense of very demanding in terms of time put in, and level of performance, and that kind of thing. But that would have been the same whether she was a man or a woman. The fact she was a woman really didn't enter into it.

Sherkow: You've discussed affirmative action at MIT to a certain extent. But could you make some kind of a summarizing statement of MIT's commitment to getting more women at every level, from undergraduates, to professors, to administrators, and people at the highest levels of research?

Kistiakowsky: Yes. I think MIT's commitment in terms of the upper level administration is a very genuine one. However, it is not important enough to the upper level of administration to drastically change the way that MIT is run, meaning that they are willing to do everything to achieve this short of going into a recalcitrant

department and telling them how to run their business. They use all forms of direct and indirect persuasion, but not going in and saying, "You must do this, and this, and this, and this." So that's sort of general. Some of the departments are very good; most of them are not very good; some of them are awful.

In terms of the undergraduate students, there has been an enormous increase in the percentage of women coming to MIT. This is partly because of the administration policy, and it's partly because the women students who were here were willing to put in an awful lot of effort into things like writing a booklet on women at MIT, which was their idea and would not have been done if they hadn't been pushing it that way, and writing letters to women who are accepted to MIT, encouraging them to come and offering to answer questions. So there has been a big increase, but partly because of the efforts of the women, themselves.

At the graduate student level, in certain areas, like the Sloan School, there have been very great changes; in other areas, like physics, there's been a small increase, but not really a very great change. The problem there is the one that we were really talking about earlier: there's not an awful lot you can do at that level; you have a group of people who apply, and there's not an awful lot that you can do. Hopefully, what's being done at the lower levels will increase the sources, so that in the future there'll be more.

In terms of scientific staff, that's pretty uncontrolled, and it varies very much what happens. There aren't very many women engineers and scientists, so it's very easy to claim, "I looked, and there weren't any." One doesn't know how true these statements always are.

In terms of faculty, it just varies enormously. But overall, MIT has done very well because last year there were fifty-nine women assistant, associate, and full professors at MIT out of a total vaculty of about nine hundred people. When you calculate what you would expect, given that you have so many faculty who are engineers, so many faculty who are scientists, so many faculty who are humanities, and so on, you get a projected number of women that isn't very much bigger than the fifty-nine. So in that sense, MIT does much better than a place like Harvard, where if you did the same calculation, you would have found that they fell way short, simply because they do have fairly large faculties in areas where there are quite a number of women at the appropriate degree level. However, there are some departments at MIT that should, statistically speaking, have women that don't.

Sherkow: In the sciences?

Kistiakowsky: Yes. Mathematics has no women. Their official position has gone from the statement that there are no women qualified to be professors at MIT, to, "We are looking for women to be qualified to be professors at MIT." How long they continue looking is an interesting question.

Sherkow: Do you think the fact that MIT doesn't force anybody to do anything could be bad in terms of those kinds of departments?

Kistiakowsky: When I say something like this to the people on the upper level administration, that they don't do anything, they would reply, "They do a lot to departments like mathematics." When mathematics hands in its request to hire, say, four young men as

assistant professors in various branches of mathematics, the committee that oversees this says, "You can't, because you haven't done an appropriate search to see whether there aren't women." So, it gets sent back to mathematics, and they have to go and do an appropriate search. Then, after they've documented the fact that there aren't any women, then they get the appointment. So life has been made very difficult and unpleasant for mathematics. But you can play the statistical game to make sure that you define the problem so there are no women, or there are very few women in the group of candidates you're considering. Mathematics could hire a woman professor instantly if they just said, "We will look for a woman who has the qualifications to make a success of being an assistant professor of mathematics at MIT." The minute they drop the statement, "I want somebody who specializes in a particular little branch of mathematics because that's the gap we need to fill this year," and really go out at it from that other point of view, I'm sure they could come up with somebody.

Sherkow: Jumping to a different subject: you wrote two books for children on science. Why did you write these books?

Kistiakowsky: The first one, I wrote because somebody at Columbia was asked to supply the text for a book on atomic energy for children, and he didn't have time to do it and asked me would I do it. Since I was pregnant at the time, it seemed like kind of an interesting idea, and an easy way to pick up five hundred dollars, which I could use.

[BEGIN TAPE ONE, SIDE TWO]

Kistiakowsky: It turned out not to be an easy way to earn five hundred dollars. It turned out to be very traumatic because they insisted on cutting my eloquent and carefully thought-out text to conform to the stringencies of space associated with the pictures that were drawn for the book. I also went to some effort to take the artist out to Brookhaven and supply him with all kinds of material, and I really was a very considerable help to that man and was somewhat dismayed to discover that it was his book, with me supplying the text.

Sherkow: He was just the illustrator?

Kistiakowsky: He was the illustrator. But, you see, he was known in children's books, and I was just somebody writing a text. So the whole thing was a bit of a pain. It wasn't as good a book as it could have been, simply because it had to be shortened to the point where it wasn't that understandable.

The second book was written when Marc was, I guess, about three.

<—It was, again I guess a maternal instinct to do something for one's children, and one of the things one can do is to supply them with information. So I wrote a book about gravity and illustrated it with my own pictures. Marc took it to the nursery school at Brandeis, and the director of the nursery school thought it was the greatest thing--not that she'd ever seen--but she thought it was very, very nice, and suggested that I get it published because she thought it was understandable for young children; that's what attracted her. One tends to glow with pride when one gets compliments like that, so I sent it off to a publisher. It eventually did get published, but not with my illustrations. Again, with illustrations by an illustrator who got a major share of the cash and the credit and who put in some

perfectly revolting pictures that I couldn't veto; I didn't have veto power over his illustrations. The text in that one stayed pretty intact; that wasn't changed very much. That actually isn't a bad book, with the exception of the pictures which I just mentioned.

Sherkow: Do you think you might do this again?

Kistiakowksy: I doubt it. My children are sort of out of that stage, and that was the main motivation, really, I think, for doing both of those.

Sherkow: They both read them and used them?

Kistiakowksy: Not all that much, no.

Sherkow: We've talked a lot about the different work that you've done in terms of women's issues. But we've never really discussed when, how, and why you actually got involved in what I'm going to call, "the women's right's movement."

Kistiakowsky: I was fond of saying that it all started with reading The Feminine Mystique in 1968, or sometime like that--I didn't read it when it first came out; I read it several years afterwards--and saying, "That's what happened. That was it. She got it right every time. That was my generation." Which, in fact, is true. But I have met a couple of people to whom I've said this who have said that I'm wrong, that all through my life, I had a very strong, overt feminist attitude, even if I didn't recognize it as such. In retrospect, I probably think they're right, but I wasn't very consciously feminist. It may not even have really been feminist; it may have been just purely egotistical.

Sherkow: Or individualist.

Kistiakowsky: Yes. No, no; egotistical. I mean, I am just as important as any scientist, and the fact that I am a woman doesn't mean that I am less important, or whatever. People may have translated that into a more general feminism. But when the people who were in graduate school with me quit, I was unhappy that they quit, but you can't tell a friend, "You mustn't," at that time. Because at that time, I was not entirely sure that I was right. I knew that what I thought was right for me was not what the world thought was right for women. My memory is that I thought that I was different, and I didn't care whether it was right for me or not; this is what I was going to do.

Sherkow: So do you feel that your involvement--

Kistiakowsky: It really started in about '68. I joined NOW when it formed. I worked on their Academic Tast Force for awhile; it was in connection with that that in 1971 we had the Workshop on Women in Academia, including one session on women in science.

Sherkow: Here at MIT?

Kistiakowsky: No, it was held over at Harvard, as a matter of fact. But Elizabeth Baranger, and I, and Vera Pless ran that session on women in science, and that was the origins of WISE. It was basically the response to that and also the response to my efforts to get the Women in Physics thing going, that made me realize that in science I could achieve a lot more in terms of women's rights than I could in something amorphous like NOW. The trouble with NOW was one could put in work, and put in work, and put in work, and it looked as

though nothing was happening; it was really very frustrating. Everything was done with manual labor; there was no money. There were a lot of things once could have done if one had money to pay for advertisements, or what have you. But the way they went about things was just back-breaking: stuffing envelopes, and all that kind of thing.

Sherkow: I'm not sure that you have actually said why you got involved in the women's movement around 1968.

Kistiakowsky: I don't know [laughs].

Sherkow: [laughs].

Kistiakowsky: It clearly struck a chord in me somewhere. But, you're asking what really here is a fairly deep psychological--a question that has a fairly deep psychological answer. I don't have a conscious reason. It was something that I found was very important to me; important enough so I was willing to take the time to do it. I really feel that women have been discriminated against. A lot of the problems that women have are of their own making, but not all of them. There is a substantial component of overt and covert discrimination. I've had enough of a taste of this so that it makes one somewhat more militant.

Sherkow: What are your feelings about the many speeches that you've given concerning mostly women in science?

Kistiakowsky: I enjoy giving them. I have developed into a good speaker. I think when I first gave them, I was rather stiff, and I presented them like I would present a physics paper. But, over the years, I have learned a more colloquial style, if you like. I think

it is still much more academic than many speakers. I tend to stick much closer to fact and not to go off into rhetoric as much as a lot of people who talk on these subjects. But I'm told that I do give both interesting and involving talks. Since I do it reasonably well, I enjoy doing it for that reason. There are always people who thank me for coming and sound as though they mean it, so it's rewarding in that sense. I don't know if I've answered your question; I maybe didn't really understand your question.

Sherkow: I guess why? Why you do it and what kind of effect you think it has on the people who are there?

Kistiakowsky: It depends on the group to whom I talk. When I talk to a group of predominantly women, it has an encouraging and a rallying effect, if you like. They get together because they want to hear something nice about themselves, or about other women scientists, or something like that. They want to hear whether it really is their fault that they are research associates, and all the males of their age group are full professors. So, as I say, it is an encouraging and rallying kind of thing to do. And the reason I do it is because people seem to enjoy having me come and talk; it does seem to give them pleasure, if not some kind of a concrete benefit. I really don't have a much better reason that that.

The other aspect is that I know more about this subject than most people. I really, truly have become somewhat of an expert by virtue of the fact that there aren't many people who know anything about women in science, at all. So my far from full-time consideration of the topic makes me fairly unique.

Sherkow: Did you ever experience differences in salary with co-workers who were men or women?

Kistiakowksy: No. I knew at one point that I was making less money than people at my age level, but that was when I was a senior research scientist; I was told I was making the same amount of salary as a professor at an equivalent level. But I do know that when I was made a professor, all of a sudden my salary jumped by a very large amount. But senior research scientist is one thing, and a professor is another thing; so it's not quite a fair comparison. Until I separated from my husband, money was the furthest thing that I thought about. He worried about money, but I never did. I still don't worry about it as much as I should, but I'm now more conscious of it.

Sherkow: Is that because you're supporting yourself and your children?

Kistiakowsky: That's right. He sends some money towards their support, but it's not a very large fraction of that.

Sherkow: Do you feel that there is a trend towards real positive changes for women in science?

Kistiakowsky: Yes, there's a trend. How far it will go is something else again. There's a foot in the door, or a nose under the tent, or whatever you want to say. If the foot continues to push its way in, then you will see more women, and you will see them getting more equal treatment. But it's going to be hard. There are a lot of women who are assistant professors, and whether they get tenure is something that hasn't been decided yet. It's not going to be very helpful if you keep having affirmative action to appoint women to be assistant professors if none of them ever get tenure.

Sherkow: Do you feel it's something that you have to keep working on?

Kistiakowsky: Yes.

Sherkow: You mentioned that you became more militant from being involved in the women's movement. I wanted to know, in general, how you would explain the evolution of your ideas in the women's movement over time, from when you first became interested and active.

Kistiakowksy: You're asking me something that I haven't thought about. Gee. I think what happened was that initially I just had a feeling on the basis of my personal experience, and my contact with a few other women, that my feeling that something was wrong had some basis somewhere. As I got involved in looking into the situation of women in science, I got more and more data on certain aspects of the problem that convinced me that, in fact, there was, in addition to certain traps that women fell into, there was also, certainly, evidence for some kind of discrimination at work.

It was this building up of evidence that made me more militant. Also, originally, there were certain remarks or jokes that one sort of treated as conversational, and one didn't take offense because one wasn't a good sport if one took offense at that kind of thing. I now am <u>perfectly</u> willing to take offense at <u>anything</u> that I find sexist and point out that it is, and I don't give a hoot about being a good sport anymore. It was essentially talking to really militant people in the women's movement that made me realize that I had been leaning very far over backwards in order to not be a spoilsport. It doesn't make me popular with members of the department.

Sherkow: From my experience, it's kind of hard to change. Once you've become convinced that this is the way people should treat you--

Kistiakowsky: Yes.

Sherkow: You just can't accept the same kinds of statements that you maybe could accept a couple of years ago.

Kistiakowsky: That's right. But there're people who ask me, "Don't you get tired of always being treated as a woman? Why don't you stop making these remarks that single you out as a woman?" And to call attention to a sexist remark is pointing out the fact that something is offensive to you that isn't offensive to men, and, therefore, you're singling yourself out as a woman. "Why don't you just be one of the boys?" I guess is the--And one tries to explain. Some of the people who say this are genuinely decent people, and they would be the people who would always support you or support any woman, but they feel that this kind of thing is frivolity; that it's unnecessary, and that it's harmful. It certainly isn't good for the person who does it; it does me no personal good to object to remarks that single out women. But the hope is that one can educate people so they stop doing it, and also to the fact that there's something wrong in thinking about women in that context. It may be a wrong hope; it may not work that way, I don't know.

Sherkow: But you also are a woman; you're not "one of the guys." It's not like you can say to them, "Well, why don't you be one of the girls?" They would really take offense at that, I think.

Kistiakowsky: Oh, some of the people who would object to my calling attention to what I consider a sexist remark would say, "I wouldn't mind being considered 'one of the girls'." At an intellectual level, I'm sure they're quite right; they have thought through it enough so

that intellectually they could accept it, but whether they'd accept it at a gut level is another thing again.

Sherkow: How do you feel about the way things have turned out in terms of your expectations, and where you are now: your training, your career, your family, everything?

Kistiakowsky: Well, I haven't won a Nobel prize.

Sherkow: [laughs].

Kistiakowsky: I use that as a code word for stellar success. I haven't succeeded at that level, so, if you like, I'm a failure.

Sherkow: But how do you feel about it?

Kistiakowsky: It varies; it really, truly does. In many respects, I am a very fortunate and happy human being. I do very interesting work, I get paid reasonably well, and I have evolved a relationship with my children that's very satisfying. In many respects, I'm extremely lucky. I really, truly am. I like teaching. I like doing research. A very large fraction of what I do I enjoy, and that's more than most human beings have going for them. But, there's always this element of ego, or whatever it is, that makes you want to--I don't know--achieve more. And so I haven't satisfied my ambitions, if that's the answer to your question, but whenever I look at where I am, I realize I have an awful lot to be thankful for. So I don't go around eating my fingernails because I'm not the world's greatest high energy physicist. But it would be nice to do an experiment that made a real mark on the world.

Sherkow: What do you feel are the happiest times of your career?

Kistiakowsky: That's looking at the past, and that's dangerous because you always have a very selective filter. The year that I worked on the Sarah Berliner Fellowship at Lawrence Radiation Laboratory; that was a very happy year because I really was completely on my own: I was doing an experiment that I had planned, and it was quite a carefree, and hardworking, and very pleasant year.

The years at Columbia, after I worked for Dr. Wu, where I was doing my own experiment at Brookhaven, that, again, was very much self-directed and self-paced. There were somewhat more problems with my marriage at the time, so it was somewhat complicated with that, but there were some very good times there, too. Gerry and I had a sailboat, and we went off sailing on the sailboat. So, again, it's a question of memory. But my memory is that, on the whole, those were very happy years.

The time at Brandeis was miserable; it really, truly was miserable. The first years at MIT were complicated first by the fact that I had left Brandeis, in my own eyes, a failure. I mean, I had decided to abandon Brandeis rather than make a fight of it, and that ate upon my sense of self-esteem, or whatever. I was in a subordinate position; I was a research associate again, after having been independent, and that I didn't enjoy, even though I was working for somebody who was extremely considerate of my sensibilities.

And then, of course, I separated from my husband, and there were years which really were complicated by the problems that arose from that. And so, MIT has gotten, essentially progressively better as I've gone along. And, if you like, the more independence and recognition I've got, the better it is. I basically don't like working for somebody. I guess that is what it boils down to.

Sherkow: What are the assets and capabilities of which you are the most proud?

Kistiakowsky: Gee whiz. I can use a lathe. Oh, I'm proud of the fact that I have a reasonably good athletic capability; I can ride, and ski, and that at my advanced age, I haven't fallen into decrepitude. That pleases me that I can do work around my own house and succeed at it. I'm not proud of my children, but I'm very pleased that they are such nice people; it certainly is very satisfying.

Sherkow: How about in terms of your career?

Kistiakowsky: In terms of my career? If you'll pardon something that sounds conceited--I do most things pretty well in terms of physics. So I tend to think in terms of the things that I don't do as well as others; I don't really know. I am a good physicist; I don't know what kind of adjectives you want to put on it. I can do data analysis and come up with reasonable conclusions; I can write good papers and get them published; I can plan an experiment and end up with something that is a reasonable experiment; I can supervise the building of equipment and eventually it'll work. So these are all the things that go into being an experimental physicist, and I guess I'm very proud of the fact that I can do all of them reasonably well. The thing that I'm deficient in is as a theorist. I am not a combination of experimentalist and theorist. The thing I am least proud of is my capacity for any independent approach to theory. I can read something and understand it and then use the calculations that are suggested. But in terms of initiating my ideas, that's something I'm not good at. So that's, if you like, it's the negative thing that I [feel about myself].

Sherkow: Are you doing something about that?

Kistiakowsky: No. To really do something about that, you'd have to go off and--if you have a gift for it, then you do it naturally; if you don't, then you have to go off and try and be a theorist.

Sherkow: I see.

Kistiakowsky: I don't intend to go off and try to be a theorist.

Sherkow: How about this for a last question? What are your personal goals in life? What does the future hold?

Kistiakowsky: What the future holds is at least another four years of doing essentially what I'm doing now, but hopefully, with greater autonomy. It is greater now than it was two years ago, and I'm sure it will continue to go in that direction. The possibility of coming across something that really does put a permanent mark on the physics world. What we're doing is putting marks on the physics world. I mean, it's important and exciting and new, but it's not something that's going to end up in a textbook; it will be part of a large body of knowledge that will lead to something that's in a textbook.

But it would be nice to do an experiment that will end up in a textbook; it's unlikely, but it would be nice. I don't plan on it because it's something you can't plan on. So what I plan on is doing bigger and better experiments for the immediate future. Then my children will be either through college or in college, and I will be personally a lot more independent. And, I don't know, I'll have a sabbatical coming up. I might go somewhere--I may just go somewhere and do physics for a year; I might go somewhere and do something else for a year; I don't know.

Sherkow: You mentioned the possibility, at a different interview session, of perhaps getting into administration.

Kistiakowsky: Yes, but that's still further in the future, because four years from now, I'll still be in my early fifties, and that will still give me thirteen years before I retire. To do academic administration for thirteen years doesn't appeal to me. If it were a really exciting government job, or something that really held a challenge--a long-term challenge, or would lead to something--a continuation of some things, one might consider it.

The only thing I'll say is that physicists face a problem when they retire at sixty-five, or sixty-seven, or seventy, in the sense that it's very hard to continue doing experimental physics after you're retired. Somehow before you retire, you have to figure out what you're going to do when you retire so that it's a pleasant experience, not a trauma of some kind. So at some point before I get to retirement age, I am going to figure getting into something that will lead into a productive retirement because I can't see me sitting down with a rose garden and doing nothing.

Sherkow: Are you thinking along the lines of physics?

Kistiakowsky: I haven't really thought. It might not be; one could go into academic administration, and from that end up on the board of directors of some companies, or something like that. I don't know; I suppose one could do something like buy a horse-breeding establishment, except those don't make money; one would have to find something that made money. I really haven't thought about it in any detail, except to very clearly articulate the fact for myself that one has to thing about what one does.

Some physicists do, in fact, set it up so they continue in physics. But the people who are most successful at that are the people who have been very outstanding in physics, or who have become scientific elder statesmen of some kind. So what you do, actually, is predicated to some extent on what you are at that time.

Sherkow: Right. So you can't know now until--

Kistiakowsky: You can't know now. Also the people who continue tend to be theorists not experimentalists because the theorist doesn't need the laboratory, doesn't need the big support, and all of that--the financial support.

Sherkow: Was there any point where your expectations failed to match the real situations?

Kistiakowsky: Yes, at Brandeis.

Sherkow: That's the only time?

Kistiakowsky: Yes. I did not live up to my expectations of myself. In retrospect, I can say, "It wasn't my fault, that it was an impossible situation, and all kinds of things." But, basically, you can never blame something like that on the situation; if you don't succeed, you have to say [that] it was your fault at some level, too. I'm sorry; I shouldn't say it as a generalization, but, certainly, that's the way I feel about myself.

Sherkow: I notice that it's five after three, and I could keep going on, but I don't think that that would be fair since you said you had to leave.

Kistiakowsky: Yes. Sure.

[End of Interview]