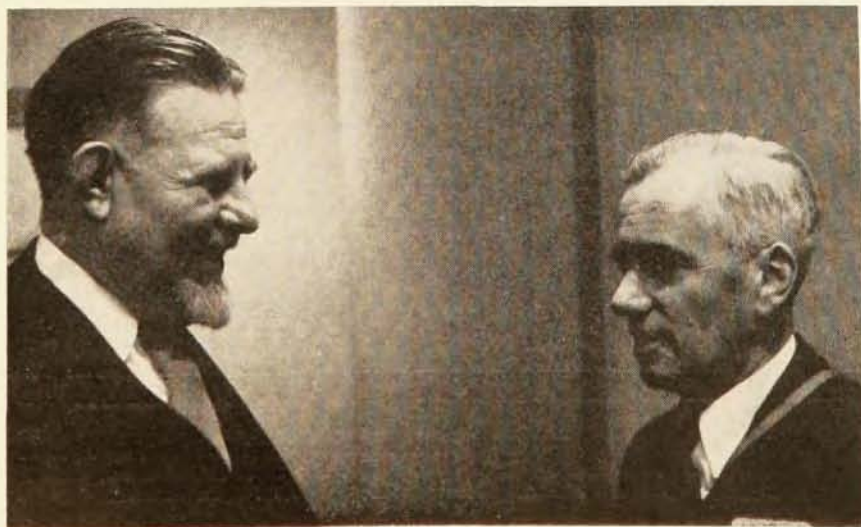
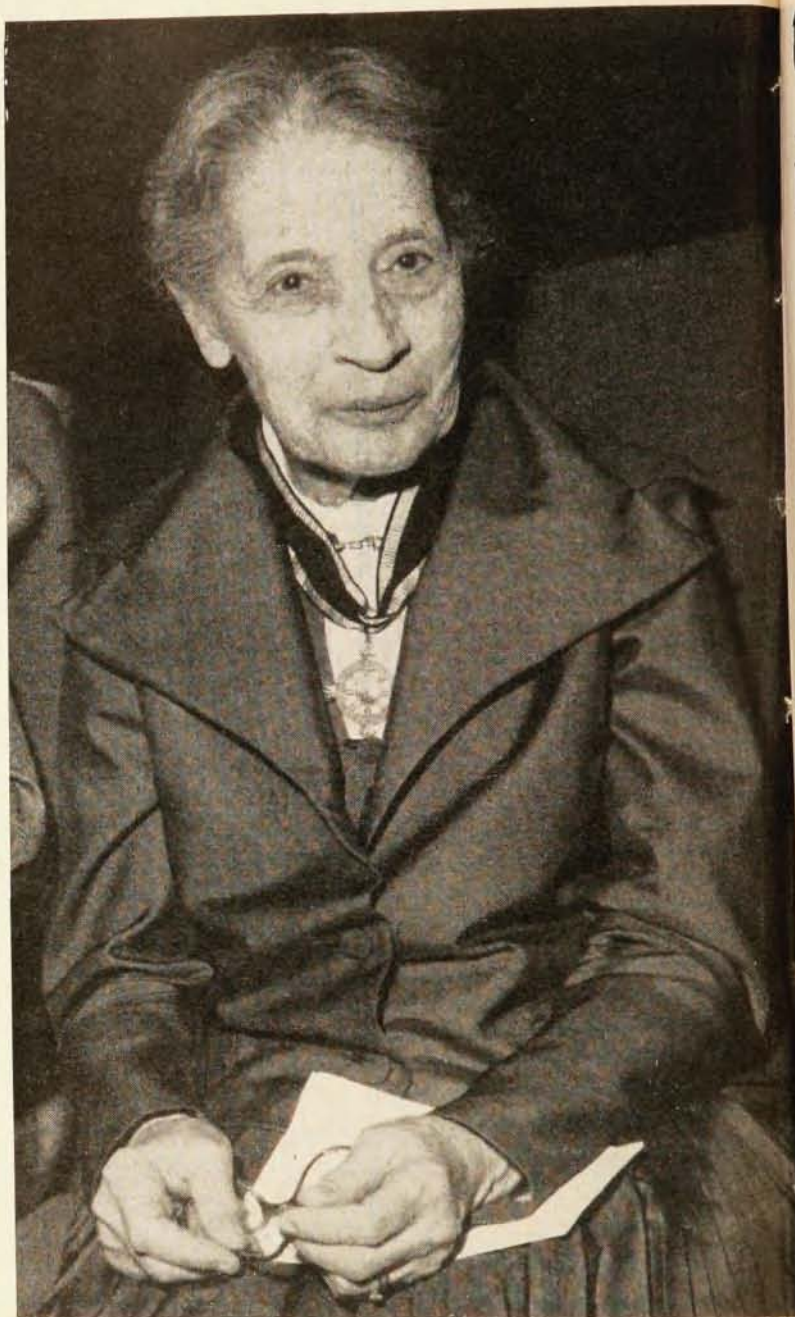


DURING her visit to the United States last year, Lise Meitner was called upon to give several invited lectures at Bryn Mawr College. The following article is based on an address presented on April 15, 1959. Prof. Meitner, then past her eightieth year, was the guest of Bryn Mawr for several weeks, and during her stay took an active interest in the work of the Physics Department and gave freely of her time and energy in talking with students.

By winning international recognition for her work in physics during the past half century, Prof. Meitner has been an important influence in the progress towards gaining educational and professional equality for women in fields traditionally dominated by men. After receiving her doctorate in Vienna, she moved to Berlin in 1907 and for some years, while collaborating with Otto Hahn in the study of radioactivity, conducted her research in the carpenter's shop of the Fischer Institute, where all laboratories and classrooms were closed to women. In the years that followed, until the Nazi tyranny made her continued existence in Germany impossible, she rose to a leading position in the physics community of Berlin. Upon leaving Germany, she carried with her the knowledge of the curious experimental results obtained by Hahn and Strassmann in their bombardment of uranium with neutrons. The famous 1939 letter to *Nature* by Lise Meitner and Otto Frisch correctly interpreted the results, in the light of Bohr's atomic model, as evidence that nuclear fission had occurred.



After 20 years in Stockholm, where she worked in the Swedish nuclear program, Lise Meitner has quite recently moved to Cambridge, England. Her visit to the United States last year was arranged through the efforts of Walter C. Michels, chairman of Bryn Mawr's Physics Department. In a photograph taken during the 1958 meeting of the American Physical Society in New York City, Prof. Michels (left) is shown as he discussed the proposed invitation with Miss Meitner's colleague and nephew, Otto R. Frisch of the Cavendish Laboratory, who was at that time visiting Cornell University.

the STATUS of WOMEN in the PROFESSIONS

By *Lise Meitner*

IN trying to tell you about the history of professions for women, I shall deal mainly with the problems of academically trained women because this is likely to interest you most, and is certainly the aspect most familiar to me. Let me start, however, with a few remarks about women's work in general.

The cooperation of women in such fields as agriculture and home economics is surely very old. Even today, there are some primitive peoples about whose patterns of culture we are well informed by the books of two outstanding American women, Ruth Benedict and Margaret Mead, who assign greatly varying tasks to their women. I am mentioning those books, not only because of their great importance for the science of man, but also because they show so clearly how much in a group of people the development of cultural problems is affected by accepted customs and the common way of life of the group. In the same way the gradual development of the professional and legal equality of women can only be properly understood if one remembers how many accepted customs had to be overcome in the struggle for the emancipation of women.

It has often been said that the Bible has contributed to the discrimination against women by the role it assigned to Eve in Paradise. It is Eve who bears the chief blame for the sin against God's commandment, not Adam. On the other hand, the Old Testament mentions highly respected woman prophets and judges, and in the New Testament we find many examples of noble behavior and self-sacrificing devotion among women. As to witch hunts (the last of which, as far as I can tell, seems to have taken place in Glarus, Switzerland) it is very debatable whether they were connected with the fact that, particularly in the Puritan-Protestant religion, women were considered the embodiment of evil. Men, too, have been burnt as witches, while, on the other hand, in Catholic countries the mother superior of a convent had the rank of a bishop.

The question about the position of women—before the onset of the "Frauenbewegung"—cannot be answered properly without considering sociological, sexual-psychological, and many other aspects of our Western culture. Certainly, women did not live a life of leisure

in ancient times. Most things needed for daily life were made in the home, and much of it was women's work. This is not only true of agriculture, both for sale and home consumption, but also applies to such domestic occupations as spinning and weaving, sewing and cooking. This work in the home was not based on professional training, although spinning, weaving, etc. were skills expected from every young girl. But already in the Middle Ages there existed certain industries, such as silk manufacture in Italy and southern France, which were organized on factory lines and where women and children were employed preferentially, in particular for certain kinds of work like the spooling of the silk. Of course, that too was "unskilled" work.

It was the French Revolution that created the feminist movement in its modern sense, when the demand for equality of men and women was first publicly formulated and discussed. But the Industrial Revolution in England too was of influence here, mainly between 1750 and 1832. The rise of industrialism was not accompanied by changes in the current political system, but the earlier puritanical revolution and the changes after 1688 had a profound influence on economic thought. Later, the idea of evolution gave further support to the ambitions of women by counteracting the tendency to cling to traditional ways. There was a growing desire for new things and a belief that they were possible.

The supporters of equality for women naturally demanded in the first place the establishment of technical schools for training women for crafts and trade, for home economics and agriculture, and, of course, they also demanded suitable schools for preparing women for a university career. In Germany, the first agricultural school for women was opened in 1920, but in Prussia only men were allowed to teach in those schools!

The professional training of women encountered great opposition in nearly all the professions. It was a hard struggle which in each country was paid in its own way; but the motives for the opposition were essentially the same everywhere, and the influence and aftereffects of old habits and traditions can be clearly



With students on the steps of Bryn Mawr's library, Mrs. Walter C. Michels (who teaches Latin) and Prof. John R. Pruett of the Physics Department listen as Lise Meitner talks with Prof. Rosalie Hoyt, also of the Physics Department.

seen. As an example, let me quote some of the famous plays by Molière like "Les Précieuses", "Les Femmes Savantes", "L'Ecole des Femmes", and others.

Molière's ideas were used in Germany, against higher education for women, as late as the twenties! Molière's attitude is well known to have been conditioned by a literary group who used to meet in the palais of a French marquise, whose female members, among them the well-known writer Mlle. de Scuderi, called themselves "les précieuses", a term of distinction which Molière turned into a term of ridicule. But to explain that attitude, I must say something about those questions concerning education which were much debated at the time. It was the time when people tried, particularly in England and France, to reconcile the demands of humanism and realism in rationalism. Not the acquisition of knowledge, but the education and cultivation of the mind were regarded as essential. In France, this gave rise to the aristocratic ideal of the "honnête homme", who acquires vision and freedom of mind by a variety of studies but refrains from any practical occupation or service. The English equivalent was the gentleman, represented as an educational ideal, particularly by John Locke. The précieuses, ridiculed by Molière, presumably aimed at a similar goal.

As against this aristocratic idea of education, the great Czech educator and theologian Comenius presented a very different attitude: he demanded general education for all. It is perhaps interesting to hear one

of his arguments, as he put it: "If someone asks what is to be the outcome if craftsmen, peasants, porters and even the womenfolk become scholars, then answer: When this general education of the young is properly provided, then in future none will lack good material for thinking, wishing, ambition or work."

Almost at the same time as Molière's plays there appeared the English translation of a paper written by a woman in Latin; it was called "The Learned Maid or Whether a Maid May Be a Scholar?" The English translator, a school teacher named Clemens Barkdale, added a lengthy comment, saying among other things, "that maids may and ought to be excited and encouraged by the best and strongest reason, by the testimonies of wise men, to the embracing of this kind of life". Barkdale probably felt that way because he realized that the destruction of the convent schools in England had deprived the girls of a place of education for which no replacement had yet been produced. The game was always the same. There were sharp adversaries and passionate advocates of the emancipation and higher education of women, and both were found among men as well as women. The literature that grew up around this is understandably of great variety, since so many questions are tied up with it: political and economic conditions, cultural and moral attitudes and institutions, in brief, everything that belongs to the pattern of culture of a society. And the value of the more recent writings for and against women's emancipation varies as much as their motivation.

The struggle for the establishment of secondary schools for girls and for their admission to universities took place mainly in middle-class circles. A number of periodicals were dedicated to the problems and aims of the feminist movement, and older pamphlets were translated afresh, such as "Vindication of the Rights of Women" by Mary Wollstonecraft.

I am, of course, most familiar with the corresponding literature of Austria, Germany, and Sweden. In the desire to find arguments in favor of the equality of women with men, people studied the education of women in old times, centuries back. Of course, there were well organized women's organizations to represent women's rights in all civilized countries. In Germany, we must mention in the first place Helene Lange, who started her struggle for a new kind of school education for girls in 1887, with a petition to the Prussian Ministry of Culture, in which also the admission of women to universities was demanded and argued for. She caused an enormous sensation but had at first no success. She devoted, however, all her time

and all her strength to her aim, and twenty-one years later, in 1908, she achieved together with the reform of girls' schools also the admission of women to German universities. In Austria, it was Marianne Hainisch, and in Sweden Fredrika Bremer, who did much for the modern education of girls. Marianne Hainisch did this in connection with the Vienna Society for Expanding Women's Education; that society issued in 1927 a celebration volume *Dreissig Jahre Frauenstudium*, giving statistical material on the advances during thirty years.

Fredrika Bremer fought chiefly in her novels for the equality of women; nevertheless, she is still honored and indeed venerated as the leader of the feminist movement in Sweden. In Stockholm, she has a monument; a large women's association is named after her, and her personality has been the subject of many studies by present-day Swedish (male) authors. She was really much ahead of her time, traveled as a single woman as far as Greece and America, and has found a very charming appreciation by the famous Swedish writer Selma Lagerlöf.

WHEN we look for male supporters of the higher education of women and of their professional equality with men, then it is remarkable how few men of general reputation we find. Perhaps we should mention the well-known German writer, Graf Hermann Keyserling, who, in his book *America, the Rise of a New World*, mentions the great influence of middle-class women in America, and considers it, without reservation, as favorable. Also the famous theologian Adolf von Harnack, father of Mrs. von Zahn-Harnack, who was very active in the German feminist movement, supported the striving for education among women, and opposed the prejudice that women teachers should be inferior to men. This was also the view of Friedrich Althoff, the well-known organizer of the Prussian universities. However, Harnack would have liked to see the professional training of women limited essentially to the unmarried ones.

On the other hand, you find a considerable number of very respectable names among those men who—from the most varied viewpoints—have made strong objections to the higher education of women and to their admission to various professions. Those attacks against women's emancipation were directed partly against their training for certain professions, partly in principle against any kind of higher education for women, ambitions that got lumped together as "emancipation of women" or "feminism". I won't say much about some extreme writings, as for example a book that appeared in Germany in 1910 under the title *Are Women Human?* with the Latin subtitle *Mulieres homines non sunt*. More serious and obstructive were books by respected scientists, as the book by the famous German physiologist, Paul Möbius, *The Physiological Feeble-mindedness of Woman*, whose twelfth unaltered edition appeared as late as 1922. Or the pamphlet of the reputable Austrian medical doctor Max von Gruber on *Girls' Education and Racial Hygiene*, published in

1916, which claimed that the deliberate aim of the feminist movement was the destruction of the family.

The same attitude is represented by the American A. Smith, as shown by the title of his book, *Women's Higher Education and Racial Suicide*, which appeared in New York in 1905 in *Popular Science Monthly* and which attempted to prove that mental emancipation of women is a serious menace to the existence of the human race.

In this list of adversaries we should also mention the famous philosopher Eduard von Hartmann who, in his "Contributions to the Feminist Question", declared in 1922 that there was a sexual differentiation of morality whereby women had a lack of conscious morality. There was even sharp opposition against female physicians on the part of famous medical men, such as the Viennese professor Eduard Albert. Almost as much opposition against the higher education of girls came from various women's circles.

Women have achieved equality in different countries at different times, and differently in its different aspects. It is by no means the case that progressive countries showed their progressiveness equally in all professional fields. For instance, Switzerland, for many years the Mecca for women who wanted to study, has to this day no vote for women and has recently again voted against it, on February 1, 1959.

There are, of course, exceptions, such as the Russian Sonja Kowalewska, who obtained a professorship for mathematics in Stockholm, in the 1880's, or Dorothea von Schläözer, who became a doctor of philosophy in Göttingen as early as the beginning of the 19th Century.

In some respects the United States was far ahead of other countries because it admitted women as parsons as early as 1851. In Sweden, on the other hand, the possibility of admitting women theologians as priests was recently discussed thoroughly, and then declined by the leading bishops, though accepted by the government. In Germany, the problem was discussed in 1927, in a paper "What Shall We Do With Our Women Theologians?" from the viewpoint of the Protestant churches; the author, Paul Ebert, came to the conclusion that women should be admitted to auxiliary posts, but not to service on the pulpit or at the altar. Even so, the question was studied 30 years earlier in Germany than in Sweden. On the other hand, the legal regulation for the admission of women to the university was already settled in Sweden in 1873, but in Germany only in 1908. Amusingly, the main difficulty in Sweden—and in England too—was that the regulation before 1873 referred specifically to men; the whole problem ultimately was to replace the word "men" by the word "persons", in order to make the admission of women to higher schools possible. But when this was done, it also gave women the possibility to acquire the right to lecture; in Germany, this did not happen until after the first World War. Even in 1918, when the great mathematician Hilbert, in Göttingen, tried to obtain the faculty's permission for his talented woman assistant to apply for "the venia

legendi" (which would have made her a member of the faculty), he met with such indignation that he answered with the famous remark: "But, gentlemen, a faculty is not a swimming pool!" Nevertheless, Dr. Emmy Nöther was not allowed to become a lecturer at that time. In Austria, women were at first admitted as students to the philosophical faculties only in 1897. In 1901, the medical faculties followed suit, and only in 1910 the faculties of law.

You probably know better than I how things went in America. I happen to know that the centenary of the Female Medical College of Pennsylvania was celebrated in 1950 in Philadelphia by the Medical Women's International Association.

The leading role which the United States has played in establishing good training possibilities for women has often been stressed abroad, and particularly in Germany. In one of the German books on the American educational system you read: "In no other field have the Americans done such excellent work as in the education of women." In a 1959 issue of the *Smith College alumnae quarterly*, it is mentioned that New Englanders pioneered education in America, having provided the first secondary school and the first women's college.

Looking back, I have the impression that the problems of professional women in general, and particularly of academic women, have found fairly satisfactory solutions in the last 80 or 100 years. Not all that can be desired has been achieved. In principle, nearly all male professions have become accessible to women; in practice, things often look different.

In England, it was only a few years ago that the right of female teachers to receive the same pay for the same work as their male colleagues was recognized, and the actual process of equalization has been spread over seven years. On the other hand, there are in England a number of excellent women scientists who are recognized as such, and are fellows of the Royal Society, such as the biologist Charlotte Auerbach, the mathematician Mary Cartwright (principal of Girton College, Cambridge), and the crystallographer Dame Kathleen Lonsdale (Dame is an honorary title, equivalent to Sir). All these are well known outside England. Dame Caroline Haslett, an engineer, was sent to Sweden during the last war in order to study important electrotechnical problems. This makes a pleasant contrast to the struggle of English women teachers for equal pay.

THERE is much I could tell from my own experience, both of instances of help and assistance and also of discouraging and sometimes comical prejudices. For example, between 1910 and 1915, I had written several review articles on physical subjects for the semipopular magazine *Naturwissenschaftliche Rundschau*. As usual, I had signed them with my family name, without the first name. One day, the publisher received a letter in which one of the editors of *Brockhaus* (a well-known German encyclopedia) asked for

my address, because he wanted an article on radioactivity for his encyclopedia. But when the answer revealed my sex, the editor of *Brockhaus* wrote back almost indignantly that "he would not think of printing an article written by a woman!" (This, after reading, and apparently liking, some of my previous articles!) Even Max Planck, to whom both as a human and as a scientist I owe so much, considered it at first very peculiar that I was thinking of doing scientific work. I had obtained my doctor's degree at the University of Vienna, and had published several papers in scientific journals; in 1907, I went to Berlin for further studies and presented myself to Planck, in order to attend his lectures. He was very friendly, but clearly astonished; he said, "You have a doctor's degree, what more do you want?" When I replied that I wanted to understand physics more thoroughly, he said a few friendly words, but did not pursue the point. But five years later he offered me a job as assistant lecturer at his Institute of Theoretical Physics at the University of Berlin; this, in Prussia, was a complete innovation. Not only did this give me a chance to work under such a wonderful man and eminent scientist as Planck; it was also the entrance to my scientific career. It was the passport to scientific activity in the eyes of most scientists and a great help in overcoming many current prejudices against academic women. The great organic chemist Emil Fischer was at first reluctant to allow me to work in his laboratory with Otto Hahn, and made it a condition that I must not go into the classrooms where Hahn and many other students did their experimental work; consequently, I could not study radiochemistry for the first few years. But in later years he gave me much support, and I owe it largely to him that I was eventually entrusted with equipping and directing the physical-radioactive section of the Kaiser-Wilhelm-Institute for Chemistry in Berlin-Dahlem.

But my own experiences are just those of an individual and are of little value in getting a clear picture of the general conditions. Unique achievements like those of the scientists Marie Curie or Irène Joliot-Curie, of the writer Selma Lagerlöf, of Florence Nightingale can silence the current prejudice in the individual case, but the prejudice still persists. It is directed mainly against women in middle-class occupations, and particularly in high-ranking posts. Nobody seems to have protested against women as factory workers. But I don't know of any woman who has a leading position in heavy industry. I would not know whether this is because of the lack of women aspiring to such positions or because industrial firms are reluctant to have women in leading positions. But there seems to be no doubt that women often have great difficulty in reaching high positions in the educational system. In Germany, the women's associations have made official complaint about this; they point out that the school authorities consider themselves generous if they appoint even one woman into school administration. The Austrian Association of Academic Women has carefully

studied the question of women's equality in positions with a high salary, e.g., higher teaching posts, and has formulated a number of demands which largely coincide with those made by the corresponding committees of UNESCO. The International Federation of University Women is represented in UNESCO, and in addition some of its members attend UNESCO meetings as representatives of their respective governments. In November and December, 1956, there was in New Delhi a General Conference of UNESCO, which cooperated with the Status-of-Women Commission on general questions of education and teaching; of the 80 member states, 75 were represented, mostly by their ministers of education or by educationists. One of the main points was the study of the conditions prevalent in the teaching profession. I am glad to say that great stress was also placed on the importance of educating people toward international understanding.

It must, however, be admitted that some objections against women's professional work, objections which 50 years ago were rightly branded as prejudices, must now be considered more seriously because of the great social and economic changes which have happened in the more advanced countries. For instance, in the early years of the feminist movement, the objection was often made, and in a very exaggerated form, that the education of women would destroy the family. In that form the objection was surely to be rejected. Eduard von Hartmann, the philosopher I mentioned before, wrote a paper "The Survival of the Family", in which he considered the finishing school as the great menace to the family, and wished to limit the education of girls to the level of the primary school. One should think that such views are nonexistent today. But, surprisingly, some Swedish priests in their refusal to admit women theologians to priesthood have uttered similar opinions about the higher school education of girls and about their study at universities; and that in 1958! For that there can be no argument, and no excuse.

More difficult is the problem of professional women with children. Here the increasing disappearance of domestic service has created a real problem. Some women are sufficiently healthy and well-balanced to cope with the double task of profession and family, without detriment to either, and without damage to themselves. I have encountered a good many such women in Sweden, and also in Germany; one of them was Mrs. von Zahn-Harnack. But many are not able to do that. The great difficulty of solving this problem in the right way might be demonstrated by saying something about the problem of women teachers in Germany.

In Germany, a woman teacher must quit when she marries. Now, as you know, in Germany—as in all countries—there is a great shortage of teachers for all kinds of schools. So the question is under discussion whether one should not employ married women teachers. However, full-time teaching under present conditions—large classes and long duty hours—is a strenu-



Lise Meitner with Otto Hahn on the occasion three years ago when she received the Otto Hahn Award. This issue's cover photograph, taken a half century ago, shows the two in Berlin during the early days of their research collaboration.

(Both photos courtesy Ullstein)

ous occupation, in particular if in addition one has to look after a family. And, of course, a good teacher ought to keep herself informed, not only on her special subject but also on pedagogical problems, and should contribute to their solution. All this can become too heavy a load, and that is true for any professional woman with a family, whether she is a teacher, doctor, or scientist. I don't say it is necessarily too much, but it *can* be too much.

In some countries, including Sweden, it has been proposed that half-time posts be created for married women; but some women's organizations have opposed this plan, with the probably justified argument that this part-time employment would stamp women as inferior employees and would handicap them greatly in the possibility of promotion.

Undoubtedly, women can see no ideal solution to their problem: profession and family. But for what human problems do ideal solutions exist? The husband can assist by helping in the house, and in many young households he does; maybe it is not the complete answer.

We can no longer doubt the value and indeed necessity of woman's intellectual education, for herself, for the family, and for mankind. Let me conclude with the words of Matthew Vassar, founder of Vassar College, spoken in 1865:

"A woman having received from her Creator the same intellectual constitution as a man, should have the same rights as man to intellectual culture and development."