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**MME CURIE'S 2011 CENTENNIAL AND THE PUBLIC  
DEBATE ON THE UNDERREPRESENTATION  
OF WOMEN IN SCIENCE**

*Lessons from the History of Science*

INTRODUCTION

During the calendar year 2011 the scientific community, science literati, women scientists, historians, and various others in the world-at-large celebrate the centennial (100<sup>th</sup> anniversary) of Mme Marie Curie's (1867–1934) Nobel Prize in Chemistry (Nobelprize.org, 1911), awarded to her in 1911 in recognition for her discovery of the new elements—radium and polonium—and study of the properties of radium in compounds. The 1911 Nobel Prize was as a sole award, reaffirming her share in the 1903 Nobel Prize in Physics (divided between M. Henri Becquerel (1/2), M. Pierre Curie (1/4) and Mme Marie Skłodowska Curie (1/4)) (Nobelprize.org, 1903) and also accepting the greater challenge posed by her interdisciplinary discoveries for the field of chemistry.

The 2011 Centennial is a major event for several converging reasons: first, it marks the recognition of Mme Curie's interpretation of radioactivity as an atomic property—a step that revolutionized our understanding of atoms, the ultimate constituents of matter, as no longer immutable. The phenomenon of radioactivity had been initially observed by Becquerel in 1896 and referred by him as *uranium rays*. Mme Curie's conception of radioactivity as an atomic property left an indelible mark on science, as well as on the history of the 20<sup>th</sup> century. That conception became the basis for the discovery of artificial radioactivity in 1935 (by Mme Curie's daughter and son-in-law, Irène and Frédéric Joliot-Curie – see chapter by Gilmer, 2011) and of the new field of nuclear chemistry. A decade later, in 1945, the construction and use of the atomic bombs, a technoscientific feat that built upon the concepts of both natural and artificial radioactivity, led to an earlier conclusion of World War II in the Pacific Theater, thus saving the lives of many combatants, both American and Japanese, albeit at the price of so many Japanese civilian casualties (Goldberg, 2000).

Second, the 2011 Centennial of Mme Curie, recognizing the best known woman scientist in the world and the only one widely known in the public realm, outside of science, comes only six years since a yearlong public debate on the underrepresentation of women in science, which unfolded in 2005 and has continued to occasionally erupt well into the present (Abir-Am, 2010).

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Third, the sheer rarity of a scientist winning twice the much-coveted Nobel Prize ensures that even 100 years later, scientists and the public at large would like to know more about how and why Mme Curie twice received such a rare honor in separate fields of science.<sup>1</sup>

The current Centennial should thus provide a unique opportunity for taking stock of 100 years of changes in the status of science in society, as well as in the status of women in science. In this chapter, I focus on the above mentioned second topic, i.e., how and why the 2011 Centennial of Mme Curie's Nobel Prize in Chemistry can be viewed as a barometer for the public response, within and outside the scientific community, to the ever present issue of the underrepresentation of women in science.

My assessment is based on the *early birds*, i.e., commemorative events held in the first half of 2011. Indeed, the purpose of this chapter, written by an historian of science with expertise in scientific commemorations as a historical and cultural phenomenon, as well as in the history of women in science, is to stimulate a more serious engagement—both inside and outside the scientific community—with a wide range of science policy issues raised by Mme Curie's life in science, issues that still challenge us a century later.

#### CURIE COMMEMORATIVE EVENT AT AAAS 2011

I start by examining a commemorative event that rose to the challenge of learning lessons from Mme Curie's life in science, namely a symposium at the recent Annual Meeting of American Association for the Advancement of Science (AAAS, 2011a), held in Washington DC between February 17–21, 2011.

The AAAS Program Committee scheduled the symposium, “Celebrating the 100th anniversary of Mme Curie's Nobel Prize in Chemistry” (AAAS, 2011b), in an ideal time slot, on the first full-day of the meeting. This fortunate timing and spacing, in addition to the topic that combines the best known woman scientist with the science and history of the Nobel Prize, ensured that the session was well patronized, almost to capacity (~160), including both women and men attendees. The latter deserve to be mentioned because men rarely attend topics focused on women scientists; no doubt the Nobel Prize has such a great appeal to men that they overcame their reticence from *women's topics*.

Co-sponsored by AAAS Sections C (Chemistry; AAAS, 2011c), and L (History & Philosophy of Science (AAAS, 2011d), this session was co-organized by Professors Penny J. Gilmer of Florida State University (FSU), a biochemist, and leader at FSU of the Alliance for the Advancement of Academic Women in Chemistry and Engineering (AAFACWE, 2011)—a National Science Foundation (NSF)-ADVANCE-PAID grant, part of a consortium of five Florida universities that engages in advancing the professional status of academic women chemists, physicists, and engineers—and Alan J. Rocke of Case Western Reserve University, a historian of European chemistry, and outgoing Chair of Section L who also chaired the session and introduced the speakers. Lemonick (2011) provided e-coverage of this symposium.

The first speaker, Patricia Ann Baisden (2011)—a nuclear chemist at the Lawrence Livermore National Laboratory (LLNL), government-owned, national facility but managed by the University of California, and four industrial contractors—discussed Mme Curie's experimental procedures in discovering two new radioactive elements, radium and polonium, with amazingly detailed graphics. Baisden displayed many original photographs given to her by a former director of the Radium Institute in Paris, while asking intriguing questions, such as whether Mme Curie had sufficient experimental basis to claim the discovery of polonium when she did (yes, indeed, even by current standards). Baisden's presence further enlightened us on subtle distinctions between nuclear chemists such as herself and radiochemists, both *descendants* of Mme Curie's discoveries, but one branch being more physical and the other more chemical, as befits the progeny of the interdisciplinary field of radioactivity.

The second speaker, historian Julie Des Jardins (2011) of Baruch College/City University of New York spoke on the long-lasting American fascination with Mme Curie, ever since her visits to the US to raise money to purchase radium in 1921 and 1929. She emphasized how Mme Curie's public image as a woman scientist was adjusted to fit gender stereotypes, such as the claim that her science was *maternal* or that she practiced science primarily for the sake of curing cancer. The impact of such a distorted public image on generations of women scientists is further elaborated in Des Jardins' recent book, *The Madame Curie Complex: The Hidden History of Women in Science* (2010), which builds upon the scholarship on women in science in America by historians of science, most notably, Rossiter (1982, 1995), and scientists, most notably Howes and Herzenberg (1999), among others.

My talk, the third and final one (Abir-Am, 2011a), entitled, "Historical perspectives on the public memory of Marie S. Curie—2011, 1911," discussed the concept of commemorative practices in science, the nexus of reinterpretation that they provide while interrogating the present's relationship to the past; the stimulus they provide for conducting new research in history of science; and their potential ramifications for science policy. I began with analyzing new data on the changing international profile of Mme Curie's commemorations throughout the 20<sup>th</sup> century. Earlier anniversaries were marked only in France and Poland (her adopted and native countries, respectively), culminating with Marie and Pierre Curies' reburials in the Pantheon, the graveyard of great French minds (or as Mona Ozouf (1984) put it jokingly, *L'Ecole Normale des Morts*). This symbolic act made Mme Curie the first woman to be so honored for her own scientific accomplishments, albeit belatedly, coming six decades after her death.

I reflected on the AAAS 2011 symposium in the Newsletter of the History of Science Society (Abir-Am, 2011b).

#### THE DEBATE THAT WILL NOT GO AWAY

On January 18, 2005, *New York Times* discussed then Harvard President Lawrence Summers' defense of his ideas he had presented four days earlier on innate differences between women and men in science (Dillon, 2005). The text of his speech during a conference on diversity in the labor force, held at the National

Bureau of Economic Research, a think tank in Cambridge, MA is available (Summers, 2005). Summers triggered a large response, with people surprised by the provocation in tone and manner, as former Association of Women in Science Executive Director, Catherine Didion, now with the National Academy of Engineering, noted in the *New York Times* a few days after Summers' delivery (Dillon, 2005). Summers' comments generated international coverage as well, for example, in the *UK Guardian*:

The president of Harvard University has provoked a furor by arguing that men outperform women in maths and sciences because of biological difference, and discrimination is no longer a career barrier for female academics. (Goldenberg, 2005, p. 1)

A follow-up article in *New York Times* three months later which interviewed M.I.T. faculty member and notable gender scholar Evelyn Fox Keller, called it the debate 'that will not go away' (Dean, 2005). Around that time, I became the principal investigator on a National Science Foundation-Small Grants for Innovative Research (hereafter NSF-SGER), which has examined the public unfolding of this debate from the viewpoints of history and science policy (Abir-Am, 2005–2006).

As its name suggests, the 2005 public debate triggered persistent coverage in the media during and after 2005. The Committee on Maximizing the Potential of Women in Academic Science and Engineering, National Academy of Sciences, National Academy of Engineering and Institute of Medicine (2007) published a comprehensive book that brought to the debate some measure of closure. But it also gave rise to an ongoing literature on this topic, both policy-oriented and academic, well into the present. For example, recent items, including a paper published by Ceci and Williams (2011) on understanding current causes of women's underrepresentation in science was published in time to be mentioned during our symposium at the AAAS 2011 Annual Meeting.

After drawing attention to the recent and recurrent context of the underrepresentation of women in science as a key policy issue pertinent to my AAAS presentation (Abir-Am, 2005–2006), I proceeded to showcase the work of several historians of science whose research helped dispel the gender stereotypes long shrouding Mme Curie's public memory. Such stereotypes included attributing her research in radioactivity to the goal of curing cancer, presumably a more suitable goal for a woman scientist than Mme Curie's other key preoccupations with industry, metrology, and institution building. Hence, I highlighted the recent work of historians of science, which clarified the centrality of Mme Curie's industrial connections (Roque, 1997), her key role in international standardization of units of measurement for radioactivity (aptly named the curie) (Boudia, 2001), and her role as leader of a research school of great social diversity including men and women, international and French scientists (Davis 1995; Rayner-Canham & Rayner-Canham, 1997; Boudia, 2011).

All these aspects of Mme Curie's actual past have in common one dimension that has long been overlooked, namely her astute exercise of power. Historical research on Mme Curie rarely engaged the role of power in Curie's career, a role that contrasted so much with the patriarchy that existed within and outside of science, which meant that most women were deprived of power, especially formal power.

Only recently historians of science have finally drawn attention to her uses of power as an integral part of her historical persona. The reference here is mainly to the work on Mme Curie as head of a research school (Davis, 1995), her success in having her laboratory accepted as the source of the international standard of a unit of radioactivity, aptly termed the “curie” (Boudia, 2001), and her substantial involvement with the radium industry in both Europe and the US (Roque 1997).

Some of the many biographical studies of Mme Curie, works that are already well known because they cater to a wider public (Brian, 2005; Dry, 2003; Giroud, 1981; Goldsmith, 2005; Pasachoff, 1996; Pflaum, 1989; Quinn, 1995; Reid, 1974) attempted to go beyond the above-mentioned patriarchal mythology created around Mme Curie since the 1920s, often by expanding upon lesser-known episodes from her life. For example, Giroud's account (1981, 1986) has focused on the press coverage of the public scandal that erupted in 1911 around Mme Curie's love relationship with physicist Paul Langevin, thus shedding new light on the private life of a woman scientist best known for her around-the-clock laboratory life. Along these lines, Quinn (1995) drew attention to the collaboration and parallel careers of Curie, mother and daughter (Bensaude-Vincent, 1996).

In my 2011 AAAS presentation, I included a scene from the French film, *Les Palmes de M. Schutz*, directed by Pinoteau (1997), in which Isabelle Huppert played Mme Curie. This was at the same time as the recent death of Greer Garson, who played Mme Curie in the 1943 American film, *Madame Curie*, directed by LeRoy and Lewin (1943) and adapted from Mme Curie's first biography (published by her younger daughter, E. Curie, 1938). Some attendees in our AAAS audience still remembered the unforgettable Greer Garson! A comparison between these two films should be instructive for suggesting how the imagery of a woman scientist has changed over the last half of a century in both French and American cinematographic cultures.

I also drew attention to the pertinence of Mme Curie's work, life, and career for public debates in our own time on the underrepresentation of women in science. Half a dozen or so lessons from her historical case study were offered, including emigration as a condition for pursuing science by women from peripheral countries; diversified collaborative strategies with other scientists, including one's own spouse, so as to preserve the scientific credit—especially for members of disadvantaged groups; and cooperation with industry as a source of financial independence.

I also emphasized how Mme Curie's life also constitutes a resourceful case study in balancing an intense and demanding career with family life, including spouse, children, and relatives in two countries. With the help of a photo portraying Mme Curie and her two young daughters (Figure 1), I drew attention to the exhibition on Curie at the AAAS annual meeting by standing next to the magnified exhibit of the trio's joint photograph. Irène was born in 1897, before Marie's discovery of radium in 1898, and Eve was born in 1904. As I stressed in a humoristic manner to an appreciative audience, this fact remains noteworthy a century later, when the balancing of career and family life by women in science is still considered one of the most challenging parts of women's careers.

The AAAS symposium, which went remarkably well, i.e., without glitches, (except for failing to get the Skype to connect to co-organizer Penny J. Gilmer, then

still recovering from an automobile accident, to watch us from afar), seemed to set a precedent for how model sessions should be. With collaboration between symposium co-organizers—a scientist and a historian, a woman and a man (co-organizers Penny Gilmer and Alan Rocke)—it further produced a spectrum of speakers—a scientist, a general historian, and a historian of science.

But the most unexpected and telling experience with our AAAS Symposium was the opportunity to share a petition (Appendix A) with my audience calling upon scientific organizations to practice gender inclusiveness in seeking contributors for the ongoing Curie Centennial (e.g., special issues of scientific magazines and special symposia and lectures). Shortly before our AAAS session took place, I became aware that our symposium might be exceptional in having had an adequate, perhaps even more than adequate, representation of women speakers and organizers. In retrospect, our symposium may have inadvertently existed so as to compensate for a surprisingly low or no presence of women scientists in commemorations of Mme Curie's Centennial by scientific organizations other than AAAS. This remains a telling phenomenon, which deserves some elaboration, especially since it occurred just a few years after the long debate on the underrepresentation of women in science.

#### OTHER CURIE COMMEMORATIVE EFFORTS IN BOTH THE US AND EUROPE

I examine other commemorative efforts in both the US and Europe that, at least so far, have attempted to engage with the meaning and opportunities afforded by Mme Curie's Centennial in areas such as the public understanding of science, and science education. However, these efforts failed to engage with the Centennial's pertinence to stimulating new work in the history of science, and especially to addressing the science policy aimed at the persisting issue of the underrepresentation of women in science.

#### *Chemistry International's Centennial Issue for Marie Curie*

For example, *Chemistry International (CI)*, the news magazine of the International Union for Pure and Applied Chemistry - IUPAC) featured no single woman among its four guest-editors for its special issue on the Mme Curie Centennial in January-February 2011. As I put it to the audience at our AAAS Symposium, "By comparison, no anniversary issue honoring Martin Luther King would be published without an African-American guest-editor!" The special issue had eight men and four women authors, numbers that can be viewed as encouraging and not that far from parity. When one examines the contents of the *CI* issue, a clear gender demarcation appears with all the male authors writing on a wide variety of scientific topics, some related to Mme Curie, or to her history. However, none of the four female authors wrote about the science because, intentionally or otherwise, the editors assigned them to *female topics* such as family, traditional female occupations, or women in science.

This relegation of women's topics for the women *CI* authors is particularly disturbing because it further obscures the fact that two of the four women authors have high technical expertise. Instead of signaling that fact, the all-male four guest

editors, even though they worked with a woman managing editor, evidently considered that all the women authors should be associated with *female topics*. This is a stance that is not only historically inauthentic by obscuring the progress made by women scientists in fields pioneered by Mme Curie (e.g., radiochemistry, nuclear chemistry; see above the presence of a woman nuclear chemist in the AAAS Symposium) but also obtuse to major science policy efforts currently underway to combat the underrepresentation of women in science. Any woman student reading this news magazine will conclude that even for the centennial celebration of the best known woman scientist, Mme Curie, women's presence as authors is still defined by gender stereotypes (i.e., association with family, women's issues, and traditional female occupations, rather than science proper).

For example, *CI* recruited Mme Curie's granddaughter, H el ene Langevin-Joliot (2011) born in 1927, current age of 84. Langevin-Joliot, Professor of Nuclear Physics at the Institute of Nuclear Physics at the University of Paris and Director of Research at the CNRS, remained the only woman scientist the organizers could think of as suitable! This reminds us of the 17<sup>th</sup> century when the new founders of science such as Galileo and Descartes conversed with aristocratic women (e.g., Grand Duchess of Tuscany and Queen Christina of Sweden, respectively) but had no use for ordinary women practitioners of science who were formally excluded at that time from science's first institutions, the academies. Indeed, Mme Curie's granddaughter was asked to share her memory of her family of four generations of scientists, so as to provide an understandable measure of authenticity for the commemorative effort. This means that such an authenticity still came at the expense of embodying recognition of women scientists as contributors on science *per se*, because no other woman scientist contributed on science proper.

Along these lines, two other women authors in the *CI* centennial issue on Marie Curie provided curatorial compilations of Curie memorabilia and eponymic practices, thus exemplifying a traditional female occupation. Though this information, coming as it did from Polish authors dedicated to the public memory of Mme Curie as a great scientist of Polish descent, is in principle a good idea, still, in the context of the special issue it functions as an instance in which nationalist considerations trumpet considerations of gender equity. Such considerations were also evident in the inclusion of two out of four guest editors from Poland, at a time when no single woman—French, Polish, American, Japanese, etc.—was a guest editor! These four countries are most active in commemorations of Mme Curie and/or her discoveries, details of which I provided during my AAAS talk. Once again, the desire to balance Western and Eastern European guest editors—a progressive political move in the context of the European Union—came at the expense of gender balance. Must we remind these editors that Mme Curie's symbolic heritage is not limited to her being a French scientist, or a scientist of Polish descent and a Polish patriot, but also a woman scientist—indeed the best-known woman scientist. As such, her Centennial is not something that can be partitioned between France and Poland but must include respect for her gender and inclusion rather than exclusion of women in science in her Centennial events.

The last, or the only woman author ostensibly invited for her professional expertise to the special issue of *CI*, commemorating Marie Curie, i.e., unrelated to her status as family member or practitioner of traditional female occupations, was Soraya Boudia, a historian of the Curie Laboratory (Boudia, 1997, 2001). However, much as with H el ene Langevin-Joliot, Boudia was not asked to write in her own technical area of expertise, i.e., Curie's metrology, but rather to cover a *women's topic*, namely the history of Mme Curie as Head of a laboratory with many women researchers (Boudia, 2011). The implication being that a woman historian's presumed gender relevance in covering a *women's topic* outweighed the value of her technical expertise in determining the rationale for her status as an invited author.

Furthermore, though Boudia is an excellent choice for an author on Mme Curie's laboratory, asking her to write on the women in Mme Curie's laboratory further reveals the editors' lack of understanding that the history of women in science had been a designated area of historical expertise, at least since 1987 when the History of Science Society (2011) had begun to distribute awards for *outstanding research* in that field. Contrary to *CI*'s editors' superficial understanding, women scientists or women historians are not necessarily experts on the history of women in science. There is by now a sufficient body of specialized work, in both award winning books and article formats for a quarter of a century, to the effect that serious editors should first try to secure such expertise rather than using women with expertise in other fields, as if the mere fact that one is a woman makes one an expert on a specific aspect of women's history in science. To sum up, on the issue of gender and science the *CI* editors made it clear that all the women scientists from Mme Curie onward are still to be found below the radar of both *CI*, and its sponsor, IUPAC. This is a serious and disturbing conclusion to be reached during 2011, the Centennial Year of Mme Curie's Nobel Prize in Chemistry, and a mere six year since a year long public debate on women in science. It is also possible that the root cause of producing a *tribute* for Mme Curie's Centennial that ironically both embodies and promotes gender stereotypes stems from a low level of historical consciousness, or of history of science more widely, on the part of *CI* scientist editors.

The organizers of the AAAS Symposium demonstrated the supreme value of collaboration between scientists and historians in producing a spectrum of commemorative topics and speakers that included scientists, historians, and historians of science. However, *CI*'s scientist editors did not aim for a partnership with historians of science, even though a centennial is a topic that requires a specialized understanding of bridging between the present and the past, a topic that has emerged in the last decade as a sophisticated area of inquiry within the history of science. For example, collective volumes on how scientific commemorations, ranging from the quinquicentennial of Copernicus to the bicentennials of Lavoisier and the centennials of Darwin, Pasteur, Planck, Royer, among other scientists, refashioned the nexus between the past and the present, invariably under the aegis of what had become known as the *politics of public memory* have been available for over a decade in both English and French (Abir-Am & Elliott, 1999).



To conclude this disappointing encounter with *CF's* foray into Mme Curie's centennial, scientists who seek to organize anniversaries and commemorations of discoveries, discoverers, or laboratories would find it most useful to inform themselves of the pertinence of historians of science in such endeavors. Though historicity may challenge the presentist, even futurist ethos of science, ignoring it altogether has transformed an intended tribute into its very opposite, by using Mme Curie's fame as an occasion to reinforce the status quo, a status quo which means ongoing underrepresentation of women in science. Displaying ignorance of the public upheaval surrounding the underrepresentation of women in science only six years ago, as well as ignorance of scholarship in the history of science is not a professional way to celebrate the Centennial of one of the world's most accomplished and courageous women scientists.

#### *Chemical Heritage Foundation*

Several other scientific organizations that planned events for Mme Curie's Centennial also seem to suffer from a similar malaise of memory, having *forgotten* to even mention in otherwise highly publicized events that IYC-2011 was so named in honor of Mme Curie's Centennial. For example, the Chemical Heritage Foundation, (hereafter CHF) describing itself in a brochure distributed at the 2011 AAAS Annual Meeting as a "Library, Museum, and Center for Scholars" in Philadelphia, conducted several kick-off events in the first half of February 2011 to promote the International Year of Chemistry-2011 (IYC-2011, 2011). Those included a lecture, an artistic exhibition, an inaugural book club meeting and a panel with speakers from industry, business, and academia—the launch event. But nowhere was it mentioned that ICY-2011 was so declared in honor of the Centennial of Mme Curie's Nobel Prize in Chemistry as if this fact is an embarrassment rather than being a source of pride. Nor were any activities advertised so far related to addressing Mme Curie's role in combating gender bias against women in science. Apparently, CHF, whose most notable accomplishments may well be in the area of fundraising as evident from a varied list of sponsors it boasts, including corporations, individual donors, and foundations, had no time to contemplate the pertinence of Mme Curie's Centennial for its activities, or even to inform its audience that ICY-2011 was so declared because of the Mme Curie Centennial and not the other way around.

However, the CHF does highlight five women out of 11 scientists, with its theme of atomic and nuclear structure on their web site (CHF, 2011) and includes Joseph J. Thompson, Ernest Rutherford, Marie Sklodowska Curie, Irène Joliot-Curie, Frédéric Joliot, Otto Hahn, Lise Meitner, Fritz Strassman, Glenn Seaborg, Darleane Hoffman, and Helen Vaughn Michel. The CHF does not explicitly mention the Centennial of Mme Curie's Nobel Prize in Chemistry in 2011, or her visits to the radium industry in Pennsylvania in the 1920s, even though CHF in Philadelphia is mainly sponsored by the local industry with a mission to foster "an understanding of chemistry's impact on society" (CHF, 2010, p. 1).

*International Commission on the History of Modern Chemistry*

Yet another international organization, the Commission on the History of Modern Chemistry (CHMC, 2011a, 2011b) just announced its 2011 biennial symposium (Renewing the Heritage of Chemistry in the 21<sup>st</sup> Century, 2011) but has declined to include the Centennial of Mme Curie as a topic in its program. This organization is one of the Commissions associated with the International Union for History of Science and Technology (IUHST, 2011), the worldwide professional organization in that field. The only relevance between the Commission's symposium and Mme Curie's Centennial was described by CHMC's colorful program as geographical, namely, holding the meeting in Paris where Mme Curie lived her life as a scientist.

This is a disingenuous excuse, because holding a meeting in Paris does not require any special justification; moreover, the decision to do so had been taken two years earlier when the Commission met during the 23<sup>rd</sup> IUHST in Budapest for reasons related to a commission member willing to host the biennial meeting. The CHMC discovered that its upcoming meeting coincides with Mme Curie's Centennial only after Professor Margaret Rossiter of Cornell University, a leading historian of women in science, drew its attention to this fact. Still, it chose not to rectify this incredible oversight. Both the preliminary and final programs thus have no session that refers to Mme Curie's Centennial, even though her Centennial is a most suitable topic for any historical or scientific meeting held in 2011 (Symposium of the Commission on the History of Modern Chemistry, 2011).

Ostensibly the focus of the CHMC meeting in June 2011 is "Preservation, Presentation and Utilization of Sources Sites and Artifacts." In that context, the decontamination of the Curies' notebooks in the 1990s, which enabled the historians cited above to conduct original research on Mme Curie's laboratory for the first time, could have made a perfect topic. Again, Mme Curie, her Centennial, and women chemists, whether her students or otherwise, all remained below the radar of CHMC, an international commission in the history of chemistry. Much as the IUPAC's *CI*, the CHMC is yet another international body which missed the opportunity and the challenge of Mme Curie's Centennial, even at the price of making its own program less timely. Hopefully, CHMC, among other organizations whose initiatives are still in planning stages, will manage to enrich its program with topics pertinent to Mme Curie's Centennial, as well as the very idea of preserving the often neglected and little known heritage of women nuclear chemists and radiochemists.

Ironically, organizations on the history of chemistry such as the above mentioned CHF and CHMC proved more resistant to marking the Centennial of Mme Curie's Nobel Prize in Chemistry than organizations in the history of science as a whole. Thus, both the International Commission on Women in the History of Science, Technology, and Medicine (affiliated with the above mentioned International Union for History and Philosophy of Science) and the History of Science Society (2011) in the US currently plan symposia on Mme Curie's centennial. While the former circulated a call for paper in April 2011 with Mme Curie's Centennial being one of its five themes at its biennial meeting in Paris in September 2011, the latter had

already approved a proposed session with five participants for its November annual meeting. In both cases the initiative came from women historians who specialize in the history of women in science; this outcome raises the issue of whether men scientists and scholars, who form the majority of practitioners in both science and history of science, are willing and able to commemorate the contributions of women scientists, or are they more interested in maintaining the status quo, relegating both women scientists and their *female topics* to the margins of both science and its commemorative practices?

#### PROTESTING THIS STATE OF AFFAIRS

Given all these examples, one wonders why some of the above organizations, and probably others (IUPAC's upcoming meeting in Puerto Rico late in July 2011 boasts the presence of seven Nobel Laureates but does not have, as yet, anything on its preliminary program that pertains to Mme Curie's Centennial), tend to hide or play down the fact that the International Year of Chemistry-2011 (IYC-2011) was declared in honor of the Centennial of Mme Curie's Nobel Prize in Chemistry. Readers may remember the numerous events scheduled during 2005 to mark the centennial of Mme Curie's friend, Albert Einstein (Fox & Keck, 2005), especially his multiple-discovery *annus mirabilis* of 1905 (much as 1898, had been for Mme Curie, the year she discovered radium and polonium in collaboration with Pierre Curie (see Nobelprize.org, 2011).

The identity of the discoverer, Einstein, was not hidden at all, quite the contrary, it bordered on a cult of scientific personality! So why does this double standard continue to exist a quarter of a century after the History of Science Society began formally recognizing excellence on the topic of the history of women in science (in 1987), and four decades after the passage of affirmative action executive orders and legislation in the mid-1960s and early 1970s, respectively, in the US (Affirmative action, 2011)?

Could it be that those organizations ignore the name of Mme Curie in the year of her Centennial (IYC-2011) in order to avoid addressing the issue of underrepresentation of women in science—an issue that inevitably highlights those organizations' ongoing practices of gender inequality? Is this widespread denial of institutional responsibility for the underrepresentation of women in science a generational issue, stemming from the slow to die attitudes of an earlier generation of Cold War scientists who always knew that the best place for a woman scientist was someone else's laboratory?

The convergence of these three *offenders* (CI, CHF, and CHMC) was thus experienced as a rude awakening, coming as it did on the heels of the AAAS symposium. That symposium, as noted above, was not only a model commemorative event but was also well received by its audience, suggesting in a way that the message on the historical role of women in science was being absorbed. But it suddenly became obvious that there are still large pockets of colleagues, and their organizations, which despite a quarter of a century (and more) of professionally rewarded outstanding research on women in science, they remain uninformed about

the historical place of women in science or the social urgency of addressing the underrepresentation of women in science.

What can one do in such a demoralizing situation? As a scholar and community builder in the area of the history of women in science, I felt that all my efforts in the last quarter of a century as well as those of my colleagues in various collective volumes and other venues were in vain. This counting started in 1986 when the 12-author book I co-edited, *Uneasy Career and Intimate Lives: Women in Science, 1789–1979* (Abir-Am & Outram, 1987) went to press—the book won a History of Science Society award for outstanding research in 1988.

The idea of protesting this state of affairs, i.e., of either ignoring or downplaying the status of women in science, was inspired by having already included in my PowerPoint presentation at the AAAS Symposium, a slide on the centennial of Émile Zola's (2011) *J'accuse...!* a letter of protest, written to the President of the French Republic and other organs of state and published in the newspaper *L'Aurore* on January 13, 1898. It remains the most famous public appeal in modern times. The letter was concerned with the miscarriage of justice in the case of Captain Alfred Dreyfus who was falsely accused of treason and imprisoned. I referred to Alain Pages' (1998) book as an example of the wider cultural context of the centennial of the discovery of radium because both centennials took place in 1998. As I put it, on their way to and from the laboratory in which radium was discovered, the Curies would have heard Zola's petition being read on many Parisian street corners.

Zola's petition changed the world, giving rise to the concept of the public intellectual, in addition to stimulating far-reaching political ramifications within and beyond France. Those far-reaching changes included a long-lasting dichotomy in the political map of France between Dreyfusards and their opponents, well into the Fifth Republic. Those far-reaching changes also included the idea that European Jews, as a quintessential minority, may need to seek individual civil rights at a collective rather than at the individual level (as the Third Republic so famously failed to defend the civil rights of Captain Alfred Dreyfus—a member of a minority group). Within half a century, that idea led in 1948 to the establishment of Israel (Sachar, 1976; 3<sup>rd</sup> ed., 2007)—in itself a transformative event for the geopolitics of the Middle East as well as for the civil rights of Jews and other minorities worldwide.

Moreover, having been affiliated for the last several years with the Women's Studies Research Center (WSRC, 2011) at Brandeis University (whose motto is "Scholarship, activism, and art") I let the readers, much as the AAAS attendees did beforehand, judge whether my jocular efforts at satirizing the distortion of Mme Curie's public memory so as to fit gender stereotypes qualify as a form of art... at the very least it made the audience laugh on several occasions as if it was exposed to a comic performance. This Brandeis interdisciplinary center exposed me to efforts of other colleagues in promoting a wide variety of gender-related public causes ranging from freedom of speech to wage equality, by a wide variety of means, including such petitions.

It remains to be seen whether the proposed petition on mandating and monitoring an adequate representation of women scientists in the programs of scientific commemorations, or any other scientific symposia and events, may also change the

world by bringing science, the most influential institution of our time, closer to accepting the ideal of gender equality.

#### NOSTALGIC MEMORIES STIRRED AT 2011 AAAS ANNUAL MEETING

In this respect, the 2011 AAAS Annual Meeting proved encouraging because its outgoing President, Alice Huang of California Institute of Technology, mentioned the status of women in science as a key issue in her Presidential Address (Huang, 2011). She also told me during the reception afterward that she was happy to see that our symposium was well placed at the beginning of the AAAS Program. She seemed more aware of the reality for women in science both in the past and nowadays, than many scientists, both men and women, who become distinctly uncomfortable when the topic of the underrepresentation of women in science is mentioned. It was also interesting to compare notes with her on well known case studies of gender discrimination in the recent history of women in science—cases I know from my research as a historian of science but she knew from personal encounter with those involved.

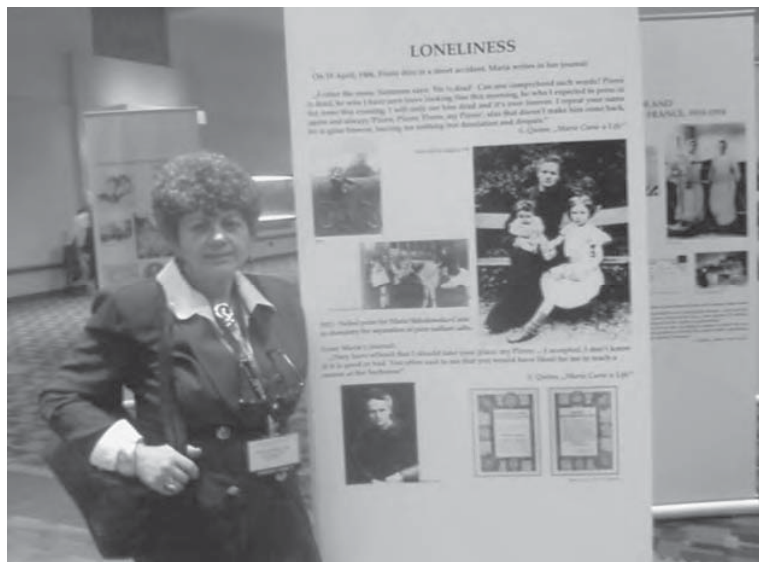
Other colleagues involved in the issue of the underrepresentation of women in science that I was able to meet at the AAAS meeting included Sue Rosser, the Provost of San Francisco State University (SF State News, 2009), who was elected to the AAAS Board of Directors in 2010 (SF State News, 2010). She was a principal architect of NSF-POWRE (a program that preceded the current NSF-ADVANCE grants) (Rosser, 2004; Rosser & Taylor 2009), which still stirs in me a great deal of nostalgia. Among other things, I was reminded of an eventful flight to a POWRE awardee meeting at NSF headquarters in the late 1990s, from my then location at University of California, Berkeley, in the company of my by then 10-year old daughter. She informed all in the airport that if she would not get upgraded to first class, then her mother was a bad one. Too bad the *New York Times*, which covered that meeting, missed such telling comments about balancing work and family a century after Mme Curie balanced her discovery of radium with taking care of one year old Irène, who like her mother would also become a Nobel Laureate in Chemistry (Nobelprize.org, 1935).

Nostalgia also applied to opportunities given to the topic on women in science by AAAS on previous occasions. On one such occasion, the 1989 Annual Meeting, we also had a symposium on women in science, entitled “Uneasy careers and intimate lives – Great women in science during the late 1800s and the 1900s,” (History of Physics Newsletter, 1988), co-organized by Caroline L Herzenberg of Argonne National Laboratory and me, and chaired by Professor Stephen Brush of the University of Maryland at College Park, a former President of the History of Science Society who has written one of the early essays on women in science (Brush, 1985). A *New York Times* science journalist (Norman, 1989) covered our symposium in *Science*. It not only included quotations from my own talk but also our coverage was published in parallel with that of the AAAS Presidential Address! Then, as now, the topic of women in science has remained timely because change toward gender equity has remained slow (Valian, 1999), though perhaps the sense of urgency which gave

us top coverage in 1989 has disappeared in the aftermath of the 2005 year-long debate on women in science, which saturated anyone’s appetite for coverage. That unusual coverage, prompted in part by the *celebrity* status of some participants in the debate, and other factors beyond its core issue of gender inequality, contrasted with the paucity of actual or meaningful policy action.

Let’s hope that those who wish to speed such change will sign the enclosed petition, while those who organize scientific commemorations, or other symposia, will remember or otherwise be reminded by their organizations’ bylaws, to be inclusive of women in science, whether as speakers, organizers, or *mere* topical presences. How Mme Curie’s Centennial is marked by science and society in 2011 remains a sensitive barometer of their determination, or lack of it, to solve the problem of the underrepresentation of women in science. Mme Curie’s Centennial is a perfect timing for house cleaning of vestiges of sexism, so as to engage now in a concerted action by a combination of science policy and social policy for women in science—an idea advanced almost two decades ago (Abir-Am, 1992).

FIGURE AND LEGEND



*Figure 1. Author, Pnina G. Abir-Am, shows one frame of the poster display at the 2011 AAAS annual meeting in Washington, DC on Marie Curie’s life. The largest photograph on this particular poster is of Marie Curie, taken with her two daughters, with infant Eve on her lap and Irène sitting beside Marie.*

NOTES

- <sup>1</sup> Fred Sanger (1958, 1980 in chemistry) and John Bardeen (1956, 1972 in physics) are the only other scientists who twice received a Nobel Prize in science. Linus Pauling received a 1954 Nobel Prize for Chemistry and a 1962 Nobel Prize for Peace. See also [http://nobelprize.org/nobel\\_prizes/nobelprize\\_facts.html](http://nobelprize.org/nobel_prizes/nobelprize_facts.html) for the number of scientists who received a Nobel Prize since its inception in 1900, per field.

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#### APPENDIX A

Petition for mandating inclusiveness of women in the Mme Curie Centennial and related symposia

2-28-2011

Dear Colleague,

As you may know, *various efforts* are currently under way to honor the centennial of Mme Curie's Nobel Prize in Chemistry (1911) this year, declared the International Year of Chemistry-2011 (IYC-2011) by UNESCO. This is a great opportunity to reflect upon the progress that Mme Curie's discovery of two new elements, radium and polonium, made in combating social *bias and barriers* both she and other women scientists and scholars have encountered and still do.

We were very disappointed that some early efforts marking this Centennial seemed to *reinforce gender stereotypes*. For example, the January-February 2011 issue of Chemistry International (*CI*), an IUPAC official magazine, featured *no* woman scientist among its four guest editors of its special issue on the centennial of Mme Curie. By comparison, no anniversary issue honoring Martin Luther King would be published without an African-American guest-editor! The *only* woman scientist contributor in that issue is Curie's granddaughter scientist who reminiscences about her family! *CI* further limited its selection of three other women contributors to traditional female occupations or topics. Eight men authors are the only ones in charge of scientific aspects. Such gender stereotypes suggest that the actual purpose of its tribute may not be to honor Mme Curie *but rather use her Centennial to reinforce the status quo* of underrepresentation of women in science. Not including women scientists among the eight men scientific contributors sends the wrong message worldwide; it falsely implies that there are *no* worthy women scientists to be included in a tribute to the best-known woman scientist.

This occurred rather soon after the yearlong public debate on the underrepresentation of women in science, dubbed the "debate that will not go away" (*New York Times*, May 12, 2005). It just resurfaced in the February 7, 2011 issues of the *Chronicle of Higher Education* and the *Proceedings of the National Academy of Science*. We conclude that if left to their own devices, leaders of public

opinion in science would fail to include their women scientist colleagues, most ironically even when they claim that they seek to honor Mme Curie.

In order to ensure that all scientific anniversaries reflect both gender inclusiveness and desegregation of women from a sole association with traditional women's topics (e.g., family, traditional occupations) we call upon pertinent scientific and other organizations to adopt an *official policy of monitoring* that the *representation* of women scientists and scholars among all ranks of invited contributors and all kinds of topics *is adequate*.

The petition will be addressed at organizations for their planning special events or publications on the Centennial of Mme Curie's Nobel Prize in Chemistry in 1911. Please return your signed copy to the first signatory below at pninga@brandeis.edu (sample of signatories follows below).

Your name, position, institution, and comments, if any:

- Dr. Pnina G. Abir-Am, Resident Scholar, WSRC, Brandeis University, "Women's greatness should not be ignored or hidden!"
- Dame Gillian Beer, Professor Emeritus, Cambridge University, "Marie Curie is an icon but not alone among women."
- Joy Harvey, Independent Scholar, Somerville, MA.
- Prof. Rusty Shteir, Chair, Women's Studies, York University, Toronto
- Prof. V. Betty Smocovitis, Zoology & History, University of Florida at Gainesville

*Pnina G. Abir-Am*  
*Resident Scholar, Women's Studies Research Center*  
*Brandeis University*