

## Essay review

### Agnes Arber, historian of botany and Darwinian sceptic

Agnes Arber, *Herbals: Their Origin and Evolution. A Chapter in the History of Botany, 1470–1670*. Cambridge: Cambridge University Press, 1912. Pp. 408. ISBN 978-1-1080-1671-1. £45.99 (paperback).

Agnes Arber, *The Mind and the Eye: A Study of the Biologist's Standpoint*. Cambridge: Cambridge University Press, 1954. Pp. xi + 146. ISBN 978-0-5213-1331-5. £14.99 (paperback).

This essay aims to reappraise Agnes Arber's contribution to the history of science with reference to her work in the history of botany and biology. Both her first and her last books (*Herbals*, 1912; *The Mind and the Eye*, 1954) are classics: the former in the history of botany, the latter in that of biology.<sup>1</sup> As such, they are still cited today, albeit with increasing criticism. Her very last book was rejected by Cambridge University Press because it did not meet the publisher's academic standards – we shall return to it in due course. Despite Kathryn Packer's two essays about Arber's life in context, much remains to be done toward a just appreciation of her research.<sup>2</sup> We need such a reappraisal in order to avoid anachronistic criticisms of her contributions to the historiography of botany, or, on the other hand, uncritical applause for her studies in plant morphology.

Agnes Arber's work on the history of botany, particularly the book *Herbals: Their Origin and Evolution. A Chapter in the History of Botany, 1470–1670* (Cambridge, 1912, 1986) is still considered a major source on the subject.<sup>3</sup> Rebecca Laroche referred to it as the bible of the history of botany.<sup>4</sup> Fernando Vega has found it useful as a

1 Joan Mason, 'The women fellows' jubilee', *Notes and Records of the Royal Society of London* (1995) 49(1), pp. 125–140, 129.

2 Kathryn Packer, 'A laboratory of one's own: the life and work of Agnes Arber, F.R.S. (1879–1960)', *Notes and Records of the Royal Society of London* (1997) 51(1), pp. 87–104; Packer, 'Arber, Agnes', ODNB, at <https://doi.org/10.1093/ref:odnb/30427> accessed 16 November 2018.

3 J.M.C., review of Agnes Arber's *Herbals: Their Origin and Evolution. A Chapter in the History of Botany, 1470–1670*, *Botanical Gazette* (1913) 56(3), p. 232. The author pointed out the usefulness of the text, and, above all, of its pictures. P.M. Smith, review of Agnes Arber's *Herbals: Their Origin and Evolution. A Chapter in the History of Botany, 1470–1670*, *New Phytologist* (1987) 107(2), p. 486. Smith stated: 'The strength of the work arose from a happy integration of the many kinds of insight possessed by this author'.

4 Rebecca Laroche, review of Leah Knight's *Of Books of Botany in Early Modern England: Sixteenth-Century Plants and Print Culture*, *Renaissance Quarterly* (2009) 62(4), pp. 1347–1348. Laroche calls Knight's book 'an admirable accomplishment that brings Adrian Johns in dialog with Agnes Arber with wit

reference on *Dioscorides*.<sup>5</sup> Christine Ruane used *Herbals* as her main source of information on, indeed, early modern herbals, as well as on what we would call today ‘botanical communities of scholars’.<sup>6</sup> Winkler and Van Helden cite *Herbals* as an early work on the importance of considering pictures as important sources both in art and in science.<sup>7</sup> Elizabeth Eisenstein, in her seminal 1969 article ‘The advent of printing and the problem of the Renaissance’, cited Arber’s essay ‘From medieval herbalism to the birth of modern botany’ as a fundamental source on the technical advances in illustrations appearing in printed herbals.<sup>8</sup> By contrast, Sachiko Kusakawa has criticized Arber’s mordant judgement of Leonhart Fuchs’s herbal as being unimportant in the history of plant taxonomy.<sup>9</sup>

From Arber’s interest in early modern herbals stemmed her research in a number of seventeenth-century English and French natural philosophers who studied plants, such as Nehemiah Grew, John Ray and Guy de la Brosse.<sup>10</sup> Historians such as Barbara Shapiro and Michael Hunter have cited this research as a pioneering source of factual information about them.<sup>11</sup> Yet, despite the usefulness of Arber’s labours, it would be inaccurate to call her a historian. She always approached the lives of people interested in plants from the point of view of her Aristotelian and Neoplatonic philosophies. Moreover, she always added quotations from literary authors. Indeed, several reviewers have praised the beauty of her English as the most striking feature of her works in the

and seeming ease’ (p. 1348), pointing to *Herbals* being the book on botanical history in the same way as Adrian John’s *The Coming of the Book* is the bible of book history.

5 Fernando E. Vega, review of Stephen Harris’s *The Magnificent Flora Graeca: How the Mediterranean Came to the English Garden*, *Quarterly Review of Biology* (2008) 83(3), pp. 319–320. *Herbals* is quoted on p. 319.

6 Christine Ruane, ‘Eighteenth-century botanical literature and the origins of an elite Russian gardening community’, in Maria Di Salvo, Daniel H. Kaiser and Valerie A. Kivelson (eds.), *Word and Image in Russian History: Essays in Honor of Gary Marker*, Boston: Academic Studies Press, 2015, pp. 55–70. Ruane cites Agnes Arber’s *Herbals* on p. 69.

7 Mary G. Winkler and Albert van Helden, ‘Representing the heavens and visual astronomy’, *Isis* (1992) 83 (2), pp. 195–217, they cite Arber on p. 202. On the pre-Kempian nature of Arber’s *Herbals* see Martin Kemp, *The Science of Art*, New Haven, CT: Yale University Press, 1990.

8 Elizabeth L. Eisenstein, ‘The advent of printing and the problem of the Renaissance’, *Past & Present* (1969) 45, pp. 19–89. On pp. 71, 73 Eisenstein cites Arber’s ‘From medieval herbalism to the birth of modern botany’, in E. Ashworth (ed.), *Science, Medicine, and History: Essays ... in Honor of Charles Singer*, vol. 1, Oxford: Oxford University Press, 1953, pp. 317–336, as a source on the technical advances by new illustrations in printed herbals.

9 Kusakawa thinks Arber’s point unimportant on account of the peculiar kind of argument which Fuchs made about the proper academic study of plants. Sachiko Kusakawa, ‘Leonhart Fuchs on the importance of pictures’, *Journal of the History of Ideas* (1997) 58(3), pp. 403–427; criticism of Arber’s *Herbals* on p. 404.

10 Agnes Arber, ‘The botanical philosophy of Guy de la Brosse: a study in seventeenth-century thought’, *Isis* (1913) 1(3), pp. 359–369; Arber, ‘A seventeenth-century naturalist: John Ray’, *Isis* (1943) 34(4), pp. 319–324; Arber, ‘Robert Sharrock (1630–1684): a precursor of Nehemiah Grew (1641–1712) and exponent of “natural law” in the plant world’, *Isis* (1960) 51(1), pp. 3–8.

11 Barbara J. Shapiro, ‘The universities and science in seventeenth century England’, *Journal of British Studies* (1971) 10(2), pp. 47–82. Shapiro cites Arber on p. 70 for her article on Robert Sharrock as the only source about him, so superseding the *DNB* and preceding the new *ODNB*. Michael Hunter, ‘Early problems in professionalizing scientific research: Nehemiah Grew (1641–1712) and the Royal Society, with an unpublished letter to Henry Oldenburg’, *Notes and Records of the Royal Society of London* (1982) 36(2), pp. 189–209. Hunter cites Arber’s work on Grew on p. 204.

history of botany.<sup>12</sup> Her essay on Guy de la Brosse, for instance, is revealing of her way of proceeding. Arber's philosophical interests extended into a theological dimension, inspired by personal commitments. She wrote of 'plant souls' in an atomistic, Neoplatonic sense: when a plant dies, its seed – or soul – goes back to the Earth, waiting to be born again to life in a new form. Arber's lifelong interest in literature is reflected in her use of literary texts as authoritative sources about plant souls, for example when she quotes William Wordsworth and Thomas Carew.<sup>13</sup> In her paper on John Ray, however, there is nothing about Ray's religious outlook despite his choice to resign from Cambridge in 1662 on doctrinal grounds.<sup>14</sup> On the other hand, Arber did comment on God's place in Ray's thinking at the very end of her essay, pointing to the necessary unity – and harmony – between the study of nature and the study of God.<sup>15</sup>

Non-religious contexts for science were not so central to Arber's concerns. In a 1938 review, Arber sounded uneasy with the task of assessing a proper work of intellectual history: 'Much of Prof. Hryniewiecki's biographical study is occupied with a detailed survey of the intellectual milieu in which Schneeberger lived, and of the cultural relations existing at that period between Switzerland and Poland – topics which fall outside the scope of the present notice'.<sup>16</sup> Arber was not an intellectual historian, despite claims to the contrary.<sup>17</sup> Her contribution to the history of botany lies,

12 Jeanne Goode, review of Agnes Arber's *Herbals: Their Origin and Evolution. A Chapter in the History of Botany, 1470–1670*, *Brittonia* (1988) 40(1), p. 47. Goode praised Arber's style above all: 'her elegant prose demonstrates that precision of thought can result in beauty of language, and that science need not preclude literature'. A.G. Tansley, review of *The Natural Philosophy of Plant Form*, by Agnes Arber, *New Phytologist* (1952) 50(3), pp. 400–403, 400: 'Dr. Agnes Arber is the most distinguished as well as the most erudite contemporary British plant morphologist ... a lucid and graceful English which few scientific writers can rival', indeed her way of weaving her narrative like a literary piece is distinctive, and makes one wonder how much her not possessing an academic post might have freed her style thus.

13 Agnes Arber, 'The botanical philosophy of Guy de la Brosse', op. cit. (10), p. 363, on souls. On p. 362 she cites from Wordsworth's *Lines Written in Early Spring*, April 1798: 'The budding twigs spread out their fan, To catch the breezy air; And I must think, do all I can, That there was pleasure there'. Earlier in the same poem, Wordsworth had been even more explicit about his Neoplatonic views: 'To her fair works did Nature link / The human soul that through me ran'. On p. 363 Arber cites Thomas Carew along similar lines.

14 Ray refused to subscribe to the Act of 1662 that declared the 1643 Solemn League and Covenant to have been an unlawful oath. See <http://bcw-project.org/church-and-state/first-civil-war/solemn-league-and-covenant> as accessed on 5 March 2019. Arber, 'A seventeenth-century naturalist', op. cit. (10).

15 Arber, 'A seventeenth-century naturalist', op. cit. (10), p. 324.

16 Agnes Arber, review of B. Hryniewiecki's *Anton Schneeberger (1530–1581) ein Schüler Konrad Gesners in Polen*, *New Phytologist* (1938) 37(5), p. 480.

17 Jonathan Z. Smith, 'Morphology and history in Mircea Eliade's "Patterns in Comparative Religion" (1949–1999)', *History of Religions* (2000) 1(4), pp. 315–331. The author implies that Arber wrote about Goethe as an intellectual historian would (p. 319). As Peter Gordon has pointed out, 'perhaps the most classic example (of early intellectual history) is the book by Arthur Lovejoy, *The Great Chain of Being* (originally given as the William James Lectures at Harvard University in the mid 1930s)'. Peter E. Gordon, 'What is intellectual history? A frankly partisan introduction to a frequently misunderstood field', at [https://scholar.harvard.edu/files/pgordon/files/what\\_is\\_intell\\_history\\_pgordon\\_mar2012.pdf](https://scholar.harvard.edu/files/pgordon/files/what_is_intell_history_pgordon_mar2012.pdf), p. 2, accessed 22 November 2018. James L. Larson, 'Goethe and Linnaeus', *Journal of the History of Ideas* (1967) 28(4), pp. 590–596. On p. 591 Larson cites Arber for her work 'Goethe's botany', *Chronica Botanica* (1946), 10(2), p. 70, in which Arber used the expression 'intellectual history' to describe the context of Goethe's early interest in botany from the point of view of his past readings up to the point when he discovered

rather, in the wealth of information she published about early modern printed herbals, and, to a lesser extent, about a few key figures of the so-called Scientific Revolution. Arber's work did not contribute much to the history of medicine, despite the obvious link between herbals and medicine. John Riddle has found this puzzling, especially given Arber's scientific training.<sup>18</sup> In fact, Arber's lack of interest in the history of medicine is rooted in her anti-evolutionary priorities, which shaped her scientific methodology and, consequently, all her published works. Thus in her essay on John Ray, Arber wrote, 'in those days the limitations of the experimental method were not yet realized, and the highest hopes were raised by it'.<sup>19</sup> The issue of methodology in biology is crucial if we are to get to grips with Arber's contribution to the history of science. I shall now contextualize her anti-evolutionary spiritual philosophy, which formed the basis of her plant morphology.

Agnes Arber (née Robertson) was born in Victorian London, in 1879, to a wealthy middle-class family that supported her education.<sup>20</sup> From an early age, Arber liked to observe plants, admiring the beauty of natural shapes. She attended North London Collegiate School for Girls (NLCS), whose elderly mistress, Miss Frances Buss, had been active with the Taunton Commission Enquiry into Education (1864–1868). The NLCS placed much emphasis upon girls' needs to acquire a proper grounding in science in addition to the usual learning associated with polite conversation. In this respect, Arber's schooling reflected the most progressive Victorian views on girls' education; it included a string of formal examinations, just as boys' did. Arber would later acknowledge Miss Buss's influence in her developing a taste for science.<sup>21</sup> At the NLCS, Arber found in botany the ideal subject whereby to marry her artistic appreciation of plant forms with an intellectual curiosity that was satisfied by studying them scientifically. Arber's first published work (1894) reflected both modes of inquiry, being an illustrated study of the ivy-leaved toadflax.

Two NLCS teachers with Cambridge connections greatly influenced Arber's subsequent research practices, namely Edith Atkin and Ethel Sargant. Miss Edith Atkin, an alumna of Girton College, encouraged Arber to read Goethe's work on plants. Arber subsequently learnt German well enough to publish her own translation of Goethe's *Metamorphosis of Plants* in 1946.<sup>22</sup> Most biologists treat his incursion into their subject as a curiosity in the history of botany. Arber's lifelong interest in Goethe's botanical meanderings is, however, key in appreciating the importance of her Victorian years. Her interest in plant morphology began to bud in the late 1890s, while she was still at school. She nourished it, by combining art, literature, and philosophy in a religious

Linnaeus. To infer from such usage in Arber's writings that she was herself an intellectual historian is misleading.

18 John M. Riddle, review of Agnes Arber and William T. Stearn's edition of *Herbals: Their Origin and Evolution. A Chapter in the History of Botany, 1470–1670, Systematic Botany* (1988) 13(3), p. 473.

19 Arber, 'A seventeenth-century naturalist', op. cit. (10), p. 324.

20 Packer, 'Arber, Agnes', op. cit. (2).

21 Packer, 'A laboratory of one's own', op. cit. (2), p. 86.

22 Smith, 'Morphology and history', op. cit. (17), p. 319; Arber is cited again on pp. 320, 327.

manner.<sup>23</sup> Goethe's powerful words about the beauty of Mother Nature – a central theme in the *Sturm und Drang* rhetoric of which he was a master – captured her young imagination. The finesse of his quasi-religious Neoplatonic reasoning, in apparent harmony with Aristotelian notions of form and teleology – as well as with Linnaean taxonomy – made Goethe seem to her like an inspired natural philosopher, a wise man of Enlightenment science who had caught a glimpse of eternal truths which Darwinism was in danger of making redundant. Arber's interest in Goethe with regard to biology was not unique; rather, it reflected a widespread scholarly interest in both Europe and America in the 1880s.<sup>24</sup> Kathryn Packer has called Goethe's influence on Arber's lifelong work 'tremendous'.<sup>25</sup> Arber had the intellectual tools to appreciate Goethe thanks to the classical education she had received in the 1890s.

Arber's school education was marked by the study of the Classics to an extent which has become hard to appreciate today, but which was common in certain classes in the UK until the 1960s. Arber was intimate with the thought of Aristotle, Plato, the newly called 'pre-Socratics' and the Neoplatonists. In 1954 she published what Raymond Whitehead has defined as a 'testament to biology', namely *The Mind and the Eye*.<sup>26</sup> That year, Cambridge University Press put out Erwin Schrödinger's *Nature and the Greeks*, and Galileo Galilei's *Dialogue Concerning the two Chief World Systems*, translated by Stillman Drake, with a foreword by Albert Einstein; Ernst Cassirer's *The Platonic Renaissance in England*, translated by James P. Pettegrove, appeared in Edinburgh. That same year, Stiernotte published an essay in the *American Scientist* in which he discussed notions of quantum physics versus biology within a philosophical argument about fractured reality versus wholeness. He did so by means of a comparison of Schrödinger's and Arber's respective works. Stiernotte's piece neatly reflects the influence of the Classics on the education of scientists as well as among more non-specialist audiences.<sup>27</sup> Arber's work was in tune with the times, even though her own particular take on philosophy was driving her more and more to the fringes, as we shall see shortly.

Arber was conversant with medieval philosophers, too, and read Dante as much as Shakespeare. Indeed, one finds them all in *The Mind and the Eye*. One reviewer wrote of it,

The general theme is that many paired concepts, such as form and function, body and mind, and mechanism and teleology, are artifacts and therefore imperfect representations of a higher unity, the final aim of biology being the fusion of the metaphysical and scientific

23 Not all Victorians approached botany in this way; some, like Arber, did, and it is important to bear this in mind when dealing with her methodology. The literature on Victorian science is huge. I refer readers to Francis O'Gorman (ed.), *The Cambridge Companion to Victorian Culture*, Cambridge: Cambridge University Press, 2010, for a preliminary historiographical overview.

24 Peter J. Bowler, *El eclipse del darwinismo: Teorías evolucionistas antidarwinistas en las décadas en torno a 1900* (transl. of *The Eclipse of Darwinism*, Baltimore: Johns Hopkins University Press, 1983), Barcelona: Editorial Laba, 1985, p. 128.

25 Packer, 'A laboratory of one's own', op. cit. (2), p. 88.

26 Raymond Whitehead, 'A biologist's philosophy: review of *The Mind and the Eye: A Study of the Biologist's Standpoint* by Agnes Arber', *British Medical Journal* (1954) 1(4863), p. 689.

27 Alfred P. Stiernotte, 'Scientists as philosophers', *American Scientist* (1954) 42(4), pp. 650–657. On pp. 652–655 the author discusses Arber in relation to Schrödinger.

thinking. If this book were medieval its author would have been concisely designated (and justly renowned as) *Agnes Concliatrix*.<sup>28</sup>

Arber was so sure of her classical background that she did not fear venturing into a highly speculative essay on ‘Spinoza and Boethius’, which I suspect would not pass peer review today.<sup>29</sup> The central claim – that Spinoza’s main source of inspiration for his *Treatise on God, Man, and His Wellbeing* was Boethius’s *De Consolatione Philosophiae* – is ungrounded. Arber herself admitted being unable to locate Spinoza’s own copy of Boethius’s work; indeed, ‘no book by Boethius is named in the inventory of Spinoza’s effects made after his death’.<sup>30</sup> Yet it would be unfair and anachronistic to judge Arber’s historiographical and biological work by current standards. While more stringent criteria of evidence selection and evaluation have become the norm, one might also lament that classical knowledge such as Arber exercised has declined sharply.

Arber’s fine classical education is perhaps what comes through the most from reading her works. This is hardly surprising when one bears in mind the chronology of her studies, which began in Victorian London. The arts, the Classics and German literature awoke Arber’s taste for plant forms. Interestingly, her first lab work occurred not in school surroundings, but rather in the back garden of Cambridge alumna and NLCS teacher Miss Ethel Sargant. The latter had a complicated personal life which accounts at least to a large extent for her choice to become a London teacher after reading natural sciences at Girton College. Cambridge University excluded women fellows in the 1890s: instead, Sargant cared for her elderly mother and learning-disabled sister. Sargant nevertheless set up a backyard laboratory where she worked in informal domestic settings, disconnected from examinations, competitiveness and tight schedules. Arber, too, began lab work in similar domestic settings; she must have liked it very much, and by contrast, she later recollected her time at the NLCS as having been marked by too many examinations and strict time management. She chose botany as her field of university study as a consequence of, above all, artistic, literary and philosophical curiosity, after just a little dabbling in ‘proper’ biological lab experiments. She went on to read for her undergraduate degree at University College London (UCL), where she was taught by, among others, Professor Arthur Tansley, whose judgement on Arber’s life achievements in biology will later allow me to shed light on her ‘exclusion’ from a Cambridge career.

Arber enrolled at Newnham in 1899, finishing with a first in natural sciences in 1902.<sup>31</sup> She moved out of Cambridge and back into Sargant’s home lab. Next, she won a research studentship at UCL. Her time in Bloomsbury (the location of UCL) would prove rife with change. Here she met her future husband, Edward Newell Arber. She resigned from a recent academic appointment on their marriage, and

28 Whitehead, op. cit. (26), p. 689.

29 Agnes Arber, ‘Spinoza and Boethius’, *Isis* (1943) 34(5), pp. 399–403.

30 Arber, op. cit. (29), p. 400.

31 Newnham women students could, by this date, obtain a certificate of attendance with course name and final results, which was not yet, however, a proper degree certificate. See <https://newn.cam.ac.uk/about/history/history-of-newnham>, accessed 5 March 2019.

followed her husband to Cambridge. Her interests in plant morphology led her to delve deeper into both science and philosophy. In UCL first, and later in Cambridge, Arber began to question Darwin as a result of her philosophical beliefs. Indeed, in the 1890s most biologists were against Darwinism. The issue was not evolution; rather, it was natural selection, because no one had yet managed to demonstrate experimentally that natural selection could cause change in a species. Physicists, in particular, such as Lord Kelvin, were the main obstacles, because they argued mathematically that the Earth was not old enough for natural selection to have changed it to an extent consistent with Darwinian theories. As is well known by historians of biology, even Alfred Russel Wallace, co-discoverer of evolution by means of natural selection, doubted its ability to explain the mental attributes of humans and retained a strong commitment to spiritualism. Arber's growing questioning of evolution became a mark which put her out of favour with fellow biologists, including her former supervisor, Tansley. His review of *The Natural Philosophy of Plant Forms* says it all. According to Arber, the morphology of flowering plants 'reaches its fullest reality in the region of natural philosophy, where it converges upon metaphysics, to which it brings its own, distinctively visual, contribution'. Arber used the word 'form' in a fully Aristotelian sense in order to show that there is no difference between form and function in plants. In this way, 'living organisms' involved form (structure) as well as function. This implies, as Tansley recognized, an 'anti-evolutionary bias', which permeates the whole book – and, I would add, all her work. Tansley asserted that Arber overemphasized nineteenth-century Darwinians' inclination to personify and deify chance in natural selection. 'If anyone did deify the laws of chance, these were atomic physicists'.<sup>32</sup> Likewise, Tansley observed that Arber's reflection on Darwinism being now no longer 'dominant' must be corrected with reference to a number of seminal works on the useful application of Darwinism to various scientific fields. As Tansley pragmatically stated in the final sentence of his review, 'Have Plato's "forms" or Aristotle's "formal causes" any relevance at all to the objective study of nature?'<sup>33</sup>

The undeniable sexism of Arber's colleagues has been used to explain the rejection of her anti-evolutionary claims. Michael Boulter, for instance, has stated,

Arber ... was sidelined by unimaginative male colleagues who did not like the way she kept raising difficult issues ... [her] broad view and questioning approach fitted some of the new social thinking of those times, but it was met with indifference among the growing number of biologists who measured things. When she suggested that 'urges', 'endeavours' and even 'perseverance' might explain the compulsion that makes living things work, very few scientists took her seriously.<sup>34</sup>

Packer, too, has contextualized Arber's years at Cambridge as an independent scholar by focusing on the misogynistic mischief which forced her out of formal academe.<sup>35</sup> Despite

32 Tansley, op. cit. (12).

33 Tansley, op. cit. (12), p. 403.

34 Michael Boulter, *Bloomsbury Scientists: Science and Art in the Wake of Darwin*, London: UCL Press, 2017, pp. 81–82.

35 Packer, 'A laboratory of one's own', op. cit. (2), pp. 91–98.

misogyny, however, Arber became the third woman to be elected fellow of the Royal Society, as well as winner of the Gold Medal of the Linnean Society, in addition to further honours. Boulter's and Packer's gendered stories should be nuanced in light of this reappraisal of Arber's contribution to the history of science. Arber was excluded not just on account of her sex, but because her beliefs, as reflected in her publications, became increasingly out of fashion, and therefore out of touch, with current scientific practices. Arber's anti-evolutionary stance continued to shape her work from her student days until her very last book. Her scientific premises did not evolve. While they were perfectly in tune with the times in the late 1890s and early 1900s, they had morphed into minority thinking by the 1940s and 1950s. Arber's male academic colleagues, instead, changed their minds. The discovery of radioactivity, by increasing the calculated age of the Earth, contributed to physicists' acceptance of natural selection, thereby gaining Darwinism the support of a disproportionately important part of the scientific community in the aftermath of the Second World War. Arber, instead, continued to regard plants as soul-imbued entities, in a philosophical way; that is, in a way that hard scientists were no longer regarding as acceptable in science. On the other hand, Arber's contribution to the history of science lies, first, in the wealth of useful factual information about the history of herbals, and, second, in her studies of plant morphology. Biologists today presume to strip Arber's work of its philosophical and spiritual angles in order to focus on their botanical content alone. The evolution of academic discourse in the sciences has eradicated both theology and philosophy from the equation. Today's scientists also, in general, lack the necessary education in the Classics which one needs in order to appreciate the depth, elegance and finesse of Arber's work.

Historians of botany, especially in the English-speaking world, keep reading Arber's work because it contains much accurate information about some key figures in the history of early modern science, but like scientists they perhaps do her an injustice in presuming to mine it for certain content only. Arber combined the practice of science and scientific historiography in a manner that is, certainly, challenging to professional scientists, but perhaps equally so to historians. She pursued botany via history, which is troubling to both sets of professionals. One notes with relative glibness how her wrong historico-philosophical queries placed her – eventually – outside the scientific mainstream, but we would do well to ask, symmetrically, why she is not more widely recognized as a historic practitioner in the history of science.

*The Manifold and the One* (1957) was Arber's last published work. It contains Neoplatonic pantheistic views, this time buttressed with Buddhist, Hindu and Taoist materials. The decision of Cambridge University Press to reject it due to poor academic standards was understandable; it was not an academic work but rather a speculative essay mixing biological concepts with an array of philosophical ideas from disparate schools. Besides, in the 1950s the press was still catering for an essentially academic readership. Arber's last book did not work in this context at all. Instead, it was a fitting final word to the eclectic intellectual career of a lady of science. Arber's papers are kept today in the Hunt Institute, Carnegie-Mellon University, Pittsburgh, Pennsylvania. This reappraisal could pave the way for further and deeper

examinations of Arber's scholarly methodology. One may disagree with her that plants connect the macrocosm to the microcosm, but one should be in awe of her ability to connect the beauty of Wordsworth's poetry, to Plato's philosophy, to complex notions of plant morphology.

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