

STATUS

The Committee on the Status of Women in Astronomy - American Astronomical Society

JUNE 1990

Ida M. Barney, Ace Astrometrist

by E. Dorrit Hoffleit

As chief assistant to Frank Schlesinger at Yale from 1922 until his retirement in 1941, Ida M. Barney (1886-1982) sincerely claimed that those were the happiest years of her life. At the same time, however, she had been irked that her pay and rank were far below those of men with comparable qualifications.

Daughter of a Professor of Civil Engineering at Yale, Ida attended Smith College and was graduated with the Class of 1908 and elected to Phi Beta Kappa. She then entered the Graduate School at Yale earning her Ph.D. in Mathematics in 1911. Until she became Schlesinger's assistant, she taught mathematics at various womens' colleges (Rollins, Smith, Lake Erie, and Meredith Colleges). She left the teaching profession because she felt frustrated trying to cram mathematics into students who had little grasp or interest in the subject.

Frank Schlesinger, Director of the Yale Observatory from 1920 to 1941, as early as 1901 had written George Ellery Hale, "I am thoroughly in favor of employing women as measurers and computers and I think their services might well be extended to other departments. Not only are women available at smaller salaries than are men, but for routine work they have important advantages. Men are more likely to grow impatient after the novelty of the work has worn off and would be harder to retain for that reason." After coming to Yale, Schlesinger started a group called *The Neighbors*, astronomers from the New England and neighboring states which were to meet informally about four times a year to discuss their research and exchange ideas. But when professional women asked to be included, he commented, "Oh, the opening wedge!" expressing the opinion that admitting women would constitute "imposing a burden on hosts." When the new Allegheny Observatory was dedicated in 1912, Schlesinger, then its director, had somewhat facetiously stated he would like to mount over the entrance, "Abandon hope of making discoveries, all ye who enter here." What he meant was that most of astrometry (his specialty), especially the determination of the proper motions of stars, required the acquisition of data that could take generations to accumulate before the ultimate purpose of the work (e.g., the determination of galactic rotation, solar motion, and galactic structure) could be accomplished.

Dr. Barney's knowledge of mathematics served Schlesinger well and she obviously enjoyed the arduous work of measuring coordinates of stars on photographic plates, reducing the rectangular measurements to right ascensions and declinations, and comparing her results with those in older star catalogues in order to determine stellar proper motions. In all, from 1922 through 1959, she was author or co-author, and always distinctly the major contributor, of 22 volumes of catalogues in the *Transactions* of the Yale University Observatory, comprising the positions and proper motions of nearly 147,000 stars.

The original plan for the Yale Zone Catalogues (as this project was called because the work was carried out in discrete narrow zones of declination) was to measure proper motions of stars between +30" and -30" declinations. After 28 years of effort, the Yale catalogues were completed in 1950 -- including about 128,000 stars mostly brighter than 9.5 photographic magnitude. Approximately half of all the required plate measurements were carried out by Miss Barney herself, the remainder under her supervision by her assistants. In a Yale news release at this time it was pointed out that the only similar work had been carried out some 60 years before, in which 14 observatories had cooperated! A feature article eulogizing Ida Barney appeared in the *Boston Post*, December 3, 1950. It concluded, "It is a job of devotion well done, a testimony to the strong will of a

woman who was delegated to carry out the dream of a great astronomer."

Miss Barney's career and achievements have been compared with those of Annie J. Cannon (1863-1941) of Harvard, who classified the spectra of some quarter of a million stars. Pickering, like Schlesinger, had fixed ideas about the employment of women, who were expected to work as they were told, not to go off on a promising tangent for independent research. Thus, intellectual Antonia Maury was not appreciated at Harvard because she set up her own classification system instead of simply applying his, and concerned herself with possible physical interpretations, efforts he considered premature. Miss Cannon, on the other hand, classified on the system set up by Pickering, improving upon it as experience dictated, but basically doing just what was expected of her, and was never bored by the colossal amount of routine because the work was obviously important. Moreover, her work was occasionally rewarded by the serendipitous discovery of unusual stars. Pickering and Schlesinger set up the procedures; Cannon and Barney respectively, carried out the work intelligently, professionally, and contributing ideas, but basically following directions and carrying out work whose ultimate research usefulness remained for the benefit of future astronomers. After the decease of their respective directors, both ably continued their work with unprecedented momentum and devotion.

Having myself worked under the shadows of both these achievers, I sincerely admire and appreciate their work. On the other hand, as Miss Barney's successor at Yale, I found one minor incident somewhat blemished my previous concept of the independence of her thinking. At the end of her career, she was tired and anxious to retire, but yet more anxious to complete the final pair of catalogues on which she had been working. Having become somewhat disdainful of the IBM computers she had at first openly welcomed, she complained "We used to get out a catalogue every three years. Now with the high speed computing machines, it has taken us ten years and we are not through yet!" Scientifically, the waiting was well worth while: thanks to the progressive technical improvements, her final two catalogues had the smallest probable errors of any of the Yale catalogues.

When these tables were finally completed, she asked me to write the introduction. When I had done so, she crossed out the section I had written concerning the double stars, which frequently cause more problems than single stars, especially when the proper motions are determined from a comparison of old visual observations with new photographic, and only one component is measured in each case, but not necessarily the same in both. I felt special attention should be given these problem stars. Miss Barney haughtily commented, "Dr. Schlesinger did not include that, so why should you?" Alas, this gifted and usually charming lady seemed thereby to exemplify exactly what Schlesinger expected of women assistants. Obviously Schlesinger, known as "the father of modern astrometry" could not have achieved his purpose of amassing large numbers of proper motions without its undeviating pursuit by his well trained and painstaking assistant.

In honor of her gigantic accomplishment, Ida Barney, in 1952, was awarded the Annie Jump Cannon Prize of the American Astronomical Society. This prize had been established by Miss Cannon in 1934 to "be awarded to women for distinguished contributions to astronomy or for similar contributions in related sciences which have immediate application to astronomy" (*Pub. AAS*, 8, 317, 1936) and without age restrictions. Miss Barney was the seventh recipient, following Cecilia Payne-Gaposchkin, Charlotte M. Sitterly, Julie Vinter-Hansen, Antonia Maury, Emma W. Vyssotsky, and Helen S. Hogg. In Miss Barney's case and until 1974, there awards were honors in the very strict sense that the recipients were chosen by a committee of the AAS without the candidates' previous knowledge. I feel Miss Cannon would have been horrified to find that nowadays candidates for her prize must *apply* for the award. It is still a great honor, but more like the honor of receiving a highly competitive NSF grant, different in character from what Miss Cannon intended, through perhaps more valuable in the long run as encouragement of research rather than recognition for major accomplishment.

As a person, Miss Barney was a gracious hostess as well as a beautiful petite lady. She lived with her sister, an employee of the Berkeley Divinity School, in their lovely family home on Linden Street in New Haven. As a hobby, she was a bird watcher, and she also liked plants. My first spring in New Haven I boasted one day having seen my first crocus of the season; gleefully she reported they had been out in her yard for already two weeks. When I first came to Yale, our colleague, Louise Jenkins of the Yale Parallax Catalogue fame, drove me sightseeing around New Haven. We went to West Rock where she said there was the best spring water, and she filled several jugs to take home. Later, when Miss Barney also took me on a tour, I asked her if she, too, liked that water. "No!" she retorted, "My father was a sanitary engineer!" To know both of these, my predecessors at Yale, was a pleasure, inspiration, and privilege, both at work and socially.

Letters to the Editor

Dear Dr. Eastwood:

I'd like to provoke some discussion on the problem of how we can continue to support interested and talented women who major in astronomy. The NSF, NASA, Physics Today, and others have been presenting evidence that the US will need more physical scientists in the near future and that one way to get them is to encourage more females and minorities to become physicists and astronomers. It seems to me, to be successful, we must encourage students who are not already convinced they will be scientists, and consequently, who are somewhat scientifically culturally deprived.

Small liberal arts colleges have been quite successful at attracting many females to major in astronomy, and many of our graduates are now successful astronomers. However, for many students, in spite of their interest and promising ability, the B.A. is a dead end; they aren't accepted by graduate schools because their preparation is often less than that of their male colleagues from universities. Especially at this time of year, as the rejections come in, I wonder if I have done my students a favor by encouraging them to major in astronomy.

The main reason for their having less preparation is because many of these students would not have become science majors if they had gone to a large university. They have not lived through elementary, middle, and high school believing that they were scientists. Thus, they not only have fewer science and math courses before entering college, they also have missed much of the "science culture" while growing up. Many of our majors "discover" astronomy at the end of their sophomore or even early in their junior year. This means they have had fewer math and physics courses when they take their physics GREs and apply to graduate school. Consequently they are turned down because of low scores and/or "a weak background".

I am not convinced that GRE scores and success in graduate school are correlated. I am also not convinced that students who need to take a few undergraduate courses in graduate school necessarily take longer to complete their theses. I entered MIT sixteen years after receiving my B.A. If I had had to take GREs, I certainly would have flunked, but I managed to receive both my S.M. and Ph.D. within five years. I have found little correlation between a student's GPA and her aptitude in experimental research from my experience of hiring undergraduates to work with me on research. Often, the most brilliant students are poor teachers and indifferent researchers. Unfortunately, the undergraduate institutions do not receive copies of their students' scores in standardized tests, so we have no way to do a statistical study on whether there really is or isn't a correlation between the scores and success in graduate school and career, but my intuitive feeling is that there may be less correlation than graduate admissions committees believe.

My questions to the readers of Status are: "Am I doing my students who don't have 'appropriate' backgrounds a disservice by encouraging them to attempt the impossible?" and "Are there imaginative admission committees with flexible graduate programs who will take a chance on an enthusiastic, budding astronomer with good grades and successful research experience, but lower test scores and/or fewer physics courses at entrance?" We still live in a society where young females are often not encouraged in mathematical and scientific endeavors at an early age. If we really want to increase the numbers of females in scientific fields, we need to begin when they are in elementary school and in the mean time we also need to find programs which will give females with promise a chance, even if they are slightly less prepared.

Sincerely yours,

Priscilla J. Benson
Assistant Professor of Astronomy
Wellesley College

Dear Dr. Eastwood:

I am writing in response to Alma Zook's "Chairperson's Corner" in the January 1990 issue of STATUS, with particular reference to her comment that it is a problem that there are "too few women in science in general and in astronomy in particular." Whereas it is a *fact* that women comprise a minority within the astronomical community, it seems to me, rather, that the *problem* is the way women in astronomy (and in other professions) are treated.

As a student preparing to enter a profession in which men have traditionally dominated (and where: in some locales and in some denominations they still do, to the point of exclusivity), I feel I can speak from some personal experience of being in the minority. I want three things: (1) to be listened to, (2) to be taken seriously, and (3) to belong. Interestingly enough, these are the three needs identified recently by a campus speaker who was addressing the needs of victims of abuse. The problem is not that there are too few women in some traditionally male professions; the problem is that, in subtle or in not-so-subtle ways, women there continue to suffer abuse.

A related problem, as I see it, is that often those persons doing the "abusing" do not see themselves as abusers. They believe that they *are* listening to women, that they *are* taking them seriously, and that they *are* allowing them full rights of belonging. I am not speaking now of the ways in which women are being permitted (or even encouraged) to share in political power within professional groups. Representation on committees and governing boards is but a first step; it does not guarantee that women, once there, will be listened to, taken seriously, or accepted. Until those things happen, the problem will persist.

What to do? To begin, I think we need to be alert to occasions and ways in which we as women are not listened to. This may mean confronting, clarifying, maintaining one's position by patiently repeating or restating it . . . whatever it takes. It means that we speak *expecting* to be listened to and cautiously assuming that we are. It means that while we are trying to get it to happen, we act as if it were already a reality. We seek to change the system from the inside.

Sometimes there is strength and hope in finding a name for the problem and knowing it happens to

women in other professions. I wish I were wrong. I don't like to think that abuse of women is cultural, but I am becoming convinced that it is. At the same time I am also becoming convinced that it can be stopped. It is, in part, up to us to stop it.

Judy Schultz

Student

Yale Theological Seminary