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Remarks by Prof. C.S. Wu of Columbia University at the
Symposium on American Women in Science and Engineering.

In his Welcome Address, Dr. Stratton, quoting what the great educator Mathew Vassar had said about women's education more than a hundred years ago, said that women have received from the Creator the same intellectual constitution as men and that they should have the same rights and responsibilities as men to add to the scientific and cultural progress of the world. This was the philosophy of the founders of women's education in this country more than a century ago.' I am sorry to say that we have made relatively little progress since then. What has contributed to this lack of progress?

I sincerely doubt that any open minded person really believes in the faulty notion that women have no intellectual capacity for science and technology. Nor do I believe that social and economic factors are the actual obstacles in the way of preventing women's participation in the scientific and technical field. The main stumbling block standing in the way of any progress is and always has been unimpeachable tradition. It is a "tradition" that the scientific and technical fields have always been men's fields. And, therefore, it is unfeminine for a woman to try to compete with men in a presumably man's field.

Even in the brilliant keynote speech which we have just heard from Professor Bettelheim, the Professor cannot refrain from saying that a woman is a woman. He enthusiastically cited the success story of a young Russian girl working in the engineering field, but he reminds us that the young Russian girl loves her work with a womanly embracing of her tasks rather than a masculine conquering of them. He quoted what Balzac says about a woman who has the advantages of a man's education. A woman bringing a womanly viewpoint into a field may be advantageous in some areas of education and social sciences, but not in physical and mathematical sciences where we strive always for objectivity.

I wonder whether the tiny atoms and nuclei, the mathematical symbols or the DNA molecules have any preferences for either masculine or feminine treatment?

In science and technology we dedicate ourselves to the study of nature, to the understanding of our environment, and incidentally to the betterment of our life. It is the highest form of aspiration as well as satisfaction. It is a fulfillment of human passion. If, in this human society, women are endowed with just as many intellectual capabilities as men, why then should they be deprived of such aspiration and fulfillment? Why should they not share the responsibilities (and the satisfactions) of the progress of science with men?

Of course, the qualifications of a scientist are very exacting and the task is demanding, and no one becomes a scientist after a snappy decision and hasty training. It takes long years of study and preparation to become one. If a person had neither the temperament nor the talent or lacked interest in science, he would have been discouraged and dissuaded and dropped out long before he is ready for the profession. How unfair it is to shut the door on those women who have met the challenge and come out with flying colors just because they are women!

I believe that the woman's commitment in science and technology is natural, healthy and promising. It is good for the qualified individuals and it is essential for the future of the country. In a time when we cry for the lack of manpower in science and technology, we find that women's enrollment in science remains low and women employed in the field of science are still scarce. People are reluctant to face the fact that the lack of women in science is also a terrible waste of potential talent. At this point, may I proudly present some facts to substantiate my claims. I am very proud of women's achievements in nuclear physics. It was the discovery of radioactivity by Professor and Madame Curie that made people to realize the existence of the nucleus. Madame Curie discovered and identified several chemical elements and received not one but two Nobel prizes; the first time in physics and the second time in Chemistry.

No man in history has yet been able to equal that honor and distinction. Her elder daughter, Madame Irene Curie Joliot, with her husband, again were awarded a Nobel Prize for their discovery of artificial radio-activity. We are extremely proud of Dr. Lise Meitner's achievements. She contributed greatly to our understanding of the α and γ radiations. She worked very closely with Dr. Otto Hahn on Uranium fission until circumstances forced her to leave Germany. With her nephew, Dr. Frisch, they gave the first explanation of what Hahn had observed and named the process of "nuclear fission," a word borrowed from biology. Last year, another woman physicist, Dr. Maria Mayer, was awarded the Nobel Prize in physics for her important contribution to the nuclear shell model. Never before have so few contributed so much under such trying circumstances! Why shouldn't we encourage more girls to go to science?

In order to stimulate and encourage women's commitment to science and technology, some fundamental improvements and changes in our outlook for women in science must be stressed. One is that the traditional roles of wife and mother and the role of dedicated scientist are actually compatible. The other is the professional acceptance of women scientists and engineers. Professor Bettelheim pointed out that as much as women want to be good scientists or engineers, they want first and foremost to be womanly companions of men and to be mothers. How can we agree with him any less than whole heartedly? However, this noble human desire to be devoted companions and good parents must, ideally, be equally shared by men. The social psychiatrist tells us that the most balanced and normal bringing up of children is under the parental care of both fathers and mothers. They also stress the importance of good peer group relationships. In our present society of plenty and proficiency, is it too much to provide excellent professional child care during the day so that mothers can get away from monotonous house chores and can work in their chosen field? Isn't it more satisfying for a woman to have her own intellectual endeavor along with the responsibility of home and children? Isn't it rather clear that parents who lead more meaningful lives themselves will make the time they spend with their children more meaningful

for both child and parents?

As for the professional acceptance of women scientists and engineers, the statistics do not speak very favorably for the past or the present. In a report published by the A.A.U.W. Journal in 1962, John B. Parrish of the University of Illinois compiled special statistics on "Women in Top Level Teaching and Research." The survey was based on the faculty members in ten leading high endowment and ten leading high enrollment universities. He showed that women comprise about ten percent of the faculties. However, women tend to be concentrated in the lower ranks. In the survey, 16 percent of the instructors, ten percent of the assistant and associate professors, but only five percent of the professors were women. Actually, in the physical, biological and social sciences only one percent of professors are women. The under-utilization of women in top level teaching and research in leading schools is thus severe. However, there seems to be a glimmer of hope on the horizon. Women are presently making substantial contributions at the lower ranks in virtually all fields. There is a good chance these women are today providing a solid base for the greater (and surely necessary) use of women at the highest levels tomorrow.