

Crafting Scientific (Auto)Biographies

Study the historian before you begin to study the facts.¹

Edward H. Carr

It may be difficult for those removed from the mores of the scientific community to understand the enormous reticence with which anyone, especially a woman, would make public his or her personal impressions and experiences [...]. To do so is not only considered unprofessional, it jeopardizes one's professional image of disinterest and objectivity.²

Evelyn Fox Keller

This is a book on women and men's lives in science, introducing the subject of autobiography regarded as a tool for historians of science. On the latter point, the book restricts itself to calling the attention of historians and science studies scholars³ to the role that the gender of the biographer, and that of his or her biographee, may have in the process of writing a biography.

There are very many features in play in the 'special relation' established between the biographer and his or her biographee, and they will change according to time and space. Whether the biographee is alive or dead,⁴ it is a relation between human beings played out among the articulations of a network that is professional and social, as well as personal and biological, as in 'real' life. Historians having always been suspicious of autobiography – 'autobiography by its very nature is [...] something of a scandal for the historian'⁵ – but from the

* For his encouragement, for our discussions on lives and on science, a special thank you goes to Giuliano Pancaldi, as always.

1 Edward H. Carr, *What is History?* (New York: Vintage Books, 1961), p. 26.

2 Evelyn Fox Keller, 'The Anomaly of a Woman in Physics', in *Working it Out: 23 Women Writers, Artists, Scientists, and Scholars Talk About Their Lives and Work*, ed. by Sara Ruddick and Pamela Daniels (New York: Pantheon, 1977), pp. 71 – 91 (p. 91).

3 The developments in recent decades enable me to use the expressions 'science studies scholars' and 'historians of science, technology and medicine' as equivalents; at any rate, this is how I use them here.

4 On the experience of writing about living scientists, see Soraya de Chadarevian, 'Using Interviews to Write the History of Science', in *The Historiography of Contemporary Science and Technology*, ed. by Thomas Söderqvist (Amsterdam: Harwood Academic Press, 1997), pp. 51 – 70; Nathaniel C. Comfort, 'When Your Sources Talk Back: Toward a Multimodal Approach to Scientific Biography', *Journal of the History of Biology*, 44 (2011), 651 – 69.

5 Jeremy D. Popkin, *History, Historians, and Autobiography* (Chicago: University of Chicago Press, 2005), p. 11. For ego-histoire and autobiography, essential to begin with are: *European Ego-Histories: Historiography and the Self, 1970 – 2000*, ed. by Luisa Passerini and Alexander C.T. Geppert, vol. 3 of *Historein: A Review of the Past and Other Stories* (Athens: Nefeli

1980s, when Pierre Nora challenged some colleagues to engage with what he called *ego-histoire*,⁶ the subject has been explored with growing interest.⁷ Not only have some of the leading historians of the twentieth century engaged with autobiography in relation to the historian's craft, but also scholars in other sectors have, including economists.⁸ This apparently does not apply to historians of science, who seem to suffer from a certain uneasiness when faced with biography as a genre.

Nevertheless, it is beyond dispute that over the past two decades scientific biography has significantly changed its role in the history of science, technology, and medicine. The need to re-examine the potential and the limits of the biographical genre in the sector of science studies arose in particular from the publication of biographies which showed themselves capable of successfully penetrating the complexity of creative processes and discoveries. In some cases, biography revealed itself well suited to trying out new approaches to the study of science and scientists. Historians of science have moved freely from biography in context to existential biography, and from the biography of scientific objects to metabiography. Thanks also to a not always easy dialogue with professional writers and the emergence of the so-called 'Sobel effect', for people working on science, its history and its social relations biography is now a flexible tool, encompassing genres ranging from textual analysis to the in-depth survey of field and laboratory work, from contextual reconstruction to subtle debate over historiography.⁹ This should lead us to consider that the relations between men

Publishers, 2001); *Economists' Lives: Biography and Autobiography in the History of Economics*, ed. by E. Roy Weintraub and Evelyn L. Forget (London: Duke University Press, 2007).

6 See the classic *Essais d'ego-histoire: Maurice Agulhon, Pierre Chaunu, Georges Duby, Raoul Girardet, Jacques Le Goff, Michelle Perrot, René Rémond*, réunis et présentés par Pierre Nora (Paris: Gallimard, 1987).

7 Jeremy D. Popkin, 'Ego-histoire and Beyond: Contemporary French Historian-Autobiographers', in the special issue 'Biography', *French Historical Studies*, 19 (1996), 1139–167.

8 For a wide-ranging discussion of the subject, and a wealth of biographical references, see *Women Medievalists and the Academy*, ed. by Jane Chance (Madison: The University of Wisconsin, 2005). I would like to thank Gianna Pomata for referring me to this book, which provides biographical profiles of women medievalists active between the seventeenth century and the present, and which closes with an autobiographical essay by medieval historian Caroline Walker Bynum.

9 In addition to other biographies cited in the course of this book, see: John L. Heilbron, *The Dilemmas of an Upright Man: Max Planck as Spokesman for German Science* (Berkeley: University of California Press, 1986); Frederic L. Holmes, *Hans Krebs: The Formation of a Scientific Life, 1900–1933* (New York: Oxford University Press, 1993); Janet E. Browne, *Charles Darwin: Voyaging. Volume 1* (New York: Knopf, 1995), and Ead., *Charles Darwin: The Power of Place. Volume 2* (New York: Knopf, 2002); Giuliano Pancaldi, *Volta: Science and Culture in the Age of Enlightenment* (Princeton: Princeton University Press, 2003); Massimo Mazzotti, *The World of Maria Gaetana Agnesi, Mathematician of God* (Baltimore: Johns Hopkins University Press, 2007); Nicolaas A. Rupke, *Alexander von Humboldt: A Metabiography* (Chicago: University of Chicago Press, 2008).

and women biographers and men and women biographees may deserve more attention than they have received so far.

To provide orientation in such a challenging field, this book offers examples of how autobiography can be functional to science studies, providing examples we may regard as ‘pragmatic’¹⁰ for those approaching writing about men and women’s lives in science; examples showing how to overcome or control the risks – and reveal the advantages – offered by the relation between the self narrating and the biographee. The question we will be addressing is: to what extent does my personal, professional, and social experience – including my gender – matter in the image I am conveying of the scientist I’m writing about? We offer food for thought, though no final answer, on this question; a question we suggest should be left open, and in a prominent place, on our desks.

Veterans of the so-called science wars, historians of science, and science studies scholars should no longer be afraid of embarrassing issues – ‘considered unprofessional’, as Evelyn Fox Keller recalls in our opening quotation – when making incursions into the ‘personal’ in relation to writing history.

With these aims in mind, Pnina G. Abir-Am, Georgina Ferry, Paula Findlen, Evelyn Fox Keller, and Londa Schiebinger have accepted the challenge of writing of their own professional (and also personal) experience, inter-weaving it with reflections on the case studies they have been working on. Together with essays by Vita Fortunati, from literary studies, Zeldia A. Franceschi, an anthropologist, and historians of science Marta Cavazza, Paola Govoni, and Massimo Mazzotti, the book presents some of the ways a biographical approach may help us understand, together with lives in science, the science itself. Concluding remarks by Franceschi will offer the perspective of an anthropologist on the use of (auto) biography and (hi)story telling.¹¹

The authors represent different generations, as well as different disciplines. The time span opens with the extraordinary, internationally well-known case of natural philosopher Laura Bassi (1711 – 1778), the first woman to have obtained a tenured professorship of physics in 1732, and concludes with the just as important case of Elizabeth H. Blackburn (1948 –) and Carol W. Greider (1961 –), the first women’s team to have won a Nobel Prize in 2009.

10 I am here applying to autobiography the ‘pragmatic’ approach to biography spoken of in Peter Hainsworth and Martin McLaughlin, ‘Introduction’, in *Biographies and Autobiographies in Modern Italy: A Festschrift for John Woodhouse*, ed. by Peter Hainsworth and Martin McLaughlin (London: Legenda, 2007), pp. 1 – 6.

11 For an interesting point of view on this latter subject, see Helga Nowotny, ‘How to Tell a Story in the Sciences: Settings and Lessons’, in *Science, History, and Social Activism: A Tribute to Everett Mendelsohn*, ed. by Garland E. Allen and Roy MacLeod (Boston: Kluwer, 2001), pp. 123 – 35.

I. Positioning Biography and Autobiography within the History of Science

In all research areas the status of the biographical genre was at a low ebb in the 1960s. It was in the following decade that specialist books and articles of scholars in various fields began to examine and evaluate biography as a genre, and the relations between the self doing the research and the self researched began to be explored. As evidence of the new wealth of possibilities offered by biography, and of the novelty of the phenomenon which at once attracted the interest of the lay public, in the 1980s the term ‘life-writing’ became current. By life-writing is meant that universe of narrative forms – both academic and other – which today includes memoirs, journals, letters (including emails), autobiographical fiction and poems, and even auto-ethnicity. It is the concrete character of life histories, where readers’ voyeurism and writers’ exhibitionism merge, which has appealed to both specialists and amateurs, convincing publishers that cultural interests and the market can be reconciled. So, while historians of science have found at least seven different ways of making and using biography,¹² scholars in the field of literary studies have described sixty different genres of life narrative.¹³ In an editorial of *Life Writing*, a specialized journal founded in 2004, autobiography and biography are recognized as the most popular form of storytelling of our times.¹⁴ Scientists themselves have contributed to the debate, not only the anthropologists Franceschi deals with here, but also biologists.¹⁵ To give a brief summary of a rich and fascinating international debate covering at least three decades, we may say that biography has earned the status of an analytical tool, without losing the popular characteristics that have made it one of the genres most appreciated by the lay public from as far back as the Victorian age.¹⁶ Yet,

12 Thomas Söderqvist, ‘The Seven Sisters: Subgenres of ‘Bio’ of Contemporary Life Scientists’, *Journal of the History of Biology*, 44 (2011), 633 – 50.

13 Sidonie Smith and Julia Watson, *Reading Autobiography: A Guide to Interpreting Personal Narratives*, 2nd ed. (Minneapolis: University of Minnesota Press, 2010), see in particular chapter 9 and Appendix A.

14 Mary Besemeres and Maureen Perkins, ‘Editorial’, in *Life Writing*, 1 (2004), vii-xii (p. vii).

15 See Marianne Horsdal, *Telling Lives: Exploring Dimensions of Narratives* (Oxon: Routledge, 2012).

16 On this, see for example the aims and activities of the Oxford Centre for Life-Writing, OCLW, and the Arvon Foundation. OCLW, based at Wolfson College, Oxford, ‘provides a natural home for life-writing’, and connected to the Society are scholars – the president is Hermione Lee – and practitioners of life-writing from the University of Oxford and further afield, among whom Georgina Ferry. See <https://www.wolfson.ox.ac.uk/clusters/life-writing> (for this and the sites that follow, the date of the last access is 9/12/2013). The aim of the Arvon Foundation is ‘to promote the transforming power of writing’ and it is directed at amateurs. See Sally Cline and Carole Angier, *The Arvon Book of Life Writing: Writing Biography, Autobiography and Memoir* (London: Methuen Drama, 2010). Among the numerous, in-

while the debates on biography have occasionally involved historians of science through significant interventions,¹⁷ the same cannot be said with reference to autobiography or ego-histoire.

Academic biographer Lyndall Gordon has written that ‘the real subject of biography is always going to be yourself, some aspect of your personality, some reflection of what’s happening in your life at the time you’re writing the book.’¹⁸ Science writer, journalist, and biographer Georgina Ferry in her essay in this book tells of her beginnings as the biographer of Dorothy Hodgkin, the only English woman scientist to have been awarded the Nobel Prize, and who no professional historian of science had ever been interested in before.¹⁹ Ferry writes that among the reasons that led her to the undertaking there was also the need at that time to find answers to her own personal issues: how had Hodgkin, at those levels of excellence, managed to combine family, research, and her commitment to social activism? This was only superficially a simple matter, leading her research straightaway into personal, institutional, and social contexts which are the same, if ‘narrated’ differently, as those probed by historians of science. Abir-Am, in her essay here, goes further in the same direction with radical clarity. To Abir-Am, the stories of Ellen Daniell, ‘the first woman to be hired and fired by the department of Molecular Biology at the University of California’, and of Blackburn and Greider, the first woman’s team to share a Nobel Prize, tell of generations of women scholars very close to each other and in part overlapping, though experiencing very different professional outcomes. Their stories ‘are also our story – writes Abir-Am – the story of women historians of science who write about women scientists [...] as a way of better understanding not only science in history but also our own generation’s slow

teresting observations of professional writers on these subjects, see Michael Holroyd, *Works on Paper: The Craft of Biography and Autobiography* (London: ABACUS, 2002); ‘Q&A: Georgina Ferry on Writing Biography’, *Nature*, 463 (2010), 1025 (<http://www.nature.com/nature/journal/v463/n7284/full/4631025a.html>).

17 I refer to: *Le biografie scientifiche*, ed. by Antonello La Vergata, special issue of *Intersezioni*, 1 (1995); *Telling Lives in Science: Essays on Scientific Biography*, ed. by Michael Shortland and Richard Yeo (Cambridge: Cambridge University Press, 1996); *The History and Poetics of Scientific Biography*, ed. by Thomas Söderqvist (Aldershot: Ashgate, 2007); ‘Focus: Biography in the History of Science’, ed. by Joan L. Richards, *Isis*, 97 (2006), 302–29; ‘Scientific Biography: A Many Faced Art Form’, ed. by Oren Harman, special issue of *Journal of the History of Biology*, 44 (2011), 607–712. For further bibliography see the essays by Paula Findlen and Massimo Mazzotti in this book.

18 Statement by Lyndall Gordon from a conversation between her and Humphrey Carpenter, ‘Learning about Ourselves: Biography as Autobiography’, in *The Art of Literary Biography*, ed. by John Batchelor, 1st ed. 1995 (Oxford Scholarship online, 2011, DOI:10.1093/acprof:oso/9780198182894.003.0018).

19 Georgina Ferry, *Dorothy Hodgkin: A Life* (London: Granta Publications, 1998, and New York: Cold Spring Harbor Laboratory Press, 2000).

move toward gender equality.’ By declaring them, Abir-Am defuses those identifying processes (which apply to both men and women) that typically remain concealed, thus providing the reader with yet another means to grasp the case critically.

Of this kind of reflection – although not in relation to gender issues – historians of science have long since been aware. Already in 1970 Arnold Thackray began one of his essays by quoting the much quoted Edward H. Carr – ‘Before you study the historian study his [sic] historical and social environment’ – and replied with a quotation by Alexandre Koyré: ‘the historian projects into history the interests and the scale of values of his [sic] own time.’²⁰ And yet I haven’t found that science studies scholars have followed this up by enquiring into the side effects caused by the self of the historian, including his or her gender, nor in relation to his or her biographee’s gender. If gender issues do not remain outside the lab and play a role in the making of science and its institutions, as the literature of the last thirty years has shown,²¹ they clearly cannot be extraneous to the historian’s craft. The use of masculine pronouns in the specialist literature, as in the case of Carr and Koyré, and still today,²² probably does not just derive from consolidated conventions in modern languages. This certainly cannot be the case from the 1960s, with the diffusion of cultural studies and the so called second wave of feminism, and with the entry of women en masse into higher education and (a little less en masse) into the professions and academe. It is no coincidence that the resurgence of biography began in the 1970s, thanks to the debate on autobiography enriched with a new, radical freshness by feminists and by women’s and gender studies scholars. It was in that context of discussions on the interrelations between personal and social that biography began to be thought of as scholarly writing; it was then, after those autobiographical initiatives relating to gender, that the question of how a biography comes into being began to be asked, and how the biographer can capture the essence of a creative mind.²³

20 Arnold Thackray, ‘Science: Has its Present Past a Future?’, in *Historical and Philosophical Perspectives of Science*, ed. by Roger H. Stuewer, Minnesota Archive edition, vol. 5 (University of Minnesota, 1970), pp. 112–33 (p. 112).

21 There is by now a wealth of literature on the subject. For classic examples see ahead, notes 46 and 47, and for further bibliography see the essays by Londa Schiebinger, Paula Findlen, Massimo Mazzotti, and Prina G. Abir-Am in this book.

22 On the subject of biography, see for example Oren Harman, ‘Introduction to the Special Issue Scientific Biography: A Many Faced Art Form’, *Journal of the History of Biology*, 44 (2011), 607–9 (p. 608).

23 On this latter point, see *Reading Autobiography*, ed. by Smith and Watson, chapter 7. See also Thomas L. Hankins, ‘In Defence of Biography: The Use of Biography in the History of Science’, *History of Science*, 17 (1979), 1–16; *Musical Biography: Towards New Paradigms*, ed. by Jolanta T. Pekacz (Aldershot: Ashgate, 2006).

In 1971, while those debates had really got going, Arnaldo Momigliano (1908 – 1987) published his classic study on biography in ancient Greece. Once again confirming the connections between biography and autobiography, he began thus: ‘When I was young, scholars wrote history, and gentlemen wrote biographies.’²⁴ The elegance of the image should not make us forget that those ‘gentlemen’ were witness to ancient tensions between men and women in the profession of history, in particular in relation to biography. A scholar like Momigliano was of course aware of the contribution of numerous women biographers and historians active in Europe from the nineteenth century. Often as independent scholars, to use the expression current today, many women historians had made important and often recognized contributions, including the history of science.²⁵ This was the situation in Italy, where Momigliano had begun his academic career, and in the United Kingdom, where he moved in 1938 after the introduction of racial laws by the fascist regime. To say nothing of women biographers.²⁶ In fact in that same first page he mentioned – *in en passant* – Virginia Woolf. When Momigliano ‘was young’ it had been Woolf, of course, who had rethought biography in a new form.²⁷ Professional writer and publisher in polemical opposition to the (male) academic world,²⁸ Woolf had contributed to making an important debate on biography more widely heard. It was a genre she worked in and helped raise to a new level of quality, from the popularizing, eulogistic, and often boring instrument typical of the Victorian age, to the complex one bordering on a variety of genres that we know today. Few writers have demonstrated the profound connection that exists between narrative processes – including the biographical and historiographical – and the auto-biographical in the way Woolf did.²⁹ Yet in 1971, on writing about a genre like

24 Arnaldo Momigliano, ‘Introduction: The Ambiguous State of Biography’, in Id., *The Development of Greek Biography: Four Lectures*, expanded edition (Harvard University Press, 1993), p. 1 (1st ed. 1971).

25 Also for the bibliography on the subject, see Gianna Pomata, ‘Amateurs by Choice: Women and the Pursuit of Independent Scholarship in Twentieth-Century Historical Writing’, in *Centaurus*, 55 (2013), 1 – 24. This article deals with the cases of Hélène Metzger and Frances Yates, among others. For the biographical profile of another interesting, professionally successful woman historian of science, see Roy MacLeod, ‘Margaret Mary Gowing, 1921 – 1998’, *Biographical Memoirs of Fellows of the British Academy*, 11 (2012), 267 – 327.

26 *Gender in the Production of History*, ed. by Luisa Passerini and Polymeris Voglis (Florence: European University Institute, Working Paper HEC 99/2, 1999); ‘History Women’, ed. by Mary O’Dowd and Ilaria Porciani, special issue of *Storia della storiografia*, 46 (2004); Maria Pia Casalena, *Scritti storici di donne italiane: Bibliografia 1800 – 1945* (Florence: Olschki, 2003).

27 Elena Gualtieri, ‘The Impossible Art: Virginia Woolf on Modern Biography’, *Cambridge Quarterly*, 29 (2000), 349 – 61.

28 Virginia Woolf, *A Room of One’s Own* (London: The Hogarth Press, 1929).

29 On these subjects, the literature, extremely fascinating as it is, is almost infinite. See at least Estelle C. Jelinek, *The Tradition of Women’s Autobiography: From Antiquity to the Present*

biography, Momigliano wrote ‘gentlemen’ when referring to writers of biography, and cited Woolf just once.

In the past two decades biography has been sometimes at the centre of important debates in the history of science, and yet when faced with the role of gender in the relationship between biographer and biographee, there remains an uneasiness reminiscent of that of Momigliano.

II. The Trouble with Biography

In the last thirty years historians and sociologists of science have demonstrated that gender shapes the culture of science just as it shapes any other culture. Keller, Abir-Am and Schiebinger were among the first to address the subject, and did it with different approaches. The dialogue, if sometimes difficult, between different theoretical, sociological, and historiographical approaches to gender studies and to women’s history, in the long term has been a winner. It has led the international community of science studies scholars to a better understanding of how science works.³⁰

But if gender plays a role in what we now call the ‘impureness’ of science,³¹ it plays a role in its history, including gender history, as well.

Recently Jessica Riskin called for a ‘third way’ in the history of science and science studies, following on other interventions that have gone in the same direction in recent years.³² An ‘inclusive’ approach of the variety of views on

(Boston: Twayne, 1986). For further bibliography, see *Reading Autobiography*, ed. by Smith and Watson.

30 I restrict myself to citing the recognition coming from different parts of the community, as for example in Jan Golinski, *Making Natural Knowledge: Constructivism and the History of Science* (Chicago: Chicago University Press, 2005 [1998]), and *Companion to the History of Modern Science*, ed. by John L. Heilbron (ed. in chief), James Bartholomew, Jim Bennett, Frederic L. Holmes, Rachel Laudan, and Giuliano Pancaldi (Oxford: Oxford University Press, 2003); the *Companion* makes room for numerous entries, from ‘Gender and Science’, by Londa Schiebinger, to ‘Woman in Science’, by Pnina G. Abir-Am.

31 Steven Shapin, *Never Pure: Historical Studies of Science as if it was Produced by People with Bodies, Situated in Time, Space, Culture, and Society, and Struggling for Credibility and Authority* (Baltimore: Johns Hopkins University Press, 2010).

32 Jessica Riskin, ‘Introduction: A Mingled Yarn’, in *Nature Engaged: Science in Practice from the Renaissance to the Present*, ed. by Mario Biagioli and Jessica Riskin (Palgrave: Macmillan, 2012), pp. 1–15. Already on other occasions attention had been called to the possibilities offered by the integration of different perspectives on science and its history. See at least Jed Z. Buchwald and Sylvan S. Schweber, ‘Conclusion’, in *Scientific Practice: Theories and Stories of Doing Physics*, ed. by Jed Z. Buchwald (Chicago: University of Chicago Press, 1995), pp. 345–51; Lorraine Daston, ‘The Coming into Being of Scientific Objects’, in *Biographies of Scientific Objects*, ed. by Lorraine Daston (Chicago: Chicago University Press, 2000), pp. 1–14; Pancaldi, *Volta*, pp. 1–6.

science and its history should involve women's and gender studies on science more directly. It would seem at this point a matter of urgency to shelve the attitude of those who affirm the importance of gender in the history of science, and then take care not to use it, observing with benevolent condescension those who engage with it. While on the part of those who have gender and/or women's history in their daily toolkits, a less self-referential use of those same tools is now possible.³³ Thinking about (auto)biography may help us to build bridges between different approaches to men and women's lives in science. Biography could be the lab for trying to achieve a methodological self-awareness sustained by a 'pragmatic' autobiography, avoiding self-celebration and self-referential attitudes. Thomas Söderqvist, a historian of science who has focused a great deal on the subject of 'biography', has observed that 'Eulogies for nationalistic or professional purposes have given way to biographies written for gender or ethnic identity political reasons.'³⁴ Everyone knows that the history of science of the last two centuries is riddled with eulogistic biographies of male 'heroes' of science written by male historians of science. It must be for this that Söderqvist only gives examples of women authors of biographies of women scientists, in his opinion hagiographic.

A slightly irreverent, long-term glance over the history of science may help us understand the 'embarrassment' of historians of science over biography and autobiography in relation to gender issues. The exercise of modesty we now feel urgent after casting such a glance is useful to remind us that, up until not many decades ago, scientists recognized themselves as part of a supra-national community (typically of men), which for centuries presented itself as the only one able to produce 'objective' knowledge. On their part, historians, sociologists, and philosophers of science, sharing with scientists the cult of science as a 'special' endeavor, denied that 'feelings' and 'society' had a role to play in the practice of science and the making of knowledge.

From the 1970s, new generations of historians and science studies scholars have opened up new perspectives. The process has led to practical institutional outcomes: from the precarious status enjoyed by history of science at the time of the 'founding father' (George Sarton, it will be remembered, managed to obtain tenure after a struggle when he was fifty-six years old),³⁵ historians of science

33 On the other hand, on the complexity taken on by the concept of gender, so that by now we hear of 'indeterminacy', see Joan W. Scott, 'The Uses and Abuses of Gender', *Lectio Magistralis*, VI Congress of the Società Italiana delle Storiche (University of Padua, February 14, 2013), as far as I know only published in Italian in Joan W. Scott, *Genere, politica, storia*, ed. by Ida Fazio (Rome: Viella, 2013), pp. 105–127.

34 Söderqvist, 'The Seven Sisters', p. 643.

35 Lewis Pyenson, 'George Sarton, Biography', at <http://www.sartonchair.ugent.be/en/sarton/>

have spread and multiplied in the departments of science, history, sociology, and philosophy worldwide. At the scientific level, they have managed to emerge as interlocutors of colleagues in many research fields, including policy makers and economists.³⁶ The dialogue with scientists themselves, though, has known many ups and downs. Acting occasionally as enterprising descendants of high priests of science like Thomas H. Huxley (1825–1895), personalities quite extraordinary for their charisma and social engagement,³⁷ many reformer historians and sociologists of science from the 1970s committed themselves to the undertaking of explaining to scientists themselves what science really is and how it functions. The enterprise gave rise to the well-known ‘science wars’, and at the same time to a ‘civil war’ among the reformers themselves. As with every conflict that deserves the name, the so-called science wars have wreaked havoc, but also created heroes, heroines, and myths, on which the literature is plentiful.³⁸ The generation which conducted the wars seems now affected by a healthy syndrome of the repose of the warrior. The ‘commemorative celebrations’ of the fiftieth anniversary of the publication of *The Structure of Scientific Revolutions* by Thomas Kuhn (1962),³⁹ the ‘founding father’ of a second wave of the history of science, took place in 2012 in this post-war context. *Structure*, the only book of the history of science ‘that everyone in our field has read’, no doubt deserved the celebrations.⁴⁰ There is a certain relationship between the degree of maturity

biography, and Id., *The Passion of George Sarton: A Modern Marriage and Its Discipline* (Philadelphia: American Philosophical Society, 2007).

- 36 For example, when the economists got involved in biography and autobiography, they cited, as a positive example to be followed, for the historians of science, Mary Terrall and her ‘Biography as Cultural History of Science’, *Isis*, 97 (2006), 306–13. See E. Roy Weintraub and Evelyn L. Forget, ‘Introduction’, in *Economists’ Lives*, ed. by E. Roy Weintraub and Evelyn L. Forget, p. 2.
- 37 Adrian Desmond, *Huxley: From Devil’s Discipline to Evolution’s High Priest* (Reading: Addison-Wesley, 1997).
- 38 But I shall be referring here, also for further bibliographical references, only to: Mario Biagioli, ‘Introduction’, in *The Science Studies Reader*, ed. by Mario Biagioli (New York: Routledge, 1998), pp. xi–xvi; Bruno Latour, ‘The Invention of the Science Wars: The Settlement of Socrates and Callicles’, in Bruno Latour, *Pandora’s Hope: Essays on the Reality of Science Studies* (Cambridge: Harvard University Press 1999), pp. 216–35; *Beyond the Science Wars: The Missing Discourse about Science and Society*, ed. by Ullica Segerstråle (Albany: State University of New York, 2000).
- 39 There were a great number of interesting meetings, from which we await publications. Among others: at the Center for Philosophy and History of Science of the Boston University, 50 years since Kuhn’s *Structure of Scientific Revolutions* (March 23, 2012), and at the Max Planck Institute for the History of Science, Berlin, Towards a History of the History of Science: 50 years since *Structure* (October 17–20, 2012).
- 40 Michael D. Gordin and Erika Lorraine Milam, ‘A Repository for More than Anecdote: Fifty Years of *The Structure of Scientific Revolutions*’, *Historical Studies in the Natural Sciences*, 42 (2012), 276–78 (p. 476). Historians of science have explored the relations between commemorations and the history of science. See ‘Commemorative Practices in Science. Hi-

(institutional and scientific) of a professional group engaged in commemorating a founding ‘father’, and the autobiographical ‘needs’ of its members. So the anniversary of the publication of *Structure* was also the occasion for the publication of many, brief autobiographical interventions, actually very interesting.⁴¹ They were sober incursions into autobiography,⁴² allowing some intriguing comparisons with similar pieces produced from the 1970s by generations of women scholars, both humanists and scientists.⁴³ A first comparison to emerge, for example, stems from the fact that when women scholars have to face up to their own path of intellectual and professional development, they do not hesitate to go into ‘embarrassing’ questions, at the same time personal and social, like the questions of gender. On the other side, as far as I know, no male science studies scholar has carried out an analysis of what it means to be a male scholar embedded in a society where the language of wars and revolutions, heroes, conquerors, warriors and veterans, controversies and races is the language to which he has been exposed from birth, and like him, before him, his ‘founding fathers’, whether biological or intellectual.

In 1983 the reactions to Keller’s biography of McClintock were in the first place a reaction to the use of a term – feeling –, already in the title, and which struck an exposed nerve in relation to those subjects, as Keller recalls in her essay below.⁴⁴ To many readers, ‘feeling’ evoked a personal and therefore not professional dimension, irrelevant to science. Again in line with that tradition, in the readers who had known McClintock, ‘feeling’ evoked ‘female’ characteristics per

historical Perspectives on the Politics of Collective Memory’, ed. by Pnina G. Abir-Am and Clark A. Elliott, *Osiris*, 14 (1999).

- 41 See the interventions in the special issue of *Historical Studies in the Natural Sciences*, 42/5 (2012). From some of these autobiographical reflections we learn that from the 1970s to the 1980s *Structure* fascinated students more than any other book, to the extent that some were persuaded to abandon what they were doing in favour of history of science, the discipline they decided to cultivate professionally. Mario Biagioli, ‘Productive Illusions: Kuhn’s *Structure* as a Recruitment Tool’, *Historical Studies in the Natural Sciences*, 42 (2012), 479 – 84 (p. 480); Bruce V. Lewenstein, ‘Finding Kuhn, Finding Myself’, *Historical Studies in the Natural Sciences*, 42 (2012), pp. 538 – 41. Besides, see Abir-Am’s recollections in her essay in this book.
- 42 Interesting are the autobiographical pages in Bruno Latour, *We Have Never been Modern*, trans. by Catherine Porter (Cambridge, MA: Harvard University Press, 1993), pp. 165 – 66. According to Steven Shapin: ‘This special sort of scholarship [history and sociology of science] will be, as it always has been, an act of self-understanding’ (Acknowledgement by Steven Shapin, 2005 Erasmus Price to Simon Schaffer and Steven Shapin), see at <http://www.erasmusprijs.org/index.cfm?lang=en&page=2005:+SIMON+SCHAFFER,+STEVEN+SHAPIN>.
- 43 For a study of the various approaches to autobiography by women and men, see Estelle C. Jelinek, ‘Introduction: Women’s Autobiography and the Male Tradition’, in *Women’s Autobiography: Essays in Criticism*, ed. by Estelle C. Jelinek (Bloomington: Indiana University Press, 1980), pp. 21 – 38.
- 44 Evelyn Fox Keller, *A Feeling for the Organism: The Life and Work of Barbara McClintock* (San Francisco: W. H. Freeman and Company, 1983).

se extraneous to the geneticist's tasks. In many feminists, on the other hand, 'feeling' evoked that 'different' dimension of science which, according to some, women should take with them into the laboratory. Not one of these was the case with McClintock. In her essay below, Keller recalls, the 'spirit of McClintock's own vision (and mine)' is that of a "gender-free' science.' Thirty years on from the publication of *A Feeling for the Organism: The Life and Work of Barbara McClintock*, a book that has become a classic internationally, the present volume renews that challenge for science studies scholars, including feminist scholars: the goal of a gender-free history of science, we believe, is still worth pursuing.

III. Featuring Diversity

In 1999 at the University of Cambridge a group of women historians, scientists, sociologists, and science writers from fifteen countries gathered to discuss 'Women in the History of Science: Biography, Autobiography, Tasks, Results, Problems – with Critical Discussion of the (Auto)Biographical Method.'⁴⁵ The main aim among the numerous scholars was to extend the audience of experts as well as non-experts of the history of women in science. Biography seemed to be the most suitable instrument for this purpose. What has happened since then?

Quantitative data can help us understand what has happened in the field over the last fifteen years, compared with the two previous decades. If in the history of science, technology, and medicine database (now available from EBSCO) you search the phrase 'women and biography', the system responds with twenty-two titles published in the period 1979–1989 (books, articles in journals, and chapters in books). Among the titles of that pioneering decade you find of course milestones such as Keller's already mentioned *A Feeling for the Organism*, *Uneasy Careers*, co-edited by Abir-Am, and Schiebinger's *The Mind Has No Sex?*⁴⁶ The lively international debates which followed the publication of those books, and a few others,⁴⁷ fostered a wealth of biographical research on women's lives in

45 The meeting was organized by the late Joan Mason for the Women's Commission of the Division of the History of Science of the International Union of the History and Philosophy of Science (Newnham College, Cambridge, UK, September 10–12, 1999). On the meeting, which unfortunately failed to result in the production of a book, see Paola Govoni, 'Biography. A Critical Tool to Bridge the History of Science and the History of Women in Science', *Nuncius*, 1 (2000), 399–409.

46 *Uneasy Careers and Intimate Lives: Women in Science, 1789–1979*, ed. by Prina G. Abir-Am and Dorinda Outram (New Brunswick: Rutgers University Press, 1987); Londa Schiebinger, *The Mind Has No Sex? Women in the Origin of Modern Science* (Cambridge, MA: Harvard University Press, 1989).

47 Among others, see Margaret W. Rossiter, *Women Scientists in America: Struggles and Strategies to 1940* (Baltimore: Johns Hopkins University Press, 1982); Marilyn Bailey Ogilvie,

natural philosophy and science. In fact, the search in the EBSCO database for the period 1990 – 1995 gives 100 entries, followed by 174 in the period 1996 – 2001. Yet the period 2002 – 2007 gives eighty-four entries, and 2008 – 2013 only forty-five (December 9, 2013).

This decrease does not depend on a lack of new cases, as the essays by Findlen and by Govoni demonstrate below: from the archives, the forgotten voices of interesting women scholars emerge continuously, both those belonging to the remote past of the Republic of Letters and those of the twentieth century. The decrease in the production of biographies of woman scientists probably indicates a new phase in studies on gender and science, but there is perhaps another factor to take into account.

In newspapers, on the internet, or in bookshops, much more can be found on women and science nowadays than in the past. You hardly need to be reminded that, in 1995, journalist Dava Sobel's *Longitude* caused an earthquake in the history of science community.⁴⁸ Science writers like Sobel succeeded in exploiting the most fascinating episodes of the history of science, writing books that sometimes ranked top in the best-sellers' list. Several of those books were on women in science, such as Ferry's biography of Hodgkin, Franklin's by Brenda Maddox,⁴⁹ or Susan Quinn's and Barbara Goldsmith's books on Marie Curie, which Fortunati examines in her essay below. Historians of science, perturbed and at the same time challenged by the phenomenon, opened up a channel of communication with professional science writers.⁵⁰ Since that dialogue – useful to keep under control the tendency of the sector, mentioned earlier, towards a 'complex of superiority' – it has been possible to do a lot to improve communications with scientists and the public, above all with younger readers and

Women in Science. Antiquity Through the Nineteenth Century. A Biographical Dictionary with Annotated Bibliography (Cambridge, MA: MIT Press, 1986); Ludmilla Jordanova, *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries* (Madison: University of Wisconsin Press, 1989); Margaret W. Rossiter, *Women Scientists in America: Before Affirmative Action, 1940–1972* (Baltimore: Johns Hopkins University Press, 1995); *Creative Couples in the Sciences*, ed. by Helena M. Pycior, Nancy G. Slack, Pnina G. Abir-Am (New Brunswick: Rutgers University Press, 1996).

48 Dava Sobel, *Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time* (New York: Walker & Company, 1995).

49 Brenda Maddox, *Rosalind Franklin: The Dark Lady of DNA* (London: HarperCollins, 2002).

50 David P. Miller, 'The 'Sobel effect': The Amazing Tale of How Multitudes of Popular Writers Pinched all the Best Stories in the History of Science and Became Rich and Famous while Historians Languished in Accustomed Poverty and Obscurity, and how this Transformed the World. A Reflection on a Publishing Phenomenon', *Metascience*, 2 (2002), 185 – 200; Paola Govoni, 'Historians of Science and the 'Sobel Effect'', *Journal of Science Communication*, 4 (2005), 1 – 17; Peter Bowler, 'Presidential Address. Experts and Publishers: Writing Popular Science in early Twentieth-Century Britain, Writing Popular History of Science Now', *British Journal of the History of Science*, 39 (2006), 159 – 87; John Gascoigne, 'Getting a Fix': The Longitude Phenomenon', *Isis*, 98 (2007), 769 – 78.

students. Some historians of science, without giving up any of the tools of their profession, have taken the challenge seriously. Already in 1991 Adrian Desmond and James Moore, with *Darwin*,⁵¹ had written a biography which is by now a classic of the sector, as well as a much translated best seller.⁵² Desmond and Moore were able to write in that ‘natural language’ which makes a book like theirs, certainly academic, at the same time capable of communicating with non-scholarly readers; and note that one of the strong points of the book was the dialogue between men and women. The ability to use that ‘natural language’ comes more easily when historians succeed in opening up to ‘diversity’, both within historiography and interpretation, and with colleagues from other fields.

It was Woolf who showed that once a tradition of women’s writing had been created, professional women writers were at last able to create a language capable of recounting lives: both women *and* men’s lives. In her opinion this objective could be achieved through literature, not history. Woolf gave the example of Jane Austen,⁵³ the writer who, going against a tradition that for so long had ignored the role of women, was the first to produce that ‘natural language’ that had given her characters, both men and women, a credibility that would resist for two centuries.

IV. Back to (Auto)Biography

This book divides into three parts. In the first and second part the order is chronological with reference to the publications of the authors; in the third part the chronology is that of the biographees. Some of the principal points emerging in the book are picked up and analyzed from an anthropological perspective in the concluding remarks of Zelda A. Franceschi.

The essays in the first part – ‘Between Biography and Autobiography’ – offer a comparison of the professional experience of three writers who have been able to circulate their research on lives in science among a broad public. Evelyn Fox Keller has succeeded in developing a dialogue with colleagues in a variety of disciplines, in the sciences as well as in the humanities, and with an international

51 Adrian Desmond and James Moore, *Darwin* (New York: Warner Books, 1991).

52 In 1995 Moore noted that most of the scientific biographies had been written by scholars for scholars: James Moore, ‘Scrivere la biografia di Darwin’, in *Le biografie scientifiche*, ed. by La Vergata, p. 131. Moore’s intervention is followed by Giuliano Pancaldi, *Osservazioni critiche*, *ibid.*, pp. 136–38, and by James Moore and Adrian Desmond, *Risposta a Pancaldi*, *ibid.*, pp. 138–39. Also in other disciplines it would seem that at the end of the 1980s biography was usually practiced by people outside academia. See Eric Homberger and John Charmley, ‘Introduction’, in *The Troubled Face of Biography*, ed. by Eric Homberger and John Charmley (London: Macmillan Press, 1988), pp. ix–xv (p. ix).

53 Woolf, *A Room of One’s Own*.

lay public. Londa Schiebinger has made a significant contribution to bringing women's and gender studies to a central place in the interests of the community of scholars and students in the history of science and their institutions, in addition to politics tout court. Georgina Ferry, with her work as biographer, writer for the theater, science journalist, and broadcaster, has succeeded in reaching both scientists and an extensive lay public.

Keller reconstructs the reasons that led her to write the biography of geneticist Barbara McClintock (1902–1992), published in 1983. She describes the reactions of feminists, scientists, and publishers when the book came out, and how these changed, only a few months later, with the awarding of the Nobel Prize to McClintock. The biographical project concerning McClintock revolved around the concept of human – not women's – creativity in science, and the book was on women's rights in science, not on gender and science; but these issues were often not understood by academic readers. In response, Keller wrote a good many articles and letters trying to explain the difference between sex and gender, and trying to explain how ideology can have a hold on us and yet not be absolutely binding. But as often happens with important books, Keller's book appealed to various kinds of reader who appropriated it to themselves, often twisting, stretching or misinterpreting the intentions of the author: a phenomenon well known to historians of science working on the circulation of knowledge.⁵⁴ As a matter of fact, it was precisely that dialogue – often antagonistic – between Keller and some of her readers, that nourished a debate encouraging new studies on women, gender, and science. In her essay here Keller, once again, makes her own position clear, and adds something important on the relations between biographer and biographee. She writes: "Informants' memories are themselves influenced by their needs, and inevitably so, for, just as we constantly rewrite the stories we read, so too, we constantly rewrite our memories." This is especially the case with the dialogue Keller revives here with Nathaniel C. Comfort, the author of another important book on McClintock.⁵⁵ In Comfort's opinion Keller was the one who 'created' the 'myth' of McClintock and, in particular, the myth of a McClintock 'isolated' by the community of geneticists. Comfort's work is based on correspondence and lab notebooks to which Keller had not had access, and enriches the image of the geneticist with new, important features. Writing on McClintock, Comfort did not suffer from – and nor did he take advantage of – the relationship that is established between biographer and biographee, as on the other hand had happened in Keller's case, basing her book mainly on a first

54 *Global Spencerism: The Appropriation of Herbert Spencer*, ed. by Bernard V. Lightman (Leiden and Boston: Brill, forthcoming).

55 Nathaniel C. Comfort, *The Tangled Field: Barbara McClintock's Search for the Patterns of Genetic Control* (Cambridge, MA: Harvard University Press, 2001).

person dialogue with the scientist. For the reader, the cases of Keller and Comfort make for an interesting comparison in (auto)biography, and the relations between biographer and biographee in connection with gender. Keller recalls here that her biography ‘was narrated (and recorded) at a particular moment in time.’ We would seem to be justified in asking ourselves whether the (not positive) experiences with the men scientists with whom Keller interacted, first as a Harvard PhD student and later as a scientist, played a role in placing her in harmony with McClintock, who had also gone through not easy experiences; a harmony which led them, together, to work out and develop the concept of science as ‘a place where gender could disappear.’⁵⁶ Comfort made clear his own awareness of the risks of ‘applying modern understanding to history.’⁵⁷ Also in his case we may ask ourselves how far, when Comfort was writing on McClintock, he was influenced by a family situation in which a scientist like Carol W. Greider, at that time his wife,⁵⁸ was in action together with her team of colleagues, among whom Blackburn. As Abir-Am relates in her essay, Greider in 2009 would share with Blackburn the Nobel Prize in medicine or physiology: the high point of a career that had been successful from the start, a career shared with Blackburn, and on the part of both with a profound awareness of gender issues.⁵⁹ These women microbiologists were able – both for their personal qualities and for the opportunities offered by the context – to work in their lab ‘as if’ science was ‘a place where gender could disappear.’

Londa Schiebinger in her essay interweaves her own professional experience with the subjects at the center of her research.⁶⁰ For Schiebinger historians should be ‘public intellectuals’, looking beyond their contribution to historical scholarship. This conviction of hers is reflected in her intellectual production from the time when, as a graduate student, she chose to work on women’s and gender studies, in the 1980s an ‘unknown area’, which seemed the least suitable

56 The autobiographical pages of Keller on her experience at Harvard at the end of the 1950s should be read, when ‘arrogance’ was held by male students of physics to be a founding aspect of professionalism. See Keller, ‘The Anomaly of a Woman in Physics.’ Besides, see Elisabetta Donini, *Conversazioni con Evelyn Fox Keller, una scienziata anomala* (Milan: elèuthera, 1991).

57 Comfort, *The Tangled Field*, p. 271. In addition see Comfort, ‘When Your Sources Talk Back’, where the author brings in questions of sensory physiology, which also play a role when you work on the life and work of a living scientist.

58 Information deduced from the dedication to Comfort’s book. For further reference see the essay by Abir-Am in this book.

59 On the nearly thirty years of collaboration between Blackburn and Greider see, American Association for Cancer Research, Interview with Elizabeth H. Blackburn, PhD, and Carol Greider, PhD, see at <http://www.youtube.com/watch?v=C9CkzZm-e2I>

60 Schiebinger’s research made significant room for the lives of men and women in natural philosophy since the by now classic: Londa Schiebinger, ‘Maria Winkelmann at the Berlin Academy: A Turning Point for Women in Science’, *Isis*, 78 (1987), 174–200.

sector to cultivate for a successful career in a prestigious American university. The 'gamble' on a research area so challenging from a scientific point of view, and with such politically loaded implications, characterized her historiographical production, her career, and her closest relationships. She recounts here how her personal convictions were transformed or reified over time in institutional activities, both academic and political. To the projects for which she provided the inspiration while she served as Director of the Michelle R. Clayman Institute for Gender Research at Stanford, Schiebinger brought her skills and experience as a historian, public intellectual, and one half of a collaborative academic couple. Those experiences have played a role in Schiebinger's way of writing about men and women natural scientists' lives. What she offers here is the self portrait of a determined woman, who presents her own life with a political agenda in mind: a model to offer younger women in science, and a reminder that in academe women are still strongly discriminated against. To reach a broader public, especially the young, was one of her goals. In her opinion 'gender scholars often write in the high and sometimes jargon-ridden language required for advancement within their own profession.' Avoiding the jargon helps to get beyond discipline boundaries, and extend our knowledge, while at the same time it enables us to reach a wider public. Avoiding the jargon also means trying to go beyond ideologies, including feminist ideologies.

The biographies of two crystallographers and Nobel prizewinners, Dorothy Hodgkin (1910–1994) and Max Perutz (1914–2002), offer an occasion for a comparison of different ways of recounting lives by those who, like Georgina Ferry, deal with scientists, policy makers, and the lay public. In 1994 Ferry wrote her biography of Hodgkin, the only woman scientist to win the Nobel Prize for the United Kingdom, from a 'simple desire', as she writes here: to get Hodgkin's name better known among her own compatriots. Ferry says here that when she began to write about Hodgkin she was unaware that biography was barely acknowledged as a genre by historians of science. It seemed 'natural' to her, to explore not only Hodgkin's scientific career but also how she had achieved scientific success while shouldering family and household responsibilities. Access to Hodgkin's papers and interviews with friends and colleagues allowed her to place Hodgkin's life in context: as well as being a top level scientist, with children and the family to attend to, Hodgkin had to cope with a physical frailty that did not prevent her from devoting herself to her passionate commitment to socialism, East-West relations, and world peace. Ferry took a similar multifaceted approach to the life of Max Perutz, another Nobel-prizewinning crystallographer whose story included the experience of emigration from Nazi-occupied Europe and the redevelopment of his identity as a British subject. It was Perutz himself who contacted Ferry for his biography, and she tells here of her initial hesitations, also because of the gender of her new biographee. To judge

from the number of times she was cited, and from the invitations she received to bring her experience as a biographer to specialist conferences, historians of science took seriously Ferry's approach to writing about men and women's lives in science. Professional writers, like Ferry, and professional historians, often research in the same areas and make use of the same sources; what differentiates them, obviously, are narrative strategies. If we need 'new narrative strategies' to explore what Barry Barnes calls 'the fine line between [social] status and [internal] state', as Mazzotti reminds us in his paper, the dialogue between science studies scholars and professional writers like Ferry should not be underestimated. It would seem especially important if we wish to reach scientists and the public with an image of science somewhat less jaded, sweetened, or hero/heroine worshipping than the one often to be found in popularizing literature.

The second part of this book – 'Shaping Biographies' – focuses on methodological and historiographical aspects based on specific historical cases related to the Enlightenment. Marta Cavazza, Paula Findlen, and Massimo Mazzotti are recognized experts on the Enlightenment, belonging to different generations. Their objectives are also different when they 'use' the lives and work of eighteenth-century Italian women natural philosophers who in some cases are well-known and even of legendary status, in others are brought to light after over two centuries of oblivion. The works of Cavazza, Findlen, and Mazzotti have made use of the biographical genre, as it were, to go beyond it.

The life of Laura Bassi, the first woman university teacher in the Western world, was told many times both while she was alive, and in the nineteenth and twentieth centuries. In 2011, on the occasion of the three hundredth anniversary of her birth, there were a number of publications and initiatives commemorating her. Bassi's image in her biographies has changed significantly, both for the variety of sources and the cultural and social transformations of Italian and European society over the last two centuries. To Cavazza, the case of Bassi offers evidence of the ideological construct intrinsic to biography as a literary genre. Although Cavazza has found at least seventy biographical texts on the *dottoressa*, to her the Bolognese natural philosopher remains a figure in some ways inaccessible to us. The wealth of documentation in fact concerns eighteenth century biographies and portraits and correspondence, besides Bassi's scientific writings and an abundance of archive material on her public life. Yet, apart from some rare autobiographical hints in her letters and official speeches, sources capable of telling us something about her inner life are very few indeed. Through a comparative study of contemporary and posthumous biographical texts about Bassi, Cavazza proposes to add some new features to the *dottoressa* image, bringing out diverse, changing gender models. It is a fascinating journey through sources that, for those who will engage with them in the future, will be the basis for a 'metabiography' of Bassi.

Biography is also considered by Paula Findlen to be one of the most powerful genres in the construction of the public image of scientists, allowing us to follow the changes of gender stereotypes from the eighteenth century to the present. But this was not always the case: Findlen relates here that when she first approached Laura Bassi⁶¹ she told herself that her goal was *not* to write a biography. Findlen admits that in the past her own image of biography ‘reflected many of the prejudices of social and cultural historians who considered this genre too heroic, too isolating and idolizing of the individual.’ In the course of time her opinion of biography altered, thanks to her work on so many men and women’s lives in natural philosophy in the last twenty years, and with the historiographical debate on biography enriched by many important interventions. In her essay Findlen goes over the route she took researching on women natural philosophers, experimenters, and mathematicians in eighteenth-century Italy, leading her ‘to reconsider the value of biography.’ The paper is also an opportunity to reflect on sources. To Findlen it is a commonplace to describe the history of women scientists as an act of rediscovery and recuperation. Findlen’s essay asks us to reflect on the importance of late nineteenth and early twentieth-century biographies and encyclopedias, often ignored because not ‘scholarly’ enough or, in the case of Italian fascist publications, politically suspect.⁶² Taking seriously sources often ignored enabled her to recover the voices of several scholars fallen into oblivion. Among the subjects Findlen discusses there is that of ‘invisibility’, so crucial when one works on women scholars’ lives: they were often not invisible in their own time but have become so afterwards, through a ‘process of selection.’ Both the ‘silence’ created around some people rather than others, and the historical process of ‘selection’, are central to Findlen who recently decided to write a *biography* of Laura Bassi.

In the case of mathematician Maria Gaetana Agnesi (1718 – 1799), biography is presented by Massimo Mazzotti as offering access to, and new vistas on, a complex phenomenon like the relationship between science and the Catholic faith in the Enlightenment. To Mazzotti, there is still a good deal of ambiguity towards biography as a genre in recent historiography, which can be related primarily to a perceived dichotomy between on the one hand individuals, and on the other the micro and macro settings with which they interact. For Mazzotti, social theory offers the tools to tackle the classic problem of the relationship between action and structure, and he describes the way in which he himself engaged with these questions in his biography of Agnesi. He believes biography

61 Paula Findlen, ‘Science as a Career in Enlightenment Italy: The Strategies of Laura Bassi’, *Isis*, 84 (1993), 441 – 69.

62 On the use of sources, up until the most recent developments, see Paula Findlen, ‘How Google Rediscovered the 19th Century’, *The Chronicle of Higher Education*, July 22, 2013, at <http://chronicle.com/blogs/conversation/2013/07/22/how-google-rediscovered-the-19th-century/>.

allows us to address both the story of a life, and the theoretical processes that help us understand how cognitive and social structures are constructed and modified. His discussion on how scientific biography has been used is the basis from which he deals with his own case. Biographical narration can be a suitable instrument to explore the moral economy of science, especially when people considered ‘marginal’ like women are chosen. Biography can thus reveal the connections between moral and scientific life, offering new perspectives on little explored issues. Proceeding along these lines and ‘biographing’ Agnesi, Mazzotti shows how biography can be included among the instruments of social studies. His essay on the other hand seems to challenge the category of gender. ‘Gender’ is never mentioned in his biography of Agnesi, whereas here he recognizes its presence in his toolkit, using gender to successfully overcome it.

The third part of the volume – ‘Networking’ – is ordered chronologically, from the case of Marie Curie to that of the Blackburn-Greider team, and dealt with from three different academic perspectives: literary criticism, by Vita Fortunati, anthropology, by Zeldia A. Franceschi, and the history of science by Paola Govoni and Pnina G. Abir-Am.

Vita Fortunati is an expert in nineteenth and twentieth century literature and gender studies. Convinced of the need for a more frequent dialogue between experts in different fields, she has been the inspiration and organizer, with Claudio Franceschi, an immunologist, of a challenging European project, ACUME2 – ‘Interfacing Sciences, Literature, and Humanities.’⁶³ In her paper she concentrates on one of the best known lives in science between the late nineteenth and early twentieth centuries, that of Marie Curie (1867–1934). She focuses here on the contradictory aspects of Marie Curie’s personality, lurking beneath her public image, still today presented as a coherent, strong and at the same time reassuring ‘female’ image. But behind these appearances, which Curie herself construed to sustain her research projects, there was a different life, tortured by latent depression, which Fortunati evokes here using as sources Curie’s diary and correspondence. Of the wealth of secondary literature on Curie, Fortunati decides to focus on examples belonging to a variety of narrative genres, to demonstrate how even a literature traditionally considered not ‘academic’, such as fiction, may help to unveil the complexity of a life to a vast public.

63 The project is producing the nine volumes of the series *Interfacing Science, Literature, and the Humanities*, directed by Elena Agazzi and Vita Fortunati, of which this volume is one. On the collaboration of historians of science, see *Representing Light across Arts and Sciences: Theories and Practices*, ed. by Elena Agazzi, Enrico Giannetto, and Franco Giudice (2010), and *The Case and the Canon: Anomalies, Discontinuities, Metaphors between Science and Literature*, ed. by Alessandra Calanchi, Gastone Castellani, Gabriella Morisco, and Giorgio Turchetti (2011). For the other titles, see at http://www.v-r.de/de/seriesdetail-16-16/interfacing_science_literature_and_the_humanities-3069/

The texts she analyzes and compares are two biographies by acclaimed professional writers, Susan Quinn and Barbara Goldsmith, and the biographical novel by Per Olov Enquist. The different images of Curie which emerge, on the one hand, from her autobiography and correspondence, and on the other, from the texts of Quinn, Goldsmith, and Enquist, enable Fortunati to raise issues that are of interest also to historians of science. Fortunati's paper provides alternative routes to get behind the façade that Curie herself presented: the scientist entirely devoted to her research work, the perfect mother of two daughters, the heroine who fought against the prejudices of colleagues and French and international public opinion during the Curie-Langevin case.

In her paper, Zelda A. Franceschi applies an anthropological approach to the lives of Ruth Fulton Benedict (1887–1948) and Margaret Mead (1901–1978). Pupils of Franz Uri Boas (1858–1942), Benedict and Mead are considered leading figures of so-called configurationalism, a branch of anthropology operating on the borders between cultural anthropology and psychology. Franceschi puts forward a re-reading of Mead's writings, her correspondence while involved in fieldwork, her autobiographical and biographical writings, and the correspondence between Benedict and Edward Sapir (1884–1939). The essay shows the several objectives Mead pursued through biography and autobiography. In the first place, Mead used them as fieldwork tools. Biography and autobiography, however, were later useful to present her 'own' history of anthropology in the twentieth century, as well as for popularizing anthropology for a broader public. Franceschi's paper shows that among Mead's aims, she wished to provide a new image of the woman anthropologist through the picture of herself and Benedict, an image of a woman scholar autonomous at the scientific level, and successful professionally. Something similar had been done in the Victorian age by generations of men of science and technologists, working to create a public image of a new social protagonist, the 'scientist' and/or the 'expert'.⁶⁴ Franceschi tells us how her own interest in biography and autobiography began with her interest in the history of anthropology. Early on, however, she realized that biography and autobiography also offered opportunities for the building of knowledge, especially about the 'truthfulness' of ethnographic reports, a subject of great interest also for science studies scholars.

The paper by Paola Govoni is about women who disappeared behind the shadow of a famous man, Italo Calvino (1923–1985), the internationally celebrated author in whose writings technoscience is often to the fore. The women in question are Calvino's mother, professional botanist Eva Mameli Calvino (1886–1978), her sister in law, professional chemist Anne Mannessier Mameli (1879–

64 See, among others, Christine MacLeod, *Heroes of Invention: Technology, Liberalism and British Identity, 1750–1914* (Cambridge: Cambridge University Press, 2007).

1944), and her friends, painter and naturalist Beatrice Duval (1880 – 1973), and writer Olga Resnevic Signorelli (1883 – 1973). Calvino, in the interviews he conceded about his younger years and in several autobiographical writings, never mentioned the considerable role played by those women in his own formation. A role that the archives of those women nevertheless (in particular some of his unpublished letters to Resnevic), testify to being decidedly significant. The aim of the paper is, however, only partly to give back a voice to those women scholars. Their lives and works, together with those of agronomist Mario Calvino (1875 – 1951) and chemist Efisio Mamei (1875 – 1957), Italo's father and uncle, are useful in Govoni's view to reconstruct a family and a professional network that together molded the 'two cultures lab' where Calvino grew up. By exploring the difficult relationships between Italo Calvino and that little group of men and women in science, art, and the humanities, a better understanding emerges of the myth of the so-called two cultures which Calvino himself, narrator of technoscience, helped to consolidate via his own public image. An archive-based approach is adopted to reconstruct a context which was clearly very different from the one Calvino wished to remember, and which was given mythical status in an extraordinary number of subsequent writings on Calvino.

Finally, Pnina G. Abir-Am's essay offers readers an example of an in-depth exploration of the relationships between biographer and biographee. Abir-Am examines how the process of her historical writing on women scientists changed in response to her encounter with a book by Ellen Daniell, a 1973 PhD in science, *Every Other Thursday: Stories and Strategies from Successful Women Scientists*. From an initial interest in clarifying the collaboration between Elizabeth Blackburn and Carol W. Greider, a milestone in the history of women in science, Abir-Am shifted to an exploration of these careers as symbols of the generation of women scientists that came of professional age shortly after the equal opportunity legislation of 1972. On that generation of professionals Abir-Am writes:

I found ego-histoire to be irresistible in the context of this essay, because there is more to gain from treating the process of doing historical work as a historical subject in its own right than from pretending that an imaginary distance, associated with greater objectivity in the positivist paradigm, separates me and my three subjects. Being members of the generation which first confronted the gender revolution of the 1970s may turn out to be more important than the professional divisions between the three scientists, or between them and me as a historian of science.

In Abir-Am's hands, personal and professional experiences become data of historical interest. Her study does not follow the work of scientists inside the lab, but does provide an ethno-anthropological examination in observing the lives she is working on, including a sort of auto-ethnicity. In her paper, the personal

and professional choices of women scientists interrelate also with those of the institutions where they worked or work now; choices projected against the background of the changes in the academic world of research from the 1970s to today. Abir-Am states that her paper in this book ‘is a chapter in a future study of the lost generation of women scientists of the 1970s, [and] focuses on a member of that generation whose experience can be seen as a symbol of the wider phenomenon of gender bias in science.’ Rather than a ‘lost generation’, I would suggest that Daniell and Abir-Am represent a ‘bridge generation’.⁶⁵ a generation of women scholars who have achieved important professional and cultural results in an otherwise uncertain institutional context. This emerges clearly also from the comparison Abir-Am makes between the circumstances concerning Daniell and those concerning Blackburn and Greider, a comparison useful for a better understanding of the debate on the under-representation of women in science. In Abir-Am’s view, women scientists often failed to recognize the importance of the support of feminist groups and other scholars committed to the battle against discrimination against women in the universities and the labs. Daniell’s story, Abir-Am notes here, ‘revolved around the shattering revelation for her late in 1981 that science, which she believed to be fair and objective, continued to treat men and women differently.’ The ideal of McClintock and Keller of science as a place where gender could disappear returns here in a different guise. Far from being broken by their professional experiences, Daniell and Abir-Am’s commitment testify that that remains an important ideal to aim for, in science as well as in its history.

When a project like this comes to an end one is tempted to conclude that writing about a life is as difficult as living a life. Mark Twain, who was certainly not lacking in narrative resources, wrote that ‘Biographies are but the clothes and buttons of the man [sic] – the biography of the man himself [sic] cannot be written.’⁶⁶ Even when we seem to be in control of all the tools – historical and

65 For a history of the decades lived through by Abir-Am and Daniell, see the third of a trilogy of great books: Margaret W. Rossiter, *Women Scientists in America: Forging a New World Since 1972* (Baltimore: Johns Hopkins University Press, 2012).

66 *Autobiography of Mark Twain: The Complete and Authoritative Edition*, ed. by Harriet Elionor Smith and other editors of the Mark Twain Project, The Complete and Authoritative edition, vol. 1 (Berkeley: University of California Press, 2010), p. 221. The subject of many or few ‘details’ is one of many debated by experts in life writing. For historian of science and biographer John Heilbron, in writing about interesting lives, ‘less is more’, and ‘The biographer does not have to waste time [...] in justifying and explaining his or her enterprise.’ John Heilbron, ‘Remarks on the Writing of Biography’, ‘The Life and Work of Linus Pauling (1901 – 1994): A Discourse on the Art of Biography’ (February 28–March 2, 1995), video and transcript at <http://osulibrary.oregonstate.edu/specialcollections/events/1995paulingconference/video-s4-5-heilbron.html>. Hermione Lee, expert in English literature and biographer, holds on the other hand that the more a biography is rich in small details, the happier the reader is. See Hermione Lee, *Body Parts: Essays in Life-Writing* (London: Chatto & Windus, 2005).

interpretive – required to write about a man or a woman’s life we know we shall never be able to produce a recipe useful for writing about another’s life. The conclusion to be drawn may be a radical one: when we write, and not just when we write biographies, we are writing about ourselves too. For this reason, to pay some attention to the ‘I’ who writes, and to adopt an amount of skepticism and auto-irony also in connection with our own and our biographee’s gender, is highly recommended.

On the other hand, who hasn’t found her/himself in the situation of that character of Italo Calvino’s, a writer experiencing a creative crisis who exclaims angrily: ‘How well I would write if I were not here!’⁶⁷

67 Italo Calvino, *If on a Winter’s Night a Traveler* (New York: Harcourt, 1981), p. 171 (1st orig. ed. 1979).