H-Net Reviews
in the Humanities & Social Sciences

Maria Rentetzi. *Trafficking Materials and Gendered Experimental Practices: Radium Research in Early 20th-Century Vienna.* New York: Columbia University Press, 2008. xxiii + 279 pp. $60.00 (cloth), ISBN 978-0-231-13558-0.

Reviewed by Tatjana Buklijas (The Liggins Institute, University of Auckland)
Published on HABSBURG (January, 2010)
Commissioned by Jonathan Kwan

Science and Gender in a Transforming City

This is a wonderful time for the history of science and technology in the Habsburg Empire. Long neglected and dominated by a traditional internalist approach, over the past several years it has been energized by young scholars who have combined careful research of primary sources with approaches borrowed from various fields. For instance, studies of Galician oil exploitation[1] and of the intermeshing of private and public lives of a Viennese physics dynasty[2] have shown how economic history, in the former case, and the critique of the Schorskian model of 1900 Vienna, in the latter, may be profitably used to illuminate history of science and technology, and vice versa. Maria Rentetzi's book offers an equally innovative, stimulating, and carefully researched study that brings together urban transformation, politics, gender studies, a study of disciplinary material culture, and a history of a scientific discipline. Drawing on an extremely wide range of primary sources (located from Vienna to Miami and Mexico), it shows how the experimental culture of radium research that developed in early twentieth-century Vienna crucially depended on the status of radium as both a commodity and a subject of scientific study in addition to close personal and institutional proximities within the *Medizinerviertel* as well as the gender politics of Red Vienna.

The book follows the history of the Radium Institute (Institut für Radiumforschung) in Vienna from its establishment in 1910 until the political, personal, scientific and institutional upheavals of the 1930s and 40s. The final chapter, a post-scriptum of a kind, focuses on the postwar career of the émigré scientist Marietta Blau. The book opens with a panoptic view of radium research and industry around 1900. Placing radium at the center of inquiry, Rentetzi defines this novel and highly valuable substance as a "trafficking material": changing hands, institutions, disciplines; in the possession of scientific, social, economic and even patriotic value; and able to "take on multiple identities, not because they are shared between different worlds but because they are transferred across them" (p. 3). But the effects of radium were far from subtle: the combination of physical and chemical methods in the pioneering Curie Paris laboratory disrupted the boundaries between these disciplines, and the early descriptions of radioactive decay or atomic transmutations' destabilized the periodical system and the atom, both previously deemed immutable. Austria-Hungary's entry into the field was based on the access to pitchblende, radioactive ore containing radium and uranium, in St. Joachimstal (Jáchymov) in Bohemia, the key European radium supplier at the time. By persuading the government to seize control of the export of uranium and by negotiating privileged access to and funding for radium, Austrian scientists secured the foundations for their research and established an important position for themselves within international networks.

Originally located in makeshift premises in the Physics Institute in Türkenstrasse, the institute director, Franz Serafin Exner, soon secured a donation from the wealthy businessman and patron of science and medicine Karl Kupelwieser for a purpose-built institute. It is impressive how, in the second chapter, Rentetzi uses the close analysis of the building of the new institute to show how disciplinary requirements shaped the architecture, but also how the gender politics of the early twentieth century and the urban setting influenced disciplinary practices. By providing insight into "details," such as female toilets in the institute and regular social gatherings in the library (instead of, perhaps, a café), Rentetzi paints a vivid picture of a liberal environment open to female staff under the benevolent leaderships of Exner (the formal *Vorstand*) and the *Leiter*, Stephan Meyer.

A core part of Rentetzi's argument is that the "sociospatial setting" influenced careers and research programs of radium scientists, which she shows by dis-

cussing the geography of the *Medizinerviertel*. This part of the ninth district, Alsergrund first developed into the urban academic center around medical institutions such as Allgemeines Krankenhaus and Josephinum in the late eighteenth century, to become later the center of Viennese academe more generally. Medicine, an early and prominent user of radium, played an important role in fostering radium research worldwide. But in Vienna this impact was further magnified by medicine's dominant role in the development of natural sciences. This argument, implied rather than explicit, is to my knowledge original and worth exploring further. While we have extensive literature on the origins of the rise of natural sciences in German states–ascribed, variously, to the philosophical commitment to *Bildung*, an active academic market system, and burgeoning industry, we lack a similar study for Austria.[3] Medicine's dominant role was materialized in the physical setting of natural science institutes that all congregated around medical institutions. These spatial proximities and the "trafficking" nature of radium fostered cross-disciplinary research collaborations. They also, as shown in the illuminating portraits of Stefanie Horovitz and Marietta Blau, helped young middle-class women, often Jewish, break institutional obstacles towards a scientific career.

But geographical proximities alone do not suffice to explain the prominent role of women in the Viennese institute. Rentetzi engages with an older argument claiming that women "seemed to play a disproportionately large share in the research work in radioactivity compared to other fields of physical sciences" (p. 99). She shows that there were just two radium institutes with unusually high number of women: Marie Curie's laboratory and Vienna. Although the Viennese institute was comparatively open to female participation even before 1918 (thanks to Exner and Meyer, and due to the marginality of a new field), the dramatic change happened only under Social Democrat rule of the city (1919-1934), in "Red Vienna." Between 1920 and 1934, thirty-two of all the individual authors of papers published by institute personnel were women and sixty-six were men; women were more productive overall. The massive social experiment aimed at creating a socialist *Neuer Mensch*–intervening into work, educational opportunities, housing, and free time–influenced science too. Women were highly represented not only in radium research but also in other new municipally and privately funded scientific institutions; indeed, these institutions came to form a social and professional network that brought together radium researchers, psychologists of the *Kinderübernahmestelle* (also in the ninthdistrict), Vivarium biologists, and doctors from the Lainz hospital. But the financial position of these institutions was also far more precarious than that of the conservative university, whose employment politics was markedly different from that of the Vienna's city council. The persistent attempts of the Swedish physicist Hans Pettersson, who in the 1920s occupied a leading research role in the institute, to secure funding against the unfavorable national and international environment illustrate this clearly.

How did this idiosyncratic gender politics affect the local experimental culture and the international reception of Viennese radium research? The answer is provided by a close examination of the controversy between Vienna and Ernest Rutherford's Cambridge laboratory, which emerged around the results obtained by observing flashes produced by the scintillation counter, an instrument designed to measure artificial disintegration. Constructed originally in Cambridge, the instrument was transferred to Vienna, modified, and then used, only to produce results that differed from those of the Rutherford laboratory. Attempts towards resolving controversy–through publications, discussions, and visits by Cambridge scientists to Vienna–reveal, as Rentetzi argues, "a shift in the epistemological meaning of the concept of skill from an objectively quantifiable quality to an ideological category assigned to men and women on the grounds of gender bias" (p. 161). While at Cambridge counting flashes was treated as a highly skilled task, when done by Viennese "girls" it was (in the eyes of English scientists, and, later, some historians) demoted to a routine performance.

Final chapters examine the post-1934 transformation of the institute. The unfavorable end to the scintillation counter controversy finished the research program, the field moved internationally from radioactivity to nuclear physics, and the end of the Red Vienna deeply affected the networks, working style, and relationships in the institute. While Nazi pressure post *-Anschluss* was not as strong at a purely research institute as at teaching departments of the university, staff whose politics and ethnicity did not fit the new regime had to leave. Their émigré fates outside the protective shell of the Radium Institute were not easy, as portraits of Elizabeth Rona and Marietta Blau demonstrate. In particular the career of Blau, surviving "on the margins of nuclear and particle physics," suffered (p. 227). Twice nominated for the Nobel Prize, she was overlooked both times, possibly because–reminiscent of the gender-based assumptions underlying the Cambridge-Vienna controversy–her work was always seen as a technical perfection of something extant rather than as innovation.

While the content of the book and the research that went into it deserve high praise, technical features deserve some criticism. This printed edition is a "partial representation" of the electronic (html and pdf) book (http://www.gutenberg-e.org/rentetzi/), published online in 2007 as part of the 2003 Gutenberg-e Prize (http://www.gutenberg-e.org/aboutframe.html). The prize was awarded by the American Historical Association in conjunction with Columbia University Press and with Andrew Mellon Foundation funding. The Gutenberg e-Prize initiative (http://www.gutenberg-e.org) bravely engaged with two important contemporary issues: the unstoppable rise of electronic media and the difficulties that young scholars encounter when trying to publish their first books. The initiative lasted from 1999 until 2003 and it ended mainly because of the cost and the mixed reception of exclusively electronic books in the historical community. It seemed that libraries still preferred a print copy, journals were not keen on reviewing online publications, and readers found traditional books more convenient.

The 2008 print publication of Rentetzi's book thus seems like a necessary compromise, but the electronic and print editions differ: the print edition contains the text, notes, bibliography, tables, and charts, but not the images, maps, or index. Using solely the print edition, while possible, offers a diminished experience; for this review, I referred to both. Much of Rentetzi's argument concerns how social and scientific networks of radium scientists emerged out of the spatial proximities in the *Medizinerviertel*. For the reader unfamiliar with the topography of Vienna, a map would have been helpful. Similarly, the discussion of the effects of spatial arrangements in the institute on scientific practices and scientists' careers is helped by the examination of architectural sketches and blueprints. For these, the reader must refer to the electronic version (http://www.gutenberg-e.org/rentetzi/media2.html).

In addition to maps and blueprints, the electronic version contains a wonderful collection of photographs: individual and group portraits as well as photos of buildings, instruments, and laboratory environments. But most captions are disappointing and they seem to deteriorate in the latter chapters of the book, as if the author were in a hurry to finish. For instance, in the majority of the portraits showing individual scientists in their workplace, we never learn the name/type of the instrument(s) with which they are pictured, what were they doing, why they were photographed with that device, etc. I appreciate that some of this information may be hard to access, but surely an expert in the history of the institute such as the author would have been able at least to make some informed guesses. The lack of attention in the use of photographs is even more striking when compared to Rentetzi's careful handling of the previously mentioned blueprints and city maps, analyzed in the texts of chapters 2 and 3. If handled differently, the images would have been not just illustrations but rather sources as equally valuable as the rich textual material that Rentetzi uses.[4] My last niggle concerns the proofreading of the text: it seems that typos (not rare), citations (for instance, citing Coen's PhD dissertation although the book was published in 2007), and minor errors (for instance, it is Vera Horvat Pintaric–double surname, not Horvat Pintaric; "Ministry of Culture and Education" is not a good translation for the Ministerium für Kultus und Unterricht) have not been corrected between the electronic and print editions. In short, it is a pity that the high price of the print edition (US $60 on Amazon!) is not justified by the publication of at least a selection of pictures and another round of careful proofreading.

These complaints should not, however, detract much from this overall excellent piece, which should be read historians of science as well as modern Austrian historians, especially those with an interest in gender.

Notes

[1]. A. Fleig Frank, *Oil Empire: Visions of Prosperity in Austrian Galicia* (Cambridge, Mass.: Harvard University Press, 2005).

[2]. D. R. Coen, *Vienna in the Age of Uncertainty: Science, Liberalism and the Public Life* (Chicago: University of Chicago Press, 2007).

[3]. See R. S. Turner, "The Prussian Universities and the Research Imperative, 1806-1848" (PhD diss., Princeton University, 1973); on academic markets, see J. Ben-David, *The Scientist's Role in Society* (Englewood Cliffs, NJ: Prentice-Hall, 1971); and A. Zloczower, *Career Opportunities and the Growth of Scientific Discovery in Nineteenth-Century Germany, with Special Reference to Physiology* (New York: Arno Press, 1981); on the politics of professorial appointments and disciplinary development at German universities, see Lynn Nyhart, *Biology Takes Form: Animal Morphology and the German Universities, 1800-1900* (Chicago: University of Chicago Press, 1995); on industry, state, and natural sciences in Baden, see A. M. Tuchman, *Science, Medicine and the State in Germany: The Case of Baden, 1815-1871* (New York: Oxford University Press, 1993).

[4]. For a successful example of a study of a portrait of scientists, see for example S. de Chadarevian, "Portrait of Discovery: Watson, Crick, and the Double Helix," *Isis*,

94 (2003): 90-105; see also L. Jordanova, *Defining Features: Scientific and Medical Portraits, 1660-2000* (London: Reaktion Books, 2000).

If there is additional discussion of this review, you may access it through the list discussion logs at:
http://h-net.msu.edu/cgi-bin/logbrowse.pl.

Citation: Tatjana Buklijas. Review of Rentetzi, Maria, *Trafficking Materials and Gendered Experimental Practices: Radium Research in Early 20th-Century Vienna.* HABSBURG, H-Net Reviews. January, 2010.
URL: http://www.h-net.org/reviews/showrev.php?id=25381

This work is licensed under a Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 United States License.