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Articles

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Article Reviews

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About the JLS

The Journal of Literature and Science (JLS) is a peer-reviewed academic journal presently published annually. It is hosted by the Research Centre for Literature, Arts and Science at the University of Glamorgan. Each issue appears online only and is free to access. Each individual essay within an issue is made available in PDF format for download.

The journal is dedicated to the publication of academic essays on the subject of literature and science, broadly defined. Essays on the major forms of literary and artistic endeavour are welcome (the novel, short fiction, poetry, drama, periodical literature, visual art, sculpture, radio, film and television). The journal encourages submissions from all periods of literary and artistic history since the Scientific Revolution; from the Renaissance to the present day. The journal also encourages a broad definition of 'science': encapsulating both the history and philosophy of science and those sciences regarded as either mainstream or marginal within their own, or our, historical moment. However, the journal does not generally publish work on the social sciences. Within these confines, essays submitted to the journal may focus on the literary and scientific productions of any nation or group.

All essays should be interdisciplinary in focus, offering an original view of both the literary or artistic subject matter and the science or sciences under consideration. While essays on individual examples of literary and artistic production are welcomed, these should also seek to show the wider significance of their analyses and interpretations. The journal does not publish essays focused exclusively on literature or art, or exclusively on the history and philosophy of science.

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Introduction
Botanising Women: Transmission, Translation and European Exchange

Sam George and Alison E. Martin

The papers published in this special themed issue of the *Journal of Literature and Science* on women and botany are part of a project which developed from a panel at the 2009 British Society for Literature and Science conference. Our title, *Botanising Women: Transmission, Translation and European Exchange*, illustrates the project's overall themes: the circulation of European ideas (notably Linnaeanism and Rousseauism) by women, inside and outside the botanical text, the transmission of botanical knowledge, through an exchange of plants and specimens and through the familiar format of letters and dialogue), and the exchange of ideas around gender and natural science, both culturally and in terms of translation.

As guest editors we think botany is deserving of a special issue. The interrelation between botany and literary production has been a swiftly developing area of scholarship over the past decade. Monographs by Molly Mahood (*The Poet as Botanist*, 2008), Sam George (*Botany, Sexuality and Women's Writing, 1760-1830: From Modest Shoot to Forward Plant*, 2007) and Amy M. King (*Bloom: The Botanical Vernacular in the English Novel*, 2003) demonstrate in their various ways how under-researched the relationship between literary writing and botany in the eighteenth and nineteenth centuries has been. Botanical texts for and by women have broad cross-disciplinary appeal (the visual arts, travel writing, education, history of science etc.) and illustrate the cross-fertilisation of literature and science in women's writing particularly well, whilst opening up crucial debates around gender, sexuality and culture. The botanical texts we have chosen have largely been ignored by historians of science because of their informal literary format and overlooked by literary scholars because of their scientific content. Botanising women favoured 'familiar' genres of writing that were confessional, dialogic, conversational or epistolary in style. This continued right up to the end of the Victorian era, as is demonstrated by the work of Emily Lawless (1845-1914), whose diaries and journals combined botany with life-writing and reflection. Such textual strategies caused the female botanist to be sidelined as a mere populariser by some, but it is precisely this feminisation of botanical knowledge that exemplifies our main themes of sociability, transmission and exchange, inextricably tied, as it is in its published form, to sociability and scientific networks. The articles aim to bring these compelling, essentially hybrid texts, into prominence and assign them a proper place in the histories of science, eighteenth- and nineteenth-century literature and women's writing. Botany would never again be quite so topical or fashionable and these texts serve to remind us of this, while allowing us to consider the reasons why women's botany in particular became so prominent and so controversial.

We open with an introduction that traces the context within which British women were writing and botanising in the Enlightenment and briefly describes the Linnaean sexual system of reproduction and its attendant problems for botanically-minded women and follows the development of botany for women into the nineteenth century. The first article, by Sam George, offers a detailed analysis of two key late-

eighteenth-century botanical texts for women, which serves as the framework for interpreting representations of botany and the feminine in the articles which follow. The themes of transmission, translation and cultural exchange begin to emerge here and these are taken up and developed in articles by Alison E. Martin, Betty Hagglund, and Heidi Hansson. We interrogate in detail a small number of key related texts and tease out the connections, influences, revisions and resistances that shaped women's engagement with botany in the period from 1780 to 1900.

The Enlightenment was the period in which botany came of age. In the course of the eighteenth century, people's way of viewing and thinking about the natural world changed irrevocably. The Swedish botanist Carl Linnaeus (1707-78) revolutionised plant taxonomy from the 1730s onwards with the publication of the *Systema Naturae* (1735) and the *Species Plantarum* (1753). These works described his new organisation of plants into twenty-four classes according to the number of stamens and carpels in a flower and reduced the long descriptive labels for plants to two names only, genus and species. It was not until after mid-century that Linnaeus's ideas took off in Britain – the first English translation of Linnaeus's *Philosophia Botanica* (1751) was James Lee's *Introduction to Botany* (1760) – but by the 1770s, the Linnaean system was firmly established in British thinking about plant classification and sexual reproduction. Just ten years after Linnaeus's death, Sir James Edward Smith (translator of Linnaeus's *Dissertation on the Sexes of Plants* into English in 1786) founded and became the first President of the British Linnean Society.

Meanwhile beyond the world of institutionalised and (semi-)professional science, botany had become a 'polite' pursuit for wealthy aristocrats. Key among them were Princess Augusta, mother of George III, who orchestrated the creation of the Royal Botanic Gardens at Kew in 1759 and Queen Charlotte, hailed as George's 'Scientific Wife', who, together with her daughters, was instructed in botanical drawing by the artist Francis Bauer. The eighteenth century was also the age of exploration and scientific travel, and Captain Cook, Sir Joseph Banks and the Forsters ensured that these gardens were well-stocked with exotic plants when they returned from their South Sea voyages in the 1770s. Botanical illustration also gained in popularity both as a profession (notably in the works of Georg Dionysius Ehret) and as an amateur pursuit – exemplified by the far from dilettantish late-century flower paper mosaics by Mary Delany.[1] The Duchess of Portland, a close friend of Delany's, was not only an important figure in British women's botany but also in the activity of plant collecting and exchange (Cook 142-56). By the time that the Horticultural Society had been founded in 1804 (it gained its 'Royal' status in 1861) botany and horticulture had been put fairly and squarely on the map.

Women of rank and status were therefore ensuring that the pursuit of botany attracted an ever wider audience in late eighteenth-century Britain. But not everyone considered botany to be a science inclusive of both sexes. One of the earliest proponents of British women's botany, William Withering, attempted to "fair sex" it by omitting the sexual distinctions in the titles to the Linnaean classes and orders when he produced his *Botanical Arrangement of All Vegetables Naturally Growing in Great Britain* in 1776 (George, *Botany, Sexuality and Women's Writing* 48). In the 1790s, the reactionary poet, topographer and naturalist, the Reverend Richard Polwhele, was unable to comprehend how an examination of a plant's organs of generation could be conducive to female modesty. In his polemical poem *The Unsex'd Females* (1798), he warned that botanising girls anatomising the sexual parts of the flower were indulging in acts of wanton titillation (lines 29-34).[2] His text reflects the

spread of Linnaean ideas in England but also articulates the anxieties surrounding the figure of the female botanist in the last decade of the eighteenth century. While Linnaeus had described plant reproduction using relatively anodyne wedding imagery and marriage metaphors, it was these very analogies between plant and human reproduction that caused such furore. In Britain they were exacerbated by Erasmus Darwin's provocative poem *The Loves of the Plants* (1789) – its first edition published from the safe vantage-point of anonymity – which accentuated the sexual dimensions of plant reproduction, making of it a rollicking, licentious affair.

Polwhele's blistering remarks were as much a reaction against women's involvement in science, and specifically Linnaean botany, as their access to knowledge. They were also intended as a salvo levelled against Mary Wollstonecraft's *Vindication of the Rights of Woman* (1792), in which she had poured scorn upon the writer who had queried whether women might be instructed in the modern system of botany and yet retain their female modesty, and had decided that they could not (Wollstonecraft 277; Berkenhout 307). "Thus is the fair book of knowledge to be shut with an everlasting seal!", she tartly concluded (Wollstonecraft 277). Wollstonecraft, like a number of enlightened women across Europe, including Emilie du Châtelet, saw that the natural sciences – Wollstonecraft particularly singled out "botany, mechanics and astronomy" – could improve women's and children's understanding of the world around them (388). But she railed against the linguistic conventions of the time that associated women with flowers as images of purity, beauty and fragility, perpetuating a femininity that was decorative rather than practical. Society, she argued, nurtured women as if they were exotic plants: "luxuriants", barren rather than productive, bred for beauty rather than utility, and for a life of domestic tedium rather than intellectual curiosity (2).[3]

Despite Polwhele's rhetorical and lyrical fireworks, he was essentially fighting a rearguard action. Women had already gained a firm foothold in the study of botany, not least because they had been identified by publishers as an expanding and lucrative market for works on elementary botany. By the 1790s, a number of elementary botanical works had appeared, authored both by men and women, with a mixed (or sometimes explicitly female) audience in mind. Important among these were the Swiss philosopher and writer Jean-Jacques Rousseau's *Lettres élémentaires sur la botanique à Madame de L**** (1771-74) composed for Madeleine Delessert. These letters, which broke down a range of botanical ideas (notably flower structure, genus, species and seasonal growth) into easily digestible portions, were designed to enable Madame Delessert to introduce her daughter to the study of botany through recognition of different types of plants. Far from being a dry enumeration of different species and their characteristics, the heightened emotional response of his narrator to the natural world conflated botanical practice and the literature of sensibility (George, "Linnaeus in Letters"; King 48). Rousseau thus encouraged botany as a healthy outdoor pursuit, even if he was also resolute that women should not become involved in the more theoretical and abstract aspects of botany (George, "Linnaeus in Letters" 50). The English rendering of this text by Thomas Martyn, Professor of Botany at Cambridge, was both a translation and continuation of Rousseau's work. The *Letters on the Elements of Botany Addressed to a Lady* (1784) explicitly addressed botanising women, exhorting them to:

> go forth into the garden or the fields and there become familiar with nature herself; with that beauty, order, regularity, and inexhaustible variety which is

> to be found in the structure of vegetables; and that wonderful fitness to its end, which we perceive in every work of creation. (Rousseau v)

It thus made of botany an outdoor pursuit that offered women (limited) freedom to investigate the natural world.

The burgeoning market for elementary works on botany gave women valuable opportunities to enter into scientific authorship. Particularly in the last decade of the eighteenth century, a number of important publications appeared which included the Quaker writer Priscilla Wakefield's epistolary *Introduction to Botany; in a Series of Familiar Letters* (1796), Maria Jacson's *Botanical Dialogues between Hortensia and her Four Children* (1797) and Charlotte Smith's *Conversations Introducing Poetry Chiefly on the Subject of Natural History* (1804), all of which were key examples of women's increasing visibility in scientific authorship. Popular science works – earmarked for children, women and general readers – offered women greater possibilities to demonstrate and pass on their knowledge. So prolific were British women in the authoring of elementary botanical works that England outstripped its European neighbours in the domain of popular science writing (Shteir, "Finding Phebe" 154). Recent research on female engagement with botany has done much to rescue women from obscurity. Scholarship on Charlotte Smith, for example, has shown how her poem "Flora" imitated the subject matter and versification of Darwin's *Loves of the Plants* but rewrote it in a virtuous manner to make it a model of moral instruction for young people (George, *Botany, Sexuality and Women's Writing* 124). The intellectual value of botany for women has already been stressed: but more recent research has also emphasised the pulls of botany towards both sociability and solitariness, and have shown specifically how Smith's botanical writing might also have operated as a form of therapy for Smith as she fought against the debilitating effects of melancholia (Dolan 106; George, *Botany, Sexuality and Women's Writing* 96).

Women's 'familiar' botanical writing generally drew on the format of the conversation or the letter.[4] The rhetorical proximity of intellectual discourse to the everyday was a key characteristic of conversation in the seventeenth and eighteenth centuries (Fauser 491). Conversation therefore operated as a mechanism by which knowledge of both a seemingly trivial and more 'scientific' nature was transferred. Moreover, the production and exchange of knowledge in this form belonged to a culture of sociability that was deeply rooted in Enlightenment thought. The notions of conversation and science in the eighteenth century were not without their complications, though. Conversation was strongly associated with politeness, a discourse which set a series of behavioural and moral standards and which itself delimited topical content (Klein). Both men and women were consumers of polite science, since polite society was implicitly heterosocial and considered ladies a key ingredient in ensuring that conversation was lively, sometimes flirtatious and certainly pleasant. Making science 'sociable' also demanded that it not be loaded with terminology and hence detract from the civility of the discourse: rather it should engage the mind of the listener/reader through its non-technical language (Walters 127). Epistolarity likewise reinforced the notion of intimacy and familiarity between letter writer and reader-recipient. The emergent genre of the epistolary novel in the eighteenth century not only offered women science writers a template on which to base their writing, but reinforced the link between the expressive possibilities of science writing and other forms of imaginative literature.

By the nineteenth century, botany, and ideas about women's relationship to it, was in a state of flux. If inclusive learnedness was a key characteristic of Enlightenment sociability, during the first two decades of the nineteenth century, some women's magazines began to take a different line altogether towards learning in general and botany in particular (Shteir, "Green-Stocking or Blue?"). While they continued to promote scientific endeavours, the conflicting demands of domestic life and intellectual pursuits meant that women's aspirations were increasingly put under pressure. Although introductory botanical knowledge was not withheld, such magazines also did not provide their female readers with access to more complex botanical material (Shteir, "'Let Us Examine the Flower'"). Linnaean botany had figured significantly in women's improvement in the Enlightenment, but as it came to be dismissed with the increasing acceptance of the "Natural System", botanists began to wonder at the exclusive reception that Linnaeus had received in Britain over the systems proposed by Jussieu, Tournefort and Ray (Shteir, "'Let Us Examine the Flower'" 19). Continental systematics did not mean that Linnaean botany did not continue to be popular and in the *Lady's Monthly Museum* women continued to be encouraged to register their botanical discoveries according to the Linnaean class and order (Shteir, "'Let Us Examine the Flower'" 22). The *British Lady's Magazine*, by contrast, certainly portrayed science as serviceable to women in contributing to their moral improvement or being relevant to women's domestic lives until the 1830s. But beyond that point, it started to shift into a more literary mode, recasting botany in terms of "floral biographies" that placed greater emphasis on the folk uses and historical customs associated with common garden flowers (Shteir, "'Let Us Examine the Flower'" 20-21). As such, then, magazines like this continued to promote science at a general level, but – perhaps because the systematics of the 1820s did not appear genteel enough for a female readership – failed to engage directly with advances in botanical studies.

Not all women were confined to a primarily domestic existence. Indeed as the nineteenth century progressed, British women became increasingly 'mobile', some accompanying male family members on exotic travels to the corners of the Empire (and beyond), others simply indulging in scenic tourism in the British Isles and exploring the picturesque delights of the natural landscape closer to home. Travel to Egypt was closely documented by Hester Stanhope and Lucie Duff Gordon, to Syria and Palestine by Lady Isabel Burton, to India by Anne Elwood and Fanny Parks, and to South America by Maria Graham.[5] Many such accounts were, of course, less concerned with the flora of these foreign climes than their culture and customs, peoples and politics. However, as tourist literature on these lands began to proliferate, women increasingly deployed the aesthetics of the picturesque, particularly detailed landscape description, to differentiate their accounts from those of previous voyagers.

In investigating women's engagement with nature, we have so far primarily explored their activities as readers and writers of botanical works. However, as the circulation of scientific thought within Europe rapidly increased as the eighteenth century drew to a close, the process of translation played an essential role in knowlege circulation and construction, as Thomas Martyn's translation of Rousseau's *Lettres élémentaires* demonstrated.[6] Botanical translation by women as a form of engagement with the science has been almost wholly overlooked. Yet it was increasingly undertaken by British women who, through this seemingly subordinate, uncreative, activity, played an essential role in the international transmission of scientific ideas. Within the genre of botanical poetry, women had been active translators since the end of the Restoration when botany received its first impulses of interest. Aphra Behn,

better known as a playwright and novelist, was the translator not just of Bernard de Fontenelle's popularising astronomical work the *Entretiens sur la pluralité des mondes* (1686) but also Abraham Cowley's *Plantarum* (1668) (*Of Plants VI*, trans. 1689). Translation by women of scientific literature on botany then appears to have lost dynamism until the very end of the eighteenth century, again reflecting the fact that botany only really received a new surge of interest some fifty or so years after Linnaeus's development of a new system of botanical classification. Examples of this second wave of translation are to be found in Albrecht von Haller's *Die Alpen*, translated by "Mrs. J. Howorth", and Maria Henrietta Montolieu's English translation of Jacques Delille's *Des Jardins* (1789/1801) (*The Garden*, trans. 1798/1805).[7] In the nineteenth century, women became markedly more active as translators of scientific prose (not just in the area of botany), with contributions ranging from texts with a more literary bent – such as Eliza P. Reid's translation of Stéphanie de Genlis's *La botanique historique et littéraire* (1810; trans. 1826) – to more scientifically-oriented pieces such as the translation by a "lady" (presumed to be Jane Haldimand Marcet) of Charles François Brisseau de Mirbel's *Elémens de physiologie végétale et de botanique* (1815; trans. 1833) or indeed Emily M. Cox's English rendering of Johann Wolfgang von Goethe's *Die Metamorphose der Pflanzen* (trans. 1863).[8]

The four articles which make up this volume explore women's engagement with botany in the eighteenth and nineteenth centuries from a variety of different angles. Sam George's article analyses the way in which botanical texts were specifically addressed to the female sex. Focusing on two key elementary botanical works in the eighteenth century, Rousseau's *Letters on the Elements of Botany* (1785, trans. Thomas Martyn) and *An Introduction to Botany; in a Series of Familiar Letters* (1796) by Priscilla Wakefield (1751-1832), she explores how epistolarity encouraged women to engage in scientific pursuits. She investigates the way in which Wakefield and Rousseau promoted botany as a feminine pursuit by offering a close-text analysis of the narrating figure of the botanising teacher or governess, and the approach to book-learning articulated by these two authors, as well as the use of Linnaean methodology in these two texts. Sociability and self-education were, she argues, key motivations underpinning this form of writing as botanical texts for women embraced Linnaeus's universal system of classification.

Alison E. Martin continues to explore the transmission of botanical knowledge in a European context, but from a Translation Studies perspective. Likewise drawing on Wakefield's *Introduction to Botany*, she examines how this epistolary piece fared in French translation. The work of a Quaker writer who forcefully promoted women's education and the equality of learning, Wakefield's *Introduction* was translated into French by a male polytechnique-educated aristocrat, Octave Ségur, whose biography and agenda seem diametrically opposed to hers. In its analysis of the French translation of Wakefield's work, the *Flore des Jeunes Personnes* (1801), this article explores how Ségur deliberately politicised her work and rendered it less accessible to women readers through increased use of Latin nomenclature. Most importantly, though, it oriented it away from the achievements of Linnaeus (to whose system Wakefield adhered) towards the work of Ségur's compatriot, Tournefort, thus demonstrating the extent to which national (patriotic) concerns overrode scientific universalism in this period.

The third essay, by Betty Hagglund, analyses the role played by extra-European travel in the lives of botanising British women. Maria Graham (1786-1844), an avid plant collector and illustrator, is an important, neglected, figure in the web of connections between the major botanical gardens in Britain and travelling women.

Graham's time spent in South America allowed her to collect, dry and make illustrations of exotic plant specimens. Drawing on the correspondence between Graham and William Hooker, Professor of Botany at Glasgow University, Hagglund explores how letter-writing and the exchange or donation of botanical specimens involved women at first hand in the construction and development of scientific knowledge. Hagglund's examination of her books on the flora and fauna of Chile and Brazil, as well as her translation of Judas Tadeo de Reyes' *Account of the Useful Trees and Shrubs of Chile*, show how Graham located herself within mid-century networks of plant collecting and botanical women authors and translators.

Finally, Heidi Hansson explores the perception that the system-building enterprise at the heart of botanical study was a masculine undertaking by drawing on the work of the late nineteenth- and early twentieth-century Irish writer, Emily Lawless (1845-1913). Lawless presented her botanical observations in the form of popular articles, short stories, fiction and, in particular, her work *A Garden Diary* (1901). While deliberately adopting an unscholarly mode of writing and deploying feminine modesty markers, her narratives at the same time contained scientific commentaries and articulated scientific knowledge. These apparent tensions in her work reflect her dissatisfaction with system-building in general – and the Linnaean system in particular – as well as a sense that such taxonomies failed to represent adequately the plants of Ireland. In Lawless's writing, just as in Ségur's translation, nationalist concerns surfaced as she argued that Linnaean taxonomy or British units of measurement were inappropriate ways of capturing Irish flora, both culturally and scientifically.

Together these articles chart the history and progress of women's botany, and what emerges is a complex and compelling account that documents their struggle to make public their botanical knowledge. Wakefield, Graham, and Lawless were unfairly treated by their contemporaries in one way or another as a result of their botanising and they were subject to anxieties around publishing and systemising. They often display a fraught relationship to the scientific because of this in their writing. Wakefield promoted botany as a female pursuit but she was anxious about publishing her *Introduction to Botany* and apologised in the preface for "obtruding" her work "upon the public" despite its educational intent (iii). Martin shows how her venture into print attracted the attention of Octave Ségur, who appropriated her text for his own ends, republishing it in French under the title *Flore des Jeunes Personnes* in 1801 without, it seems, making contact with her. Maria Graham is often referred to as merely a highly accomplished Englishwoman rather than as a botanist in her own right. She was valued as a correspondent and plant collector by Hooker who celebrated her achievements in his own botanical writings but her position as a colonial wife has allowed her to be dismissed as a mere hobbyist and dilettante by some, as Hagglund demonstrates in her article. Emily Lawless sadly had no concept of herself as a "women of science", giving authority to the observations of the gentlemanly "man of science" in her *Garden Diary* of 1901. Hansson describes below how she was subsequently patronised by a male "expert" on natural history who apologised for responding to the claims she had made in the periodical *Nature* because he did not wish to be discouraging to "a lady observer".

The reception of the work of these women botanists is addressed in all four articles, as are the tensions between women's botanical writing and the scientific, both inside and outside the text. This manifests itself in interesting ways when it comes to the promotion of Linnaean botany for women. Wakefield, for example, reverts to using the common names of plants confining their Linnaean Latin names to footnotes,

despite her knowledge of Linnaean systematic. She was mindful perhaps of those accusations of pedantry and precocity that sometimes accompanied women who used Latin or scientific names of plants in public and was protective towards her young women botanists.[9] Her preference for commonplace native plants and adoption of the anglicised non-threatening terms of Withering to describe the sexual parts of the flower is indicative of her patriotism, but it also points to a number of concerns around the representation of Linnaean botany for young women. Wakefield favoured indigenous botany; she embraced a universal system of naming plants but confined her study to the local flora of the nearby field or hedgerow, choosing examples from familiar British species to illustrate the Linnaean classes and orders in the tables. There are tensions here between the local and the universal, and the influence of Withering's anglicised version of Linnaeus is easily detected. As noted, Linnaeus is sidelined in Ségur's translation of Wakefield's text which promoted the French system of Tournefort. The anglicising and feminisation of botany that had begun with Withering is at an end here as Ségur also attempts to realign the text towards a male readership, as Alison E. Martin will show. Maria Graham was a disciple of Withering, one of the first to feminise Linnaean botany and present it "in an English dress" (George, *Botany, Sexuality and Women's Writing* 87), but she seemed not to be committed to any one system or nation in her own botanical activities. Graham broke out of the confines of the local, venturing beyond the hedgerow, collecting plants in Chile, India and Brazil in the nineteenth century and building a reputation as a plant collector and correspondent. She apparently saw no contradiction in using Linnaeus to catalogue native plants on her travels while employing the cultural concepts of her local informants. Elsewhere, she appears to turn her back on scientific botany, drawing on folklore, herbalism and superstition in *A Scripture Herbal* of 1842. These are areas which Linnaeus outlawed and Rousseau banished from botany, and it suggests perhaps that Graham is not a true Linnaean in the way that Wakefield was, despite the self-censorship the latter performed.[10] By the time Lawless was writing in the late nineteenth century, Linnaeus had fallen out of favour with female botanists; her work is crucial in demonstrating a more questioning relationship between women botanists and male systematisers. She expresses her dissatisfaction at the application of imported taxonomical models in Ireland and appeals to "botanic Celts" to develop an entirely new system of botany, one that is in sympathy with her own sense of Irishness. Hansson argues that Lawless reverts to Linnaeus because she recognises the need for a common language, and in this Lawless is not that far removed from Wakefield, who embraced Linnaeus to produce what is arguably the first work of scientific botany for women, as distinct from the herbals which were women's accustomed domain.

As well as revealing the contradictions and ambiguities that arise in these readings, this special issue of the *Journal of Literature and Science* on women and botany aims to give the works of these female botanists an emancipatory reading. Lawless, for example, was bold enough to challenge the conventions that saw flowers as feminine, re-fashioning them as masculine in 1899 just over a hundred years after Wakefield's familiar letters introduced young women to the study of botany. It is the radical and liberationist aspects of these texts, facilitated by the circulation of ideas through the processes of (international) transmission and exchange, that the following articles reveal in ways which, we hope, will encourage further scholarship in this field of enquiry.

Notes

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1. For an excellent study on Mary Delany's work in its social, aesthetic and scientific context, see Laird and Weisberg-Roberts.

2. For a closer discussion of these sexuality debates, see George, *Botany, Sexuality and Women's Writing.*

3. For a detailed discussion of Wollstonecraft and the notion of "luxuriants", see George, "The Cultivation of the Female Mind."

4. For the familiar format and women's botanical writing, see Shteir, *Cultivating Women*; George, *Botany, Sexuality and Women's Writing,* particularly chapters 1 and 2. Michèle Cohen has examined the familiar format in educational writing more broadly in "'A Proper Exercise for the Mind.'"

5. On women as foreign travellers, see Bohls and Ghose.

6. On translation and the circulation of (scientific) knowledge, see Secord.

7. For a detailed analysis of Howorth's translation of *Die Alpen*, see Martin, "Natural Effusions".

8. For an overview of women's contribution to botany through translation, and a close analysis of the Reid and Marcet translations, see Martin, "The Voice of Nature".

9. A bold display of botanical Latin which had enabled Linnaeus to universalise his science (which he could not have done in his native Swedish) was still considered to be at odds with femininity. Sam George discusses this in relation to botanical texts by Maria Jacson and Charlotte Smith (*Botany, Sexuality and Women's Writing* 89).

10. Sam George argues that Rousseau lionises Linnaeus for supplying the Ariadne thread in botany, a universal system which led botanists out of the labyrinth of local knowledge and instigated botany's departure from herbalism and superstition (*Botany, Sexuality and Women's Writing* 54-55).

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Epistolary Exchange: the Familiar Letter and the Female Botanist, 1760–1820

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An investigation into women's involvement with botany in the eighteenth century invariably leads to the culture of letters. The Duchess of Portland (1715-1785)[1] compiled notebooks on natural history, but it is her letters that allow us to uncover social networks and document the circulation of ideas involving botany and plant collecting. The Duchess's ten-year correspondence on botany with Jean-Jacques Rousseau (1712-78) is significant in illuminating the role of women in botanical culture. At this time, biological specimens were classified according to the taxonomic system of the Swedish naturalist, Carl Linnaeus (1707-78),[2] who himself exchanged letters on classification with a number of British women, notably the plant collector, Anna Blackburne (1726-93) (Wystrach 148-68). Consequently women were soon conversing in a new Linnaean language. It is no coincidence then that the two most widely-read introductions to Linnaean botany at this time were epistolary: Thomas Martyn's *Letters on the Elements of Botany Addressed to a Lady* (1785), translated from Rousseau, and Priscilla Wakefield's, *An Introduction to Botany; in a Series of Familiar Letters* (1796).[3] The rendering by Priscilla Wakefield (1751-1832) of Linnaeus in English rather than Latin meant that, for the first time, literate but unlearned young women gained access to botany through letters:

> Till of late years, [botany] has been confined to the circle of the learned, which may be attributed to those books that treated of it, being principally written in Latin: a difficulty that deterred many, particularly the female sex, from attempting to obtain the knowledge of a science, thus defended, as it were, from their approach. (*An Introduction to Botany* ii)

The readership for Linnaean texts in English fostered an audience that was inclusive of women and adaptations and translations of Linnaeus in English flourished, but this is not straightforward, since authors of scientific texts carefully modified their Linnaeanism for female readers as I will show. Botany books written by women in an informal "familiar format", such as Wakefield's *Introduction*, demonstrate that knowledge of botany at this time was feminised and polite (ii). Maria Jacson's *Botanical Dialogues* (1797) and Harriet Beaufort's *Dialogues on Botany* (1819) should perhaps be mentioned here alongside Sarah Mary and Elizabeth Fitton's *Conversations on Botany* (1817) and Jane Marcet's *Conversations on Vegetable Physiology* (1829). The familiar format embraced both dialogues and letters. The familiar letter in particular had a strong relationship to the conduct book or advice book, which had sprung from a long tradition of literature directed towards promoting ideal behaviour. Whilst I acknowledge the impact of this tradition on the development of botany books for young women, my emphasis will be on drawing out the emancipatory moments in science writing for girls, offering a textual reading which teases out the many ambiguities and contradictions involved in young women's access to botanical science in the eighteenth century.

Jean-Jacques Rousseau was instrumental in shaping the feminisation of botany in England at this time due in part to Thomas Martyn's translation of the *Lettres*

elementaires sur la botanique (1771-73), which had been for Madame Étienne Delessert, the owner of a famous herbarium and botanical library.[4] They offer guidance to a young mother over the instruction in botany of her daughter. Thomas Martyn, Professor of Botany at Cambridge, translated Rousseau's epistolary botany into English as *Letters on the Elements of Botany Addressed to a Lady* in 1785.[5] His work was inscribed on the title page, "To the Ladies of Great Britain No Less Eminent for Their Elegant and Useful Accomplishments Than Admired for the Beauty of Their Persons." Martyn openly courted female readers, capitalising on Rousseau's address to a young mother, creating a vogue for botany books written for a particular class of enlightened British women and promoting botany as an elegant pursuit for "Ladies".

British women were familiar with Rousseau the botanist[6] and this is borne out in their own botanical writing; he is rumoured, too, to have botanised in Derbyshire with the Duchess of Portland.[7] Charlotte Smith (1749-1801), whose *Rural Walks* (1795) and *Rambles Farther* (1796) are largely comprised of botanical dialogues, identified with the solitary botanising figure of *Reveries,* and Maria Jacson (1755-1829) cited Rousseau on the title page of her *Botanical Dialogues* (he was introduced in England to her cousin Sir Brooke Boothby, a member of The Botanical Society at Lichfield). Priscilla Wakefield's *Introduction to Botany* of 1796 comprised *A Series of Familiar Letters* between two sisters, Felicia and Constance. Wakefield recognisably modelled her own botanical letters on Rousseau's, showing again his profound influence on botanising women. Thus both texts explain the Linnaean system in a series of letters and centre on intimate exchanges of knowledge between two females. They also each feature a botanising tutor who superintends the letters. Both sets of letters take the reader, letter by letter, through each Linnaean order or class, emphasising the importance of classification. The familiar letter employed by Wakefield, Rousseau and Martyn (Martyn in fact appended some of his own letters to Rousseau's eight) was central to the dissemination of botany for young women.

Botany provided an epistolary space for an amusing interplay of Rousseauvian education and Linnaean classification. Wakefield appropriated the methodology of Linnaeus and the familiar format of Rousseau and adopted these to her own purposes in the letters.[8] The received image of Rousseau as a botanist is usually that of the solitary herboriser; however, the *Lettres* show a new kind of sociability in relation to botany through a dialogue between a tutor, mother, and daughter. Wakefield develops this dialogic sociable model into one that is exclusively feminine in her letters on botany, replacing Rousseau's male tutor with a female mentor, and positing a familial model comprising of a governess and two sisters. Felicia undertakes a direct observation of plants in the local fields and hedgerows, accompanied by her governess and imparts her new found knowledge at the end of each day in a letter to her absent sister Constance:

> My fondness for flowers has induced my mother to propose Botany, as she thinks it will be beneficial to my health, as well as agreeable, by exciting me to use more air and exercise than I should do, without such a motive; because books should not be depended upon alone, recourse must be had to the natural specimens growing in fields in and gardens; how should I enjoy this pursuit in your company, my dear sister! but as that is impossible at present, I will adopt the nearest substitute I can obtain, by communicating to you the result of every lesson. You may compare my descriptions with the flowers themselves,

> and by thus mutually pursuing the same object we may reciprocally improve each other. (2)

The sisters are to spend the summer apart as Constance has been sent away to stay with their aunt. Sisters who had become separated (usually by marriage) often enjoyed an elaborate daily correspondence that substituted for actual conversation (Cohen, "Familiar Conversation" 104). Epistolary fiction often works according to a similar formula whereby two or more people, separated by an obstruction, which can take a number of forms, are forced to maintain their relationship through letters (Perry 93-117). The familiar letter, fictional though not strongly narrative, inhabits a middle space between novels and real exchanges and relies on this motif of separation:

> The further I advance in my study, the more pleasure I take in it, and should value it as an important addition to the number of my innocent enjoyments, if partaken with you my dear Constance. Though far separated from each other, I am still desirous of associating with you, as much as the mode of communication will permit, in the delight I feel in examining pointals and stamens. (17)

Speaking of her governess, Felicia writes, "botany supplied us with subjects for conversation" (3); her epistolary exchanges with Constance develop out of these instructive conversations which substitute for formal lectures. The letters point to sociability, and reciprocity and yet the correspondence can be understood as being self-reflexive rather than genuinely dialogic, because all the letters are from Felicia to Constance (a one-sided exchange in the manner of a conduct book). This sense of didacticism is ambiguous, however, since Felicia acknowledges and responds to the letters she has received from her sister; though they do not appear in the volume, there is a sense of dialogue, as here:

> The appropriation you express, my dear Constance, of my endeavours to amuse you with an account of my botanical lectures, encourages me to proceed, though with great diffidence, as I find the subjects become more intricate as I advance. (10)

The familiar letters ensure that knowledge is imparted gradually, by degree, and the lessons are not undertaken out of a sense of duty: they are interesting and pleasant. They exemplify the Enlightenment transformation of Horace's ideal of instruction blended with amusement. In juvenile literature this ideal had developed out of the teachings of John Locke.[9] The Martyn/Rousseau letters also conform to this educational ideal and similarly focus on female learning; however, an element of eroticism can be detected in the botanical exchanges which is noticeably absent from Wakefield's Quakerly text. This potential eroticism in botanical texts for women becomes a source of added tension when bought into contact with the Linnaean sexual system, as we shall see.

In the first of the Martyn/Rousseau letters we learn that "maternal zeal" has driven a young woman to embark on a course in botany so that she may teach her daughter about plants. The tone is one of mutual improvement brought about by the intimate exchange of knowledge between a mother and daughter. The relationship between the mother and her male instructor is understated here but it is played out in a flirtatious botanical dialogue in the remaining letters. Rousseau was influenced by

popular science dialogues such as Fontenelle's *Entretiens sur la Pluralité des Mondes* (1686) where a cultured Parisian philosopher instructs the "most amiable creature in the universe", a Marchioness, in the mysteries of Cartesian astronomy (19).[10] Through Aphra Behn's English rendering of it in 1688, and other translations, it became a widely read and influential text for women.[11] Fontenelle unveils the secrets of astronomy to an enlightened "lady" and Rousseau similarly initiates a young woman in the "mysteries of vegetation":

> When you have examined this petal, draw it gently downwards, pinching it slightly by the keel, for fear of tearing away what it contains. I am certain you will be pleased with the mystery it reveals when the veil is removed. (36)

In Rousseau's Linnaean disclosure, botanical knowledge is made to seem illicit. The young woman is instructed to proceed with caution when it comes to her daughter and to "unveil to her by degrees no more than is suitable to her age and sex" (26). This hint of erotic pleasure is understandably missing from Wakefield's text. The open book of nature was both concealed from and unveiled to women in varying degrees during the eighteenth century; few, however, considered a study of sex life of plants to be quite so conducive to female character building as Rousseau. Botanical metaphor was crucial in debates around female botanising at this time and it is the sexual system of botany and its representation to which we now turn.

The authors of botanical texts wooed female readers, drawing on familiar analogies between women and flowers to celebrate the virtues of the 'British fair' in their prefatory material. Linguistic conventions were already in place whereby flowers were emblems of purity, beauty and fragility, the so-called female virtues, and whose ephemeral beauty was associated with the female body. Such floral imagery proliferated not only in poetry, essays and letters but had extended to philosophic and scientific writing (Edmund Burke comes to mind here).[12] That traditional pastoralism, looking nostalgically to some lost Eden, employed flowers as symbols of innocence; this was dramatically disturbed when the Swedish botanist and taxonomist, Carl Linnaeus, focussed on the flower in order to detail the sexuality of plants by offering precise descriptions of their organs of generation. In the *Systema Naturae* of 1735, Linnaeus abandoned previous formal systems of classification and founded the "sexual system." In this system, classes are distinguished by the number or proportion of male parts or stamens in each flower, whereas orders in many of the classes are distinguished by the number of female parts or pistils (Morton 263).

Linnaeus developed an anthropomorphic imagery for flowers which is borne out in English adaptations of his Latin works. James Lee's *Introduction to Botany* (1760) was the first work to present the sexual system to British readers: here "male" stamens are "husbands", "female" pistils "wives" and sexual union a "marriage". Meanwhile, flowers lacking stamens or anthers are termed "eunuchs". (Lee 79, 85, 88, 161). In another Linnaean text, Hugh Rose's *Elements of Botany* (1775), the union of stamens and pistils during fertilisation is likened to "husbands and wives on their nuptial bed [. . .] the *calyx* then is the marriage bed, the *corolla* the curtains, the filaments the spermatic vessels, the *antherae* the testicles, the dust the male sperm, the *stigma* the extremity of the female organ, the *style* the *vagina*, the *germen*, the ovary" (151). This boudoir version of botany unleashed onto the public imagination the idea that plant reproduction was analogous to human sexuality.[13]

The sexual system teems with marriage metaphors but Linnaeus had made explicit the indiscriminate sexuality of plant reproduction, devoid of modesty, with

little or no degree of selection over sexual unions. In this period the order of society was assumed to rest on the order of nature; controversies surrounding the sexual system in England intensified due to the number of women who were practising the modern system of botany. Charles Alston, former King's Botanist and Keeper of the Royal Garden, complained of obscene names being imposed by sexualists on the fructification of vegetables and branded Linnaeus, "too smutty for British ears," fuelling debates about whether women might be instructed in Linnaean botany without offending female delicacy (1:266).[14] In the 1790s, the reactionary poet, topographer and naturalist, the Reverend Richard Polwhele, was unable to comprehend how an examination of a plant's organs of generation could be conducive to female modesty and warned that botanising girls anatomising the sexual parts of the flower were indulging in acts of wanton titillation:

> With bliss botanic as their bosoms heave,
> Still pluck forbidden fruit with mother Eve,
> For puberty in sighing florets pant,
> Or point the prostitution of a plant;
> Dissect its organ of unhallow'd lust,
> And fondly gaze the titillating dust. (lines 29-34)

These sighing, panting girls are partaking in something akin to sexual experimentation: "I have several times seen boys and girls botanising together," exclaimed the outraged Polwhele, before confessing that he had at first written:

> More eager for illicit knowledge pant,
> With lustful boys anatomise a plant;
> The virtues of its dust prolific speak,
> Or point its pistil with unblushing cheek. (note to line 29; 8)

Polwhele characterises botanic exploration as an uneasy blend of science and voyeurism; the scrutinising gaze of the female botanist penetrates a microscopic world in order to expose the organs of generation. His text demonstrates the spread of Linnaean ideas in England and the anxieties surrounding the figure of the female botanist in the last decade of the eighteenth century.

One of the earliest proponents of women's botany, William Withering attempted to "fair sex" it:

> From an apprehension that Botany in an English dress would become a favourite amusement with the ladies, many of whom are very considerable proficients in the study, in spite of difficulty; it was thought proper to drop the sexual distinctions in the titles to the Classes and Orders. (1:v)

Withering omitted the sexual distinctions that defined Linnaeus's classes and orders, producing a decorous botany that young women could be exposed to with safety, whereas his arch rival and fellow member of the Lunar Society in Birmingham, Erasmus Darwin, specifically focused on the Linnaean sexual content to create a provocative poetic account of the sex life of plants. *The Loves of the Plants* (published in 1789) was to form part of the epic poem, *The Botanic Garden* in 1791. Darwin cast himself in the role of a flower painter displaying the "Beaux and Beauties" of the

vegetable world before the eyes of his female readers as if they were "diverse little pictures suspended over the chimney of a Lady's dressing-room, *connected only by a slight festoon of ribbons*" (vi). He restored the sexualised nomenclature which Withering had deliberately erased, initiating female readers into the secret world of "vegetable loves" and encouraging women to engage with their own sexuality through botany.

Darwin's libidinous work proved profoundly influential in exciting women's interest in botany and this in turn increased those sexual anxieties that were already surrounding the female botanist. In 1790, the philosopher and naturalist John Berkenhout wrote to his son:

> The lady who asked the question whether women may be instructed in the modern system of botany consistently with female delicacy? was accused of ridiculous prudery; nevertheless, if she had proposed the question to me, I should have answered—they cannot. (307)

Botany was suddenly at the forefront of debates on female education. Mary Wollstonecraft, opposed the threat by Berkenhout and his followers to limit women's access to botanical knowledge. She argued in *A Vindication of the Rights of Woman* (1792) that, contrary to Berkenhout's "gross idea of modesty," female reserve was "far from being incompatible with knowledge" (123). Fortunately, the "fair book" of botanical knowledge was not to be firmly "shut with an everlasting seal" as Wollstonecraft feared. Erasmus Darwin's *A Plan For The Conduct of Female Education in Boarding Schools* (1797) recommended a number of titles on botany, including the Martyn/Rousseau *Letters*, Maria Jacson's *Botanical Dialogues* (1797), Curtis's *Botanical Magazine*, and the Botanical Society at Lichfield's translations from Linnaeus. Yet this knowledge still had to be placed under constraints.

Women were encouraged to broaden their knowledge of plants in the schoolroom but gender-coded representations of botany often depicted it as a genteel amusement for "ladies" within a familial setting. Rousseau, for example, was concerned that his botanical "ladies" did not consider botany to be a "great undertaking": "You must not [. . .] give more importance to Botany than it really has; it is a study of pure curiosity" (71). As a rational, industrious study, botany was thought highly beneficial to female minds. Thus, Wakefield promoted botany as:

> a substitute for some of the trifling, and not to say pernicious objects, that too frequently occupy the leisure of young ladies of fashionable manners, and, by employing their faculties rationally, act as an antidote to levity and idleness. (iii)

Botany and no other natural science has thus been singled out to act as an antidote to 'feminine' faults such as idleness and frivolity. It is these traits, along with insubordination, which Rousseau warned are "most dangerous" and "very hard to cure once established" in girls.[15] He reassures the young mother who features in *Letters on the Elements of Botany* that botany can supply an alternative focus for these wayward urges. Wakefield and Rousseau's botanical texts are exemplary in that they indicate the ambivalence in the process of the feminisation of botany: whilst they are open to an emancipatory reading, offering women access to scientific knowledge for the first time, they also have a conservative function in that they can reaffirm conduct book constructions of femininity.

Conduct books and advice manuals were often published in letter form: Lord Chesterfield's *Letters to His Son* 1774 and Hester Chapone's *Letters on the Improvement of the Mind* are notable examples of this genre.[16] These texts advised on matters on education, appropriate recreation, and polite conversation. Whatever the format, the underlying goal of all conduct books was the formation of a good and virtuous person, or what was thought of as such. Epistolary novels which claimed to be educational, such as Samuel Richardson's *Clarissa* (1747) or Frances Burney's *Evelina* (1778), had a similar relationship to this literature. Burney's novel, for example, offers advice on a young lady's "entrance into the world," played out in the public arenas of pleasure gardens, theatre visits, and masquerades.[17] Evelina's adventures in London allowed Burney to explore the conventions governing young women's behaviour in public at a time when modesty governed comportment, demeanour, dress, and expression. Wakefield's fictional letters, in some degree, developed out of the narrative form of these advisory epistolary novels. Felicia's letters on botany, then, are often a vehicle for sisterly advice or religious guidance, but she never neglects to emphasise learning from experience and the pursuit of scientific knowledge:

> Before you dismiss the Mallow tribe, take your microscope and examine the dust of the anthers; it will afford you entertainment, being curiously toothed like the wheels of a watch. The most minute parts of nature are furnished with an elegant nicety, that surpasses the utmost efforts of art. The finger of the Divine Artist is visible in the most minute of his works; let us be excited to observe them with the greatest attention, they will not only supply us with present amusement and wonder, but will serve as a hidden treasure to alleviate the solitude and wearisomeness of old age. May a similarity of taste and sentiment continue to unite us in the same pursuits, to the end of our days. (122)

The emphasis on 'proper' feminine roles in botany books demonstrates that, while popular translations from Linnaeus led women out of the labyrinth of ignorance and local knowledge, they were still bound by the cords of propriety. The sisters are encouraged to derive knowledge from their own observations and "to confirm [their] knowledge by practice" (25) but they are never entirely alone. Felicia's botanising activities are always subject to the ever watchful eye of the governess and her letter writing in the evening in the drawing room is similarly scrutinised. Richardson's *Clarissa* had dramatised the often minute regulation of young women's letter writing; similarly, we learn from Felicia in *An Introduction to Botany* that the botanising governess "superintends my letters and points out what I should write," that she is "incapable of methodising accurately" without her assistance, for she "will not allow me to do anything without some degree of regularity" (29). Regulation can be authorised by natural history: Felicia is encouraged to observe the "beautiful regularity in most of nature's works" (32). This concern with regularity and order enables that familiar slide from the natural to the social, making botany ideal disciplines for women and children.[18]

Ambivalence towards independent learning is easily detected in the aversion to natural history as bookish theory in these texts. This has an important relationship to the sociability that is involved in epistolarity. Wakefield and Rousseau both reject book learning in natural history lessons for young women, though this is not clear-cut. They insist that book learning in itself is inadequate and substitute lessons in outdoor

exploration and direct observation. These methods, it can be argued, discouraged women from the solitary pursuit of scientific knowledge – though this, too, is ambiguous. Rousseau was famously antagonistic towards book learning: something of a contradiction given his role as an educationalist and writer.[19] Books, he argued, "lead us to neglect the book of the world," and book learning came into conflict with his idea of "an education according to nature" in *Emile* (1762) (414, 147). Given Rousseau's hostility to books, it comes as no surprise to find that his botanising ladies are encouraged to study botany in nature herself and not from the pages of a book. Wakefield's approach to the study of nature was informed by Dissenter notions of immediacy, utility, and fidelity to observed facts; it was, similarly, closely connected with that tradition of fieldwork in natural history which emphasised direct observation and visual perception: "Remember to use your eyes," wrote Wakefield, "and let none of nature's beauties escape your attention" (*An Introduction to Botany* 77). She implies that outdoor botanical activity is more beneficial to the female mind and body than book learning because "books should not be depended upon alone" (2).

Wakefield's Felicia does retire from company and indulge in some private botanising ("suppose me seated in our dressing room, with many specimens before me of the class *Tetradynamia*" [113]) but, somewhat subversively perhaps, can only do this because it is assumed that she is writing letters at her desk. Thus women were dissuaded from the solitary pursuit of scientific knowledge and from closeting themselves away with books and specimens. This can be seen as a way of diverting women away from masculine knowledge, embodied in books and learned languages; at the same time, however, Enlightenment modernists tended to see the way forward for science as being precisely this turning away from books towards experience. Thus Bacon had argued against the appeal to canonised texts such as those of Aristotle, proposing a new, inductive science; Newton had applied this method with spectacular success in his experimental science in the fields of optics and mechanics; Locke had provided Newton with an empiricist underpinning that again stressed the derivation of knowledge from experience rather than written authority. Hence, to encourage women to actively derive botanical knowledge from observation and experience was, in some way, to invite them to participate in the whole modernist project of experimental science.

The familiar letter could similarly act to discourage the solitary pursuit of scientific knowledge. The letter by its very nature was both public and private, but the familiar letter in its published form promoted shared experience, sociability rather than solitariness. Epistolary correspondence and conversation were regarded as "kindred subjects" in conduct books and women were often advised to transcribe actual conversations on interesting subjects in letters.[20] Read aloud, botanical letters could substitute for conversation, and conversation in turn could be seen as a means of safeguarding against female learnedness or pedantry, because it took precedence over solitary pursuits (reading in private for example) and could act as an antidote to the type of introspection and self-musing that conduct books tended to discourage in girls.[21] Conversely, conversation of this kind was educational and instructive too since it ensured that one's botanical opinions were open to contradiction and refutation once they were made public.

I now want to develop my exploration of the ambivalence in the process of the feminisation of botany by analysing the use of Linnaean methodology in these texts. Wakefield takes the reader through each Linnaean class in turn, paying great attention to taxonomy. Rousseau's letters expound what he believed to be the 'true' study of botany in a similarly methodical manner. There is an – understandable –

misconception that Rousseau, who in the "Discourse on the Sciences and Arts" famously linked the advancement of the arts and sciences to the spread of luxury and the corruption of morals, was antipathetic to the scientific frame of mind.[22] In fact, Rousseau was driven to study plants systematically in spite of his hostility to academic science. He had begun notes towards a dictionary of botanical terms in the year 1764 which was eventually abandoned; however, from it remained a history of the "rise and progress of botany" which celebrated Linnaeus's contribution to the advancement of the science. Martyn's translation of this essay formed the introduction to the *Letters*, when the work appeared in English in 1785. What is striking about Rousseau's essay is that, contrary to the expectations we have noted, it shows a typical Enlightenment concern with methodology and systematic thought:

> Distant voyages were incessantly enriching Botany with new treasures; and, whilst the old names already overloaded the memory, it was necessary to invent new ones incessantly for the new plants that were discovered. Lost in this immense labyrinth, the botanists were obliged to seek a thread to extricate themselves from it; they attached themselves therefore at last seriously to method. (9)

Rousseau lionises Linnaeus for supplying the Ariadne 'thread' in botany, a universal system which led botanists out of the labyrinth of local knowledge and instigated botany's departure from herbalism and superstition – a break with apothecaries, herbalists, infusions and poultices.[23] According to Rousseau, Linnaeus's simple binomial nomenclature had created a new language for botany "which is as convenient and necessary for botanists, as that of algebra is for mathematicians" (12).

Wakefield was also indebted to Linnaeus, "the great master of method and arrangement" (44), for making the acquisition of botanical knowledge easier for the novice. She urged her readers to embrace Linnaean systematics, "for it is by method only that it is possible to obtain a knowledge of so many particulars" (26), and endeavoured to explain the importance of the new system of botany. Martyn, however, feared that the introduction of method would lose him the attention of his female readers and made the following plea:

> Do not suffer yourself to be terrified at the word *System.* I promise you there shall be little difficulty in it to you who have patience and attention and as little parade of hard words as possible, only allowing me to name my classes and orders. (86) (Martyn's emphasis)

Passages such as this point to one way in which women as consumers of science were perceived; here, in a somewhat patronising way.

However, the authors of these introductory, but systematic, texts encouraged radically different levels of engagement for their female readers: from gentle exercise and plant collecting in Rousseau, to empirical science, dissection and microscopy in Wakefield, who urged: "confirm your knowledge by practice and do not suffer a day to pass without amusing yourself in dissecting some flower or other" (25), and "apply your microscope, and you will be pleased with the beauty and variety discernible in this little-regarded flower" (136). However, despite these different emphases, both Rousseau and Wakefield's texts gave botany a familial setting and discouraged much beyond simple classification and plant collecting. Wakefield introduced the female reader to scientific classification but avoided using scientific terms in the body of the

text, substituting common names such as 'Lungwort,' 'Houndstongue,' 'Goosefoot,' and 'Henbane,' where possible, and placing botanical nomenclature, *Pulmonaria*, *Cynoglossum*, *Chenopodium*, *Hyoscyamus*, in footnotes.

Whilst she was committed to the cultivation of female minds and the development of female reason, she delimits this with many gender and class-specific boundaries. [24] This order and regulation could be authorised by botany. For Rousseau, too, as Martyn emphasises, botany was a means by which women could become acquainted with – and implicitly, socialised into – an ordered system: "you must go forth into the garden or fields, and there become familiar with that beauty, order, regularity and inexhaustible variety which is to be found in the structure of vegetables" (ix). Botany, then, could be used for disciplinary purposes, encouraging women (who were imagined to lack discipline) to engage with order and regularity.

Observation of the natural world, it was suggested, is a source of self-regulation for the unlearned – notably, women excluded from formal education, but also the labouring classes.[25] Martyn's "Ladies of Great Britain" are encouraged to learn from the direct experience of plants in the nearby field or garden rather than from the pages of a book:

> I beg leave to protect against these letters being read in the easy chair at home; they can be of no use but to such as have a plant in their hand; nor do they pretend to anything more, than to initiate such as, from their ignorance of the learned languages, are unable to profit by the works of the learned, in the first principals of vegetable nature. (x)

However, despite being enticed out of studious isolation into the fields and gardens, these women were not expected to 'parade' their scientific knowledge in public; we can now see the feminisation of botany in relation to the gendered dichotomy of the public and private spheres. Sarah Fitton sought to legitimise botany's suitability as a scientific pursuit for women by announcing in the preface to her *Conversations on Botany* (1817) that "botany is not a science of parade" (viii-ix).[26] Propriety dictated that women should use their botanical knowledge with discretion, to guard against provocatively parading any knowledge of Latin, or scientific terms, in public. Rousseau endorsed Linnaeus's binomial system of assigning universal Latin names to species yet he obviously felt that women were not an appropriate audience for such language:

> Nothing is more pedantic or ridiculous, when a woman, or one of those men who resemble women, are asking you the name of an herb or a flower in a garden, than to be under the necessity of answering by a long file of Latin words that have the appearance of a magical incantation; an inconvenience sufficient to deter such frivolous persons from a charming study offered with so pedantic an apparatus. (13)

A female audience, it seemed, called for a more familiar, domestic approach to scientific study. Rousseau advocated that botany remain in the feminine domestic sphere, shielded from the vanity of authors and professors; when self-interest comes into play, Rousseau argues, "the woods become for us merely a public stage where we seek applause" (*Reveries* 116). He sought to protect botany from the taint of ambition, and yet it was botany which gave women such as Wakefield entry into professional writing. In publishing and allowing her name to appear on the title page instead of the

obligatory "by a Lady," Wakefield paraded her botanical knowledge on the "public stage." Sensitive to accusations of immodesty, she apologised in her preface for "obtruding" her work "upon the public" despite its moralising intentions (iii).

Despite these limitations and contradictions, Wakefield's and Rousseau's botanical letters were unique in giving women access to botanical knowledge for the first time. They demonstrate sociability and the desire for self-education, declare the advantages of the new language of botany, and advance the new empiricist science. What is more, they epitomise Enlightenment botany, moving away from the particularised knowledge of the old herbals and embracing the universal systematising of Linnaeus. Botany, here, is dialogic and exploratory; the medium of familiar conversation lures women into deriving botanical knowledge from their own observations, allowing them to participate in experimental science. I have argued that epistolary texts in particular demonstrate ambivalence in the process of the feminisation of botany, but they are not simply didactically disciplinary works; they offer young women access to the scientific exploration of plants for the first time and are open to an emancipatory reading.

Thus the familiar letter facilitated the dissemination of botanical knowledge in spite of its moralistic associations with advice or conduct books. This exchange of ideas occurred via a host of dialogic activities: conversation, social networks, letter writing, publication and translation, and further responses to printed texts. Botany was tightly enmeshed with the voyages of discovery, yet women's botanical study was largely confined to the drawing-room, garden, and hedgerow. As a private activity, shielded from the corruptions of public life, botany mirrored the confinement of the feminine domestic sphere and yet, adapting Linnaeus and his followers, these female botanists contributed to the circulation of botanical ideas. Yet still the principal impulse behind this was the Anglicisation of the Linnaean system, but this, in turn, conjured up its own attendant anxieties. Barred from academies, universities and learned societies, British women entered into aesthetic, philosophical, and scientific debate, by way of botany and the familiar letter.

Notes

1. Lady Margaret Cavendish Bentinck, the Duchess of Portland (1715-1785), kept a menagerie and botanical garden in the grounds of her house at Bulstrode. She employed naturalists such as James Bolton and the Reverend John Lightfoot, founding member of the Linnaean Society in London, to arrange and document her natural history collection, the largest in Britain. For a brief account of the Duchess's involvement with natural history, see Allen (*Naturalist in Britain* 29-30). For the Duchess and botany, see George (*Botany, Sexuality and Women's Writing* 5, 9) and Cook (142-56).

2. Carl Von Linné (1707-78). Linnaeus's principal works include *Systema naturae* (1735), *Species plantarum* (1753), and *Genera plantarum* (1754). Examples of early British adaptations of his botanical works are James Lee's *Introduction to Botany* (1760), and Hugh Rose's *Elements of Botany* (1775), loose translations of Linnaeus's *Philosophica botanica* (1751). The Lichfield Botanical Society, headed by Erasmus Darwin, was instrumental in further promoting Linnaeus in Britain, producing their own more accurate translations from Linnaeus which were published as *A System of Vegetables* (1783) and *The Families of Plants* (1787). I have written on the significance of these English translations and British women writers' engagement with Linnaean botany in *Botany, Sexuality and Women's Writing*.

3. The Martyn/Rousseau *Letters* were read extensively and reprinted eight times over the next thirty years. Wakefield's *Introduction* went through eleven editions and was last reprinted in 1841. It was also translated into French in 1801.

4. Madame Delessert (1747-1816) had written to Rousseau throughout his wanderings and in 1771 asked for his help in introducing her daughter, Marguerite-Madeleine, to botany (McMullen 15-18; Wokler 110-14). Alexandra's Cook's notes to the letters are also very informative (Rousseau *Botanical Writings* 8: 130-172, 8:309-314).

5. Thomas Martyn (1735–1825) succeeded his father, John, to the Chair of Botany in Cambridge in 1762. He gave a course of public lectures introducing the Linnaean sexual system to the British public in 1763. He was elected a fellow of the Royal Society in 1786. For Martyn's published works, see Henrey (2: 54-57).

6. I elaborate on Rousseau's involvement with British women botanists in *Botany, Sexuality and Women's Writing* (5-6). Scholarship on Martyn's translation of Rousseau's botanical letters is limited, however. Marc Olivier has written about them briefly (161-9). I explore them more fully in "Cultivating the Botanical Woman" (3-11), and in *Botany, Sexuality and Women's Writing* (43-80). I should mention that there are two modern editions of the letters: Ernest J. Bonnet and Bernard Gagnebin's *Lettres sur la botanique* (1962), and Bernard Gagnebin and Marcel Raymond's *Lettres sur la botanique et Fragments pour un dictionnaire de botanique* (1969). As for recent translations into English, there is Kate Ottevanger's *Pure Curiosity: Botanical Letters and Notes Towards a Dictionary of Botanical Terms* (1979); and Alexandra Cook has translated the *Letters* and added scholarly notes and other correspondence: *Botanical Writings*. *The Collected Writings of Rousseau*, 8: 130-172 (2000).

7. For a detailed study of their relationship, see Cook "Botanical Exchanges"; brief references to their meeting appear in Edmunds and Eidinow (287).

8. The Linnaean letter, popularised by Wakefield, continued to thrive as a sub-genre of women's writing into the nineteenth century with texts such as Sarah

Waring's *A Sketch of the Life of Linnaeus in a Series of Familiar Letters Designed for Young Persons* appearing in 1827.

9. In *Some Thoughts Concerning Education*, Locke recommends books such as Aesop's *Fables* "which being stories apt to delight and entertain a child, may yet afford useful reflections to a grown man" (116-17). John Newbery, the first large-scale publisher of children's books in Britain, set about commissioning books which conformed to this Lockeian ideal of pleasurable instruction.

10. The "worlds of Fontenelle" was one of the few books that Rousseau carried into his father's workshop and read to him everyday during his work (Rousseau, *Confessions* 5: 8). For the influence of Fontenelle and the familiar way of dialogue in the scientific education of women, see Myer.

11. Behn's *A Discovery of New Worlds* appeared in 1688 just two years after the French original.

12. For an example of Burke's floral metaphors, see *A Philosophical Enquiry* (105-6). I discuss these analogies in relation to botany in *Botany, Sexuality and Women's Writing* (29).

13. A number of critics, notably Philip Ritterbush, François Delaporte, Londa Schiebinger, Janet Browne, Tim Fulford, and Alan Bewell, have explored botany and sexual politics in the late eighteenth century. I have engaged with these debates and taken them further in my book: *Botany, Sexuality and Women's Writing*.

14. Charles Alston (1685-1760) succeeded George Preston as Professor of Botany at the University of Edinburgh in 1738. Alston had studied under botanist/physician Hermann Boerhaave at the University of Leyden and favoured Tournefort's non-sexual system of classification.

15. "Idleness and insubordination are two very dangerous faults, and very hard to cure once established. Girls should be attentive and industrious, but this is not enough in itself; they should early be accustomed to restraint. [. . .] Their childish faults, unchecked and unheeded, may easily lead to dissipation, frivolity and inconstancy. To guard against this, teach them above all things self-control" (*Emile* 332).

16. See Morris. For the letter's relationship to the conduct book, see Myers.

17. Vivien Jones's introduction and notes to this edition are insightful and useful in showing how the novel can function as a conduct book.

18. Such as the age-old use of the social system of the bee to justify monarchy and a hierarchical class structure (ironically, the queen bee was for a long time thought to be male and this was used to justify patriarchy in addition). Terry Eagleton succinctly discusses the problems of naturalism, where "there can be a direct inference from fact to value, or from nature to culture" (103), in his chapter, "Culture and Nature (87-109).

19. In *Emile*, Rousseau asserts that "when I thus get rid of children's lessons, I get rid of the chief cause of their sorrows, namely their books" and boasts that "Emile, at twelve years old, will hardly know what a book is" (*Emile* 80). However, he does allow Emile to read *Robinson Crusoe* because it is the one book which "supplies the best treatise on an education according to nature" (147). Sophy, when she is older, is offered *Telemachus* and selections from *The Spectator*, though she is advised to "study the duties of good wives in it" (413). The sections on Sophy in *Emile* allow us to see that Rousseau is clearly repulsed by the idea of a "learned lady": "a female wit is a scourge to her husband [. . .] from the lofty height of her genius she scorns every womanly duty, and she is always trying to make a man of herself after the fashion of

Mlle. L'Enclos" (371). For his own part, he states, "I hate books; they only teach us to talk about things we know nothing about" (147).

20. Michèle Cohen elaborates on this idea using examples from Hester Chapone ("Familiar Conversation" 103).

21. "The girl who 'always muses by herself is apt to contract a sullen, sulky and supercilious air', while engaging in conversation ensures one hears one's own opinions contradicted and refuted" (Charles Allen, qtd. in Cohen ["Familiar Conversation" 106]).

22. Ann Shteir states that Rousseau had been "antipathetic to systemising and to any focus on names of plants" (*Cultivating Women* 20).

23. Botany, explains Rousseau, in his *Reveries of the Solitary Walker*, involves "pure and disinterested contemplation' and could not be further removed from medicine and anatomy, from 'stinking corpses, livid running flesh, blood, repellent intestines, horrible skeletons, pestilential vapours" (114).

24. In *Reflections on the Present Condition of the Female Sex*, she warns against women moving into masculine spheres and straying too far outside the domestic home. She also advocates that a woman should be educated according to her social position in society (67). In a similar way she derives social implications from the Linnaean hierarchy of classes and orders (*Introduction to Botany* 162).

25. Thomas Martyn, addressing his audience of "fair countrywomen and unlearned countrymen," claims that a reading of the Letters will save the "unlearned" student of botany from becoming "bewildered in an inextricable labyrinth of unintelligent terms," as he imagines might have happened if they had gone straight to the works of Linnaeus (viii).

26. Much of Fitton's work is derivative and this description of the virtues of botany is taken directly from Maria Edgeworth's *Letters For Literary Ladies*. Edgeworth is, in fact, discussing chemistry in these terms (21).

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Revolutions in Botany: Nation, Gender and Education in the French Translation of Priscilla Wakefield's *Introduction to Botany* (1796)

Alison E. Martin

In 1801 a new botanical work appeared on French booksellers' shelves. Entitled the *Flore des jeunes personnes* (*Flora for Young People*), it swelled the ranks of both popular and more academic texts on the science of botany that were appearing in ever swifter succession on the francophone book markets towards the end of the eighteenth century.[1] But the *Flore des jeunes personnes* was no home-grown product. Rather, it was a translation by Octave Ségur (1778-1818) of the immensely popular *Introduction to Botany* (1796) by the British Quaker writer Priscilla Wakefield (1750-1832). Ségur's French rendering of Wakefield's work, like the original, set out in twenty-eight letters the guiding principles behind Linnaean botany, with eleven engraved plates at the back illustrating the twenty-four classes underpinning this system. Its appearance did not go unnoticed by the French critical press, and it was reviewed to some acclaim both in obviously scientific and more literary journals. The *Journal Général de la Littérature de France* (*General Gazette of Literature in France*) even bestowed on it the dubious accolade of being accessible to "the simplest of minds," given its relative brevity and avoidance of complex scientific terminology (Rev. of *Flore des jeunes personnes* 164). A year later the *Flore* had gone into a second edition and a third appeared in 1810.[2] Ségur's translation of Wakefield's work was not only taken up in French literary and scientific journals. It was also mentioned by the Genevan botanist Auguste de Candolle in the bibliographical supplement to his *Regni vegetabilis systema naturale* (1818-21).

But the popularity shared by the English and French editions of Wakefield's *Introduction to Botany* belies the fact that they were rather different works. While the *Flore des jeunes personnes* retained Wakefield's characteristic epistolary format, Ségur exploited the creative possibilities afforded by the activity of translation to reposition her text politically, scientifically and also with regard to gender. Moreover Ségur's translation was highly self-referential from the very outset, with the inclusion of a translator's preface and paratextual information in footnotes that ostentatiously demonstrated that we were reading a translation and that the French text was very much the product of his pen. Far from being an 'invisible' translator, he explicitly made his presence felt in the text in ways which, I would suggest, caused *his* voice to resound throughout the translation.[3] Indeed, what I want to argue here is that the French translation was no longer solely Wakefield's text, and by offering a closer analysis of Ségur's *Flore des jeunes personnes,* I will examine how his translation subtly differed from Wakefield's original. Recent research in translation studies into the notion of 'voice' in translation has explored how the activity of translation can be considered a complex form of quotation, a re-enunciation of the source text and re-animation of it in ways that can be neutral but can also be interpretative, critical or dissociative (Hermans). I begin here by considering the translation as a virtual meeting point of two very different minds, Wakefield and Ségur being, as we shall see, from cultural and social backgrounds diametrically opposed – in itself a reflection of the range of people generating botanical writing in this period. Through a microtextual analysis of source and target text I then explore in turn the political,

gendered and scientific repositioning that characterises Ségur's translation of Wakefield's text, in order to understand how Ségur appropriated her work for his own ends.

Priscilla Wakefield, best known as a writer of improving and didactic works of non-fiction for children, produced seventeen books during her lifetime, principally moral tales, introductory works to natural history and fictional travelogues. Her career began in the 1790s when she was already over forty and her husband's business was beginning to founder. Financial need and legal costs arising from the unhappy marital circumstances of her sons compelled her to write for most of her remaining years, her last three works being penned by an amanuensis ("Mrs Priscilla Wakefield" 64). Writing was for her a way of making money, as much as it was a form of creativity. It also offered her brief respite and escape from some of the burdens of bringing up her numerous children and grandchildren, running the household and doing charity work to alleviate the plight of the poor. As she reflected in 1810, following the publication of her fictional travel work *Travels in Africa*, "The employment of writing is profitable, not only with a view to what it yields, but also as an amusement, affording considerable relief from the cares of life" (Mews MSS 284/1/21 106). Wakefield was not only a productive writer. She was also a voracious reader, as witnessed by her literary journals and diary. In 1807, for example, she worked her way through Jane Marcet's *Conversations on Chemistry* (1806) and Schiller's *Thirty Years War* (1800): other notes also refer to the Koran and Alexander von Humboldt's experiments on animal galvinism (which she presumably read in the 1799 French translation) (Mews MSS 284/1/1; 284/1/5). Wakefield could also speak French and translated from French and Latin. Intellectual curiosity encouraged her to start learning Italian in 1812 when she had turned 61, "a useless attempt at my age," she modestly noted (Mews MSS 284/2/19 16). Wakefield was therefore very much representative of the enlightened intellectualism that characterised a number of other Dissenting families such as the Wedgewoods, the Darwins and the Martineaus who supported women in making Enlightenment science accessible and inclusive (Hilton 110; Uglow 312-14).

The fact that Wakefield herself was a translator and had a reading knowledge of French immediately begs the question of how she responded to Ségur's translation of her work. What remains of her familial correspondence and private journals diaries is at best rather fragmentary: I have found no evidence of letters between Ségur and herself on the translation and also no comments elsewhere that indicate Wakefield's awareness of the existence of Ségur's *Flore des jeunes personnes* or of its wider reception in France. If Ségur did indeed produce the *Flore* without contacting Wakefield before, during or after completing his translation, that in itself is a telling indication of how little collaboration he sought with Wakefield, how readily he was prepared to appropriate her scholarship, and how intellectually 'unsociable' the male treatment of female scientific learning could be.

This stands in contrast to Wakefield's own approach to the circulation of scientific knowledge. A common theme running through her writing is the sociability of learning. Her frequent recourse to the epistolary format that characterised the *Introduction to Botany* or to educational conversation found in other works reflects her commitment to a mode of learning that centred on knowledge acquisition through observation, discussion and exchange. Her *Mental Improvement, or, The Beauties and Wonders of Nature and Art* (1794-97) was constructed around conversations between children and their parents that covered a diverse range of subjects, from whales to wool manufacture, sugar to slavery. *Domestic Recreation, or Dialogues Illustrative of Natural and Scientific Subjects* (1805) similarly features a conversation between

mother and daughter on topics covering rainbows, sea anemones and the workings of the human eye. All of these books were heavily underpinned by the notion that the workings of God were made manifest in the visible natural world, and that moral education and scientific observation were not at odds with each other at all, but rather complemented each other productively.[4] The *Introduction to Botany* was followed almost twenty years later by another natural history written along the same lines, the *Introduction to the Natural History and Classification of Insects* (1816), which drew on the figure of Felicia (familiar to us from the *Introduction to Botany*), who again corresponded from "The Shrubbery" to Constance, instructing her in butterflies, beetles, moths and suchlike. Here too learning and companionship went hand in hand, for as Felicia commented: "What is a walk, without a companion? or a book, unless there is a friend to converse with on its contents?" (*An Introduction to the Natural History and Classification of Insects* 1).

Wakefield's introductory scientific work was 'revolutionary' to the extent that it directly appealed to a female audience, it considered women capable of understanding Linnaean botany and it set about teaching them its principles in some detail. Indeed, Wakefield's *Introduction to Botany* was considered one of the most important works to disseminate Linnaean botany to a chiefly female audience. The *Monthly Review*, in a 1796 critique of Wakefield's *Introduction*, succinctly described the difficulties bound up with producing any elementary work on botany which engaged meaningfully with the complexities of the Linnaean system:

> The knowledge of Natural History in its various branches has deservedly become an object of attention in general education [. . .] but the subject is of immense extent; and, unless it be followed as it were professionally, there will always be a difficulty in determining *how much* of it should be taken. The Linnean system, especially, is founded on such minute particulars, that it is scarcely possible to enter on it with advantage in parts; and all attempts to render it easy and familiar must speedily terminate either in a resolution to encounter it as a serious task in its full extent, or in a hopeless dereliction of the ground already gained. (Rev. of *An Introduction to Botany* 348 [original emphasis]).

In her *Introduction to Botany* Wakefield had successfully circumvented most of these problems, the *Monthly Review* observed, by neither overwhelming readers with a flood of fact nor oversimplifying Linnaean botanical theory:

> Many attempts [. . .] have been made to familiarise this system [. . .]; and that before us is a respectable one. In the form of letters from a young lady to her sister, it goes through all the Linnean classes and orders of vegetables, with such explanations and instances as are best calculated to aid the comprehension; and with occasional relations of particular facts, useful or amusing. The language is pure and perspicuous [. . .]. (348)

Moreover, the *Monthly Review* continued, when studied in parallel with "the actual exhibition of specimens" out in the gardens, lanes and fields, Wakefield's work made a valuable contribution to the pursuit of scientific botany. This, in essence, was the great achievement of Wakefield's *Introduction to Botany*: to condense the complexities of the Linnaean system into a work accessible by young women and their charges, while neatly sidestepping accusations of impropriety, by encouraging

women to classify plants but not think about them as changing, reproducing entities. The *Lady's Monthly Museum* was unstinting in its praise of Wakefield's "enchanting study of vegetable nature" and even accorded it a place in a pantheon of late eighteenth-century botanical literature alongside Martyn's *Letters on Botany*, William Withering's *A Botanical Arrangement of British Plants* (1787-92), James Sowerby's *English Botany* (1790) and William Mavor's *The Lady's and Gentleman's Botanical Pocket Book* (1800) ("The Old Woman's Botanical Library" 148). Some twenty years after the first publication of Wakefield's *Introduction to Botany*, the *Gentleman's Magazine* was still recommending it as a work that would valuably supplement the Welsh botanist Reverend William Bingley's *Practical Introduction to Botany* (1817) (Rev. of *A Practical Introduction to Botany* 54).

But her writings on women – notably her lengthy discursive essay *Reflections on the Present Condition of the Female Sex* (1798) – do not radically rethink women's role in society in general and in (scientific) education in particular. Rather, Wakefield was concerned to give women greater access to knowledge and to increase the scope of their learning. "The intellectual faculties of the female mind have too long been confined by narrow and ill-directed modes of education," she declared, considering this "a neglect of the mental powers which women really possess, but know not how to exercise" (52). Wakefield thus saw women hindered not by their intellectual shortcomings but by social constraints and a lack of challenging educational and occupational opportunities for their sex. Her understanding of women's education was practically all-inclusive: "Nature has imposed no invincible barrier to their acquisition and communication of languages, arithmetic, writing, drawing, geography, or any science which is proper for girls to learn" (52). Education remained, however, a phenomenon which Wakefield continued to connect not so much with intellectual self-improvement as with the acquisition of knowledge that could then be imparted to others. "There are many branches of science [. . .], in which women may employ their time and their talents, beneficially to themselves and to the community," Wakefield noted, "without destroying the peculiar characteristic of their sex, or exceeding the most exact limits of modesty and decorum" (8-9).

Octave Ségur, almost thirty years younger than Wakefield, was the son of the aristocrat Count Louis-Philippe de Ségur who was a diplomat and military man, but also a poet. Octave studied natural sciences at the École polytechnique in Paris and by the age of twenty-two had gained a position in civil administration, which he subsequently gave up to join the army. The year in which Ségur published his translation of Wakefield's *Introduction to Botany* marks the beginning of the decade in which other works authored and translated by him appeared. Shortly after the publication of *Flore des jeunes personnes*, he wrote a popular work on chemistry, the *Lettres élémentaires sur la chimie* (*Elementary Letters on Chemistry*) (1803), which undoubtedly modelled its title on Rousseau's botanical letters and drew its inspiration from translating Wakefield. Ségur also clearly inherited his father's interest in literature, producing a French edition of T. J. Horsley Curties's Gothic historical piece *Ethelwina* (1807).[5] But in the years that followed, domestic troubles plagued Ségur's life and severely affected his mental health, such that in 1815 he threw himself into the Seine and drowned (Michaud 82: 64-65).

The preface to Ségur's translation of *Ethelwina* is instructive in understanding his own motivations for writing, translating and publishing. Ségur's decision to translate *Ethelwina* might seem strange, given his strongly scientific background. But the vogue for reading and translating English novels in France at this time made it a potentially successful translation project. Ségur's preface betrays a nervousness at

translating such obviously 'frivolous' literature which pandered to common taste, but it also stresses his conviction that it had an important role to play in an age in which the onward march of reason had stamped out any sparks of imaginative creativity (1: i). There were also moral (and implicitly political) justifications for choosing this work. Set in the age of Edward III, Ségur argues that *Ethelwina* derived its authenticity from the fact that it did not represent the "fickleness, religious neglect, impiety even, that characterise the Europeans of the eighteenth century" (v).[6] The past therefore offered him refuge from the realities of the post-revolutionary French political and cultural worlds. Where for Wakefield, then, the end of the Enlightenment had brought progress, greater access to knowledge and (limited) empowerment for women, for the newly reinvented 'citoyen Ségur' it signified the destruction of the old order and the descent into a modern age of artifice and irreligiosity, both of which awakened in him a palpable nostalgia for a pre-revolutionary France.[7]

The *Lettres élémentaires sur la chimie* cast Ségur in quite a different light. The preface forcefully conveys Ségur's confidence of his own position as an educated figure within a French national tradition of chemical research: the names of eminent French chemists – Antoine Lavoisier, Jean Antoine Chaptal and Antoine François, comte de Fourcroy – pepper the introductory pages. Aimed at a readership "of all ages and of both sexes" (like Wakefield's work before it), Ségur's *Lettres élémentaires* claims to enable readers to better understand the natural world and open up new paths of enquiry to them (vi). But the basic organisational device of epistolarity which it shares with Rousseau's and Wakefield's introductory botanical works operates rather differently. Ségur structures his introductory work on chemistry as a correspondence between two men "Octave" and "Auguste" in the opening letter, thus automatically sidelining his female readers (an interesting decision given that chemistry at the turn of the century was still very much a scientific domain accessible by women, as works such as Jane Marcet's *Conversations on Chemistry* (1806) demonstrate). This half-dialogue between these two male friends promptly shifts in the second and following letters to the more generalised "Octave à ses amis" ("Octave to his friends") (2). The individual, intimate nature of the exchange which Rousseau and Wakefield had rhetorically constructed is therefore weakened in Ségur's text as it becomes more of a lecture by the narrator to a general group of readers. It is surely also no coincidence that Ségur names his narrator-instructor after himself. While Wakefield must have projected herself into the role of "Felicia" as she composed her *Introduction to Botany*, the link between herself and the narrator is only implicit; Ségur's *Lettres élémentaires sur la chimie* makes this much more explicit in a work where the narrator is concerned less to educate by expository description and encourage 'sociable' learning than by direct instruction. Nor does Ségur shy away from using chemical terminology – was the term "oxygen" any more technical or stylistically barbarous than "syllogism," he enquired? – and he has no qualms about liberally employing a footnote apparatus that reinforces the text's more scholarly, rather than "introductory" nature (x).

Wakefield and Ségur therefore embodied radically different approaches to the dynamics of the age, to the goals of popular science and to the aims of authorship. How were these to be reconciled in translation? The translator's six-page preface with which the *Flore des jeunes personnes* opens – and which, through its larger font size dwarfs the three-page translation of Wakefield's own preface – offers us a useful starting point. Where Wakefield sets out brightly and firmly the aims of the *Introduction to Botany*, namely "to cultivate a taste in young persons for the study of nature" (v), Ségur begins his translation by reflecting that while man's achievements

are sometimes admirable, their price in gold, toil and blood is extortionately high and history has always proven them short-lived (1). Ségur's lament on the shortcomings of human civilisation gaines momentum as his narrative of decline accelerates into a violent sequence of destructive, annihilatory images:

> Les Palais les plus magnifiques des Rois les plus puissans, s'anéantissent ainsi que leurs Maîtres; les Temples s'écroulent, les Superstitions qui les avoient fondés s'oublient; les Cités se dépeuplent et se changent en ruines; les Empires même disparoissent; tout ce que produisent les Mortels est mortel comme eux (1)
> The most magnificent palaces of the most powerful kings are destroyed like their masters; the temples collapse, the superstitions on which they were founded are forgotten; the cities empty of people and fall into ruin; whole empires even disappear; all that mortals produce is mortal like them (author's translation)

The origin of Ségur's apocalyptic vision is clear: the destructive power of the French Revolution throbs unremittingly through this passage. It can only be countered by one force – Nature:

> et pour confondre la vanité, la Nature, constante et tranquille, leur montre, dans les plus légères de ses Productions, le cachet de l'immortalité. [. . .] Les plus illustres Dynasties se détruisent par les tempêtes politiques; et les Familles éternelles des Plantes et des Fleurs ne connoissent point de révolution [. . .] (1-3)
> and to thwart this vanity, Nature, calm and constant, reveals to them in the most delicate of its productions the character of immortality [. . .] The most illustrious dynasties destroy themselves in political storms; and the eternal families of plants and flowers do not know revolution. (author's translation)

Nature, man's superior, had much to teach him about stability, order and productiveness. And plants invariably "knew their place", maintaining the position assigned to them according to their individual qualities (3).[8] Ségur's defence of the old hierarchies was unmistakable.

The plant world not only provided a model for political order. It was also a "pure and inexhaustible" source of magnificent images on which poets and moralists alike could draw to make their own work less sober, more subtle and more sensitive (4). These visual possibilities were what made botany accessible to children, Ségur proposed, and were the science presented in a simpler and more digestible form than that used by the learned figures currently studying it, it could rank among the most important pastimes for children. Indeed, there was enough material in the Book of Nature to make their young people more sensitive to the world around them and more aware of their place in it (4). Wakefield would have agreed wholeheartedly with this last comment. Thus as Ségur drew his preface to a close, it regained something of the calmness and the religious conviction that characterised Wakefield's writing and engagement with botany.

Ségur's opening political diatribe could not have been further removed from Wakefield's apolitical stance. Overtly political comments rarely enter her private writings, let alone her public ones. In a diary entry of 18th November 1799, she quietly notes "Buonaparte has effected a revolution in France" (Mews MSS 284/2/21 58),

remarking more judgementally some fifteen years later in a letter to her grandson Felix: "Buonaparte is great but not good, that is, he has superior talents, but is void of virtue and religion, he seems to forget that men must give an account of their actions in another life" (Mews MSS 284/1/3). Thus Ségur's prefacing of the translation with a series of comments that clearly pointed back to the revolution of ten years earlier gave the *Flore* a distinctly outspoken political voice that was a very far cry either from the tone of the *Introduction to Botany* or indeed the political persuasions of its author.

Ségur's coupling of the botanical with the political is striking, but not particularly unusual. Already by the 1790s, new ways of thinking about the plant world had in some circles become aligned with revolutionary Jacobin culture that threatened established order (Bewell 132-39). From Erasmus Darwin's *Loves of the Plants* (1789), published the same year as revolution broke out in France, to Wollstonecraft's *Vindication of the Rights of Woman* (1792), ideas about sexuality and freedom were being radically questioned, if not rewritten. Just as the Flower Power movement of the 1960s reworked the symbol of the flower to freight it with a host of moral, social and political meanings, so the same had occurred some two hundred years earlier. Cultivated flowers, known as 'luxuriants', which were beautiful but sterile, pointed to the pernicious culture of luxury as much as to the ills of continental horticulture which largely generated them. They stood in stark contrast to home-grown and native wild flowers which represented simplicity, purity and health. Meanwhile Rousseau's call to a return to a state of nature similarly cast the natural world as one of social and political harmony, democracy and equality (Bewell 134).

Ségur's comments on how he came to consider translating the *Introduction to Botany* are revealing of his own position with regard to the authorship of the *Flore des jeunes personnes*. By recasting the very title of the work away from Wakefield's stiff and formal "Introduction" towards something that directly addressed a target audience of "jeunes personnes", Ségur's translation explicitly seeks to gain popularity by appealing to a young readership. But as his preface clearly reveals, Ségur's concern to bring botany to the attention of the young people of France is far from wholly disinterested:

> Comme je m'occupois de cette idée, j'entendis parler d'un Recueuil de Lettres sur la Botanique, composées en Angleterre par Priscilla Wakefield. Je le parcourus, et il me parut, par sa simplicité et sa clarté, très-propre à remplir le but que je me proposois. (5)
>
> As I was occupied with this idea, I heard talk of a Collection of Letters on Botany, composed in England by Priscilla Wakefield. I glanced through it and it seemed to me that its simplicity and clarity rendered it most suitable in fulfilling the task that I had set myself. (author's translation)

Those final words "le but que je me proposois" are telling. Wakefield's text already fulfilled the aims that he had had in mind himself, namely to publish an elementary work on botany. But to make a translation of her text in which he was an 'invisible' translator would fail to grant him the prominence – intellectually, scientifically, pedagogically – that he craved. Wakefield's work was therefore a useful basis for him on which to construct his own persona as a scientist and scientific educator – and through which his own (male) voice would speak.

Wakefield set out her own 'gender agenda' quite clearly in the preface to her *Introduction to Botany*. Natural history, she had argued, possessed many advantages:

> it contributes to health of body and cheerfulness of disposition, by presenting an inducement to take air and exercise; it is adapted to the simplest capacity, and the objects of its investigation offer themselves without experience or difficulty, which renders them attainable to every rank in life. (vi)

But it also had its shortcomings for the inquiring female mind:

> but with all these allurements, till of late years, it has been confined to the circle of the learned, which may be attributed to those books that treated of it, being principally written in Latin; a difficulty that deterred many, particularly the female sex, from attempting to obtain the knowledge of a science, thus defended, as it were, from their approach. (vi)

Not for nothing, then, are Latin terms simply footnoted in her text. In the nineteenth letter, for example, which focused on the class of tetrandria – the class of plants with four stamens of the same length – she mentions motherwort, ground ivy and catmint, self-heal, thyme and basil. The Latin terms for all of these can be found in footnotes at the bottom of the page, should the reader have been interested (123). So in Wakefield's text Latin is, quite literally, pushed to the margins. In Ségur's translation, by contrast, the terms are all absorbed into the main text itself. Since Wakefield draws on so many examples, Ségur's text is as a result overloaded with Latin terminology in a way in which the original is not:

> L'*agripaune* (leonorus), le *lierre terrestre* (glechoma), la *menthe* (mentha) la *germandrée* (tencrium), la *bugle* (ajuga), la *bétoine* (betonica), l'*ortie blanche* (lamium), la *chatadie* (nepeta), la *ballote* (ballota), le *marrube* (marrubium) ont aussi un calice pentaphylle; mais le *thym* (thymus), la *brunelle* (brunella), l'*origan* (origanum), le *chinopode* (chinopodium), la *mélisse des bois* (melitis) et la *mélisse* (melissa) ont un calice à deux lèvres. (127) (original italics)

This passage therefore hinders reading because the reader is continually obliged to jump between French and Latin terminology – unlike the same passage in Wakefield's text, which reads much more smoothly since it is not packed so full with botanical names in two languages:

> A cup, divided into five clefts, is a circumstance in which the following plants of this order generally agree: Motherwort, Ground Ivy, Mint, Germander, Bugle, Betony, Dead Nettle, Catmint, Henbit, Horehound; but Thyme, Self-heal, Marjoram, Basil, Balm-leaf, and Calamint, have their calyxes cleft into two parts. (123-24)

But Ségur's inclusion of Latin terminology is not only disturbing to the reader because it slows his readers down or presents them with a surfeit of information to process. On one occasion he would surely have left his French female audience acutely embarrassed, where Wakefield's lady readers would have had to scour the small print at the foot of the page to be discountenanced to quite the same degree. In the final letter of the collection which examined various species of fungi, French readers were confronted directly with the following in the main text:

> La *morille* (phallus) est connue par sa surface inférieure lisse, et non poreuse. La surface supérieure est comme un réseau. Celle qui est bonne à manger est portée sur une tige nue et ridée: sa tête ou son chapeau est ovale et remplie de petites cellules. (198-99) (original italics)

In essence, this is a faithful translation of Wakefield's description of this plant:

> The Morell is known by a smooth surface underneath, and a kind of network on the upper part. That which is eaten has a naked, wrinkled pillar, and a hat that is egg-shaped and full of cells. (187)

While Wakefield also referred to the term "phallus" in her footnotes, the English reader is not directly confronted with the similarity between this plant's structure and male genitalia. By juxtaposing the French and Latin terms in the main text, Ségur's translation makes this connection very explicit. A French woman reading this letter out loud to her charges or (female) companions would have had to be quick-witted enough to pass over the Latin term and plough boldy on. The more curious British lady reader might well have let her eye stray to the bottom of the page in Wakefield's text and discovered the same term. But, given the realm of possibilities that paratext offers to be considered both spatially and thematically peripheral, she could have left her discovery modestly uncommented.

Thus Wakefield's intention to write a text that could be read easily by a demure female audience was confounded by Ségur's realignment of her text towards a (male) readership. He clearly considered that he was writing and translating for an audience already initiated into the language of professional science – which still had Latin as a *lingua franca* at the time. He also failed disastrously to reflect on how (in)appropriate his piece would be for young ladies. It is interesting to note that where in the English version, Wakefield has Felicia comment "I am impatient to make a beginning, but am full of the number of hard words at the entrance" (18), Ségur omits the word "hard" in French so that the translation simply reads "Je ne veux point m'effrayer par la multitude de mots nombreux qu'il faut retenir: c'est une difficulté dont la persévérance triomphera" ("I do not want to be frightened by the many and numerous words that have to be committed to memory: it is a difficulty over which perseverance shall triumph"; author's translation) (12). He therefore shows little understanding of the problems that the very language of science could present to his amateur (female) readers: indeed, it almost seems as if women have no real place at all in Ségur's thinking about how and for whom the French translation should be written.

Ségur's reorientation of the *Flore des jeunes personnes* to emphasise its scientific nature went beyond the deployment of Latin in the main text, though. It served his purpose of restating his claim both to be the figure underpinning its entry onto the French market and a male scientist (*polytechnique*-educated, he stressed on the title page) who was intellectually superior to the *Flore's* female author. Ségur added information which both supplemented and corrected Wakefield's narrative. What was striking about deadly nightshade, one of the key plants in the poisonous *Luridae* family, was that it had a wheel-shaped corolla and stamens with oblong lips, Wakefield had observed (79). Ségur disagreed. What was actually an essential feature of deadly nightshade, he argued, was that each anther was perforated with two holes through which the pollen escaped – a point he made briefly in a footnote (79). The addition of this information not only points to a potential difference in educational

aims but also implicitly asks whether an amateur botanist could be expected to see such minute details and whether these were important facts they should know. More urgently, it queries how Ségur characterised the audience of the *Flore*. Would a remark about how pollen escaped not encourage in the female reader's mind those titillating thoughts about plant reproduction which the Reverend Richard Polwhele had satirised in his polemical poem *The Unsex'd Females* (1798)? Certainly Ségur's additional footnote gestures towards the differences between what men and women could engage with in their botanical studies, and further underlines Wakefield's concern with the structure of the plant in stasis, while Ségur placed greater emphasis on the dynamics of pollination and reproduction.

Ségur's additions were sometimes more obtrusive. He fiercely interrupted Wakefield's discussion of the "Vallisneria of Italy" (*Vallisneria spiralis*) in her section on aquatic plants that were polyandric (with numerous stamens), to correct the implicit suggestion that the Vallisneria belonged to this class (122-23). Rather, he remarked in a footnote covering a good three quarters of a page that this plant was diandric (i.e. had two stamens). He then went on to discuss in some detail how the single white flowers grow up to the surface and, if pollinated, are then curled back in a spiral fashion under the surface of the water, as the fruit begins to grow. Thus Ségur exploited the implicit multivocality inherent in translation to demonstrate his superior knowledge by both amending and supplementing Wakefield's text. His critical attitude to the source text both frames and invades the translation, in which he functions as more than purely the 'animator' of Wakefield's English original. Here he becomes a very real, dominant, presence in the text which itself becomes a space in which knowledge is constructed and contested.

Ségur's translation was concerned with the construction of other identies, not just his own. In this final section, I will explore Ségur's engagement with issues of national identity and science. He adopted a rather dissociative tone when it came to the relative importance of Linnaeus in the establishment of a plant taxonomy, subtly reinstating his compatriot Joseph Pitton de Tournefort alongside Linnaeus on a number of occasions, and thus reminding the French reader of Tournefort's achievements. Linnaeus is principally considered to have given botany a new impetus by organising the plant world according to the organs of reproduction and by introducing a binomial system of classification, genus and species – each characterised by one single word. Tournefort, working approximately fifty years earlier, had also made a distinction between genus and species (although the organisation of his *Insitutiones Rei Herbariae* (1700) owed much to the structure of herbals, starting with smaller plants, moving on to shrubs, bushes and then trees) – but organised his taxonomy around the structure of the corolla.

Wakefield's work was unashamedly Linnaean in outlook. As she enthuses in her discussion of eminent naturalists:

> Tournefort is a name that was highly distinguished on this list, before the time of Linnæus, whose superior genius has raised him above all his predecessors: his system is now universally adopted. (42)

Whereas in the French translation we read:

> Tournefort est un de ceux qui eurent d'abord beaucoup de réputation jusqu'à ce que Linné eût surpassé, par son génie, tous les prédécesseurs et ses

> contemporains botanistes; son système est presqu'universellement adopté. (39)
> Tournefort is one of those who acquired great distinction initially, until Linnaeus surpassed all his predecessors and contemporary botanists by his genius; his system is now almost universally adopted. (author's translation)

The addition of the word "presque" ("almost") is subtle, but it is important. It gives a slight tarnish to the brilliance of Linnaeus's genius that had shone out of Wakefield's text. And Ségur goes one step further by adding in a footnote to this line that Tournefort's system was actually easier and more accessible for beginners than Linnaeus's nomenclature.

Wakefield's emphasis on the universal acceptance of Linnaeus's system (a point which she repeats again a couple of pages later, where she argues that it is not necessary to confound the reader's memory with any other) and the exemplary nature of his system is translated with a little less enthusiasm by Ségur. As Wakefield comments:

> Linnaeus, dissatisfied with every system invented before his time, undertook to form a new one, upon a plan approaching nearer to perfection, and depending on parts less liable to variation. (46)

Ségur makes of this:

> Linné, peu satisfait de tous les systèmes qui existoient avant lui, résolut d'en donner un nouveau au règne végétal, qui se rapprochât plus de la nature et qui eût plus d'ensemble et d'harmonie. (43)
> Linnaeus, scarcely satisfied with all the systems which existed before his time, resolved to give a new one to the plant world, which was closer to nature and which had greater unity and harmony. (author's translation)

The translation does not, at first glance, vary wildly from the original. But I think it is essential that one key word is missing, namely "perfection." Ségur, we must conclude, could not quite bring himself to accept the superiority of Linnaeus over his French compatriot Tournefort. Thus the translation not only demonstrates the extent to which there was a certain jockeying for position between scientists of the time but also that, for some at least, scientific achievement could not be divorced from issues of national identity. It is also interesting that Wakefield's "system" becomes "règne vegetal" with all its associations of royalty and kingship, and that Ségur adds the notions of "ensemble" and "harmonie" that draw us back to the sense of order that Ségur was convinced that the *ancien régime* had embodied.

The French translation of the *Introduction to Botany* therefore constituted the meeting of two very different minds: that of Wakefield, a middle-aged devout Quaker woman, largely self-taught and a great advocate of 'sociable' learning, and that of a young *polytechnique*-educated aristocrat, keen to vaunt his knowledge, who saw education principally as instruction. These radically different backgrounds, and the authors' divergent approaches to scientific education, gender and politics, meant that the notion of 'revolution' was articulated in the *Flore des jeunes personnes* in a variety of different ways. The English source text itself was quietly revolutionary in its determination to facilitate women's access to science through sisterly modes of learning that made the transmission of botanical knowledge a sociable undertaking. Its

direct appeal to a female audience through the quasi-intimate formal device of epistolarity, its challenge to women to apply themselves to understanding the intricacies of the Linnaean system and its quiet assurance that all this was within their intellectual grasp made it an important work of its time. Ségur's input into the translation was, in a number of different ways, rather less revolutionary. He certainly did not seem keen to embrace post-Revolutionary culture and society, recoiling at the violence, terror and bloodshed out of which it was born. Indeed, he appears to have had some difficulty in locating Wakefield's text within the newly established political, cultural and scientific systems of 1790s France. The plant world on which Wakefield had focused in the *Introduction to Botany* was essentially 'English' in its concentration on native British plants and essentially (if subtly) had a patriotic slant – not unlike William Withering's work which likewise presented the science of botany "in an English dress," specifically oriented towards British women readers (George, *Botany, Sexuality and Women's Writing* 87). Ségur's patriotism was more overt, and, in its nostalgia, implicitly aligned his translation within a political system whose passing he mourned and whose restoration he appeared to seek. For him, botany acquired an idealised, consolatory power as he redefined it to represent a world framed by stability, harmony and order: the world, as he perceived it, of the *ancien régime*. Moreover where Wakefield's work was essentially a descriptive flora, Ségur's translation focused on more complex and – with their sexual implications – more dangerous issues of pollination and reproduction rather than the relatively pedestrian and anodyne activities of description and classification.

The text itself, then, underwent its own turn – its own 'revolution' – in translation. It shifted from being subtly patriotic to highly politicised; from explicitly promoting women's scientific education to only including them implicitly; from being forward-thinking to essentially rather conservative; from being largely free of national concerns to lauding the French contribution to the development of botanical science. Self-referentiality, as we have seen, was an essential characteristic of Ségur's translation: a characteristic which, on occasions, foregrounded his own political and national values and judgements above those of the source text's author. In analysing how Wakefield's *Introduction to Botany* fared in French translation, I have shown how women's botanical writings circulated beyond their home country, allowing them to make their mark in European scientific circles. But I have also pointed up the potential vulnerability of their work in translation: an activity which, paradoxically, both promoted internationally and yet at the same time sidelined their very achievements.

Notes

1. Some thirty years earlier, Rousseau's immensely popular *Lettres élémentaires sur la botanique* (*Elementary Letters on Botany*) (1771-74) had been among the first French-language books to make botany accessible to a wider public; subsequent scholarly and more popularly oriented works included Jean-Baptiste Lamarck's *Flore françoise* (*French Flora*) (1778), Jean-François Durande's *Notions élémentaires de botanique* (*Elementary Notions of Botany*) (1781) and Louis-Claude Richard's *Dictionnaire élémentaire de botanique* (*Elementary Dictionary of Botany*) (1798).

2. For a review of the second edition, deemed "a true present to offer young people," see Rev. of *Flore des jeunes personnes* 330.

3. On the translator's (in)visibility in the target text, see Venuti.

4. For further discussion of the relationship between science and religion in elementary botanical works, see Gates and Shteir (11).

5. Ségur is also considered to have contributed to the translation of Maria Edgeworth's *Belinda*, published in Paris in 1802, although the translators of this work are given as "L.S." and "F.S.".

6. "La véritable invraisemblance seroit de donner à des Anglais du temps d'Edouard III, cet esprit de légéreté, d'insouciance religieuse, d'impiété même, qui caractérisent les Européens du dix-huitième siècle".

7. "Traduction du citoyen OCTAVE SÉGUR, fils" ("Translation by citizen OCTAVE SÉGUR, son") heads the list of his works (including the *Flore des jeunes personnes*) advertised by his father Louis-Philippe de Ségur at the back of the latter's *Contes, fables, chansons et vers* (258).

8. "des Plantes et des Fleurs [. . .] gardent invariablement les places que leur assignent leurs différentes qualités" ("plants and flowers [. . .] invariably retain the place assigned to them by their different qualities"; author's translation).

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Betty Hagglund, "The Botanical Writings of Maria Graham": 44-58

The Botanical Writings of Maria Graham

Betty Hagglund

Botany was a popular and fashionable pursuit for both men and women during the period between 1760 and 1830, its popularity demonstrated by its appearance in magazines, novels and poems, the increasing availability of books aimed at a general readership, the publication of botanical games and playing cards, manuals of instruction in flower-drawing and the existence of substantial audiences for public lectures. Women moved into botanical culture in growing numbers at the beginning of the nineteenth century and botany became increasingly seen as suitable for female study.[1]

The early nineteenth-century traveller and author, Maria Graham (1785-1842) came of age during this period of growing interest in botany and it continued to be a central interest throughout her lifetime, forming a significant element within her writing and shaping her activity when travelling. Her involvement in plant collecting and her active participation in the international network of collectors organised by William Jackson Hooker, Professor of Botany at Glasgow University and later Director of Kew Gardens, shed light on the participation of women in scientific activity during the first few decades of the nineteenth century. I demonstrate for example, that Graham is important in challenging misconceptions about women's 'botanising' being confined to their local area. Whilst this is true for the majority, especially in the eighteenth century, there were exceptions, and a few British women, mostly (although not exclusively) colonial and diplomatic wives, whose particular circumstances enabled them to travel further afield, botanised as part of the imperial project in the early nineteenth century.

The ease and simplicity of use of the Linnaean system for classifying and naming plants, coupled with the publication of British translations and adaptations of Linnaeus, many of them aimed specifically at a female audience, helped to make the study of botany increasingly popular among British women. So too did the expansion of the British Empire and the growing number of travellers and explorers who returned to Britain with plant specimens and drawings. It has been argued that "natural history in general, and Linnaean botany in particular, [was] the dominant epistemological paradigm . . . of the period" in relation to travel writing (Leask 47). Johannes Fabian gives the example of Linnaeus's 1759 *Institutio Peregrinatis* (scientific instructions for travellers) as evidence of "the roots of the new science of travel in natural-historical projects of observation, collection, and classification, and description" (8); Roy Bridges asserts that "the three voyages of James Cook [between 1768 and 1779] set the pattern of government demanding scientific investigation as part of a search for precise and accurate information whether or not this pointed to economic opportunities" (55); and Mary Louise Pratt has claimed that:

> [i]n the second half of the eighteenth century, whether or not an expedition was primarily scientific, or the traveller a scientist, natural history played a part in it. Specimen gathering, the building up of collections, the naming of new species, the recognition of known ones, became standard themes in travel and travel books. (27)

This claim needs to be qualified; there were many other competing discourses and Leask himself argues strongly for a parallel aesthetic and archaeological discourse in many early nineteenth-century travel accounts, suggesting that "[i]n many . . . travel narratives . . . the systematic protocols of natural history, antiquarian curiosity, and Taste (reflected in the 'indirect discourse' of the traveller's response to people and places) coexist in loose solution, reflecting the 'predisciplinary' nature of the genre itself" (48). Other travel texts of the period were further shaped by missionary discourses or those of captivity and slave narratives. Nonetheless, it is clear that for many travellers of the late eighteenth and early nineteenth centuries, regardless of the purpose of their travel, natural history, particularly botany, formed a major part of the experience and the narrative which resulted from that experience.

As I have said, the particular circumstances of colonial and diplomatic wives enabled them to travel further afield as part of the imperial project. Many of these women created herbaria and botanical gardens at the places where they were stationed and sent back to England plant specimens, both live and dried, seeds and botanical drawings. Georgiana Molloy (1805-1843), for example, who emigrated from England to Western Australia with her husband, sent back seeds to various botanical gardens. Lady Henrietta Clive (1758-1830) who arrived in India with her husband, the Governor, in 1798, established a garden and recorded the plants of the area of Mysore and the Carnatic. Annabella Telfair (d. 1832), wife of the naturalist and colonial officer Charles Telfair, collected marine plants in Mauritius; many of her drawings of botanical specimens were published by prestigious European scientific journals.[2]

Similarly, a particular set of family and marital circumstances enabled the author Maria Graham to travel in Europe, Asia and South America. The topic of botany runs through her travel and other writings but her interest in science began much earlier than that. When in later years she looked back over her life, the early study of botany stood out as a highlight.

> There was a spot which I was very fond of visiting . . . There I became acquainted with the Rest Harrow and the Pettywhin: there grew in full luxuriance all the Trefoil race. There I first saw the streaked Eyebright, the elegant Milkwort, and, sitting upon one of the ridges, with the wild Heartsease in my hand, I first heard Shakespeare's fairy description of how it was before milk-white, now purple, with Love's wound.[3] ("Reminiscences" 20-21)

While it would be easy to interpret this passage simply as a schoolgirl's idyllic introduction to natural history, Graham's "Reminiscences" were dictated by her during the last years of her life. At the time she composed the "Reminiscences," she was also working on an illustrated book of Biblical plants which included Shakespearean and other literary references. Although heartsease was not one of the plants included in *A Scripture Herbal*, it is likely that Graham was, at the time, going through Shakespeare's works for botanical references, and she may well have been reminded of the *Midsummer Night's Dream* reference to heartsease during that research process. Nevertheless, Graham's memory of luxuriating in the colours and scents of the plants while being told "fairy" tales from Shakespeare provides a glimpse into the way in which young middle-class girls at the beginning of the nineteenth century were encouraged to respond emotionally as well as scientifically to the natural world.

At the same time, Graham recalled that the classification and identification of plants using William Withering's *An Arrangement of British Plants* (1796) had also formed part of this botanical education:

> With Withering tucked under my arm, trudging along by the side of the governess [. . .] I have often thought myself the happiest creature in the world, while she shewed me how to compare the plants with the description in the book. ("Reminiscences" 21)

Again we see the connection in Graham's memory between her early experience of science and the emotion with which she links her memory of the botanical tasks to the context of pleasurable one-to-one time spent out of doors with her "governess."

After leaving school, Graham spent a year in Edinburgh, socialising with university science professors such as Dugald Stewart, John Playfair and John Leslie, and acquiring the nickname "metaphysics in muslin" (qtd. in Orr 97). It was during that time too that her intellectual position, described accurately by Nigel Leask as "a feminised version of Scottish enlightenment civic humanism and 'improvement'" (214) became firmly established. In her "Reminiscences," Graham claimed that it was particularly during that year that "a love for science [was] awakened", recalling the ways in which these men, particularly Playfair, had guided her reading and answered her questions (84, 79). This interest in scientific matters was to continue throughout her life. Carl Thompson argues that Graham's work is at "a level of scientific literacy and accomplishment":

> Graham in her correspondence only touches on scientific issues occasionally, and usually in passing, but when she does so she typically displays quite a sophisticated level of scientific literacy and comprehension. Thus we find her in a letter of 1812 discussing recent publications on what she terms 'the philosophical part of literature', and citing as the most interesting recent development 'Leslie's discovery of the formation of ice by admitting cold thin air to play on the surface of water'. It is a discovery, she suggests, which 'bid[s] fair to furnish some very interesting results to the chemist and geologist'.

Following Thompson we should regard her as something rather more than a mere hobbyist and dilettante then.

In 1809, at the age of twenty-four, Graham began to travel and to publish travel accounts. The subject of botany formed a significant element in Graham's travel writings from the very beginning. In her first book, the *Journal of a Residence in India* (1812), for example, she incorporated botanical studies with observations of scenery, people, customs, buildings and places. This wide range of topics is, of course, characteristic of much early nineteenth-century travel writing and is generally true of both men's and women's texts. As Nigel Leask has argued:

> One of the attractions of travel writing in the period is the uninhibited energy with which it ranges across modern disciplinary boundaries, as the shaping itinerary narrative is punctuated with reports on botany and zoology alongside ancient ruins and monuments, mineralogy alongside modern manners, ancient history alongside contemporary politics. (1-2)

Nevertheless, Graham's Indian travel writing is distinguished from that of many contemporary women writers in its scholarly orientalism and its detailed attention to scientific subjects.[4] When visiting temples and private homes, she paid particular attention to recording details of the gardens and their plants. She was careful and detailed in her observations:

> I remarked . . . the *Saguerus Rumphii* [sic], a kind of palm, from which an excellent kind of sago is made. It is also valuable on account of the black fibres surrounding the trunk at the insertion of the leaves, which afford a cordage for ships, said to be stronger and more durable than that made from any other vegetable substance. (Graham, *Journal of a Residence in India* 125)

As the above also illustrates, she showed an awareness of the potential for economic exploitation. Visits to the gardens of the naval hospital in Madras and the Calcutta Botanical Gardens formed part of Graham's itinerary and at each spot she highlighted plants of particular interest, using scientific terms and including contextual information on culinary, medicinal and manufacturing uses of the plants she described. On several occasions she quoted directly and extensively from John Fleming's *A Catalogue of Indian Medicinal Plants and Drugs* (1810).[5]

The Calcutta Botanic Gardens, founded by the British East India Company in 1787 with the objects of identifying new plants of commercial value and growing spices in an attempt to challenge the Dutch spice monopoly, have been described as "the greatest of the imperial botanic gardens," despite the saltiness of their soil and their initial inaccessibility on the north bank of the Hooghly River (McCracken 6). The botanist and physician William Roxburgh, who served as superintendent of the garden between 1793 and 1813 increasingly concentrated on the scientific side of the garden, introducing a vast number of new plants, recording meteorological data and creating a herbarium. The gardens were a popular destination for visitors to Calcutta and Graham was no exception. She described the gardens and trees in detail, commenting particularly on the great banyan tree, already thirty-one years old, with its "monstrous warty trunk, of soft useless wood . . . crowned with a few ragged branches and palmated leaves" (*Journal of a Residence in India* 145), compared an evergreen tree with similar trees in Europe, suggesting that the differences might be attributed to variations in climate and noted that:

> Carefully preserved there is a cajeput, from the leaves of one species of which (Melelucca cajeputi) the famous cajeput oil is extracted, which is used by the inhabitants of Malacca and the eastern isles, of which the tree is a native, as a sovereign remedy for rheumatisms, swellings and bruises. (*Journal of a Residence in India* 145)

As before, we see Graham's interest in the uses to which a plant is or could be put and its potential for economic exploitation. From the 1770s, the East India Company had closely identified botany with practical needs and commercial opportunities, and the Calcutta botanic gardens had been explicitly established for practical purposes (Arnold 162).

Graham's text spoke warmly of time spent at the gardens in the company of Dr Roxburgh and his family. It is likely, I would argue, that her ideas about the importance of practical and economic botany in a colonial setting were at least

partially shaped by her conversations with Dr. Roxburgh, a Scottish scientist of similar age and background to those who had so strongly influenced her in Edinburgh.

As part of his project to identify and publish the local flora, Roxburgh employed local artists and by 1813 had 2533 illustrations of local plants.[6] He allowed Graham to watch the artists at work and to examine the portfolios of drawings. She was impressed with what she saw, writing that "they are the most beautiful and correct delineations of flowers I ever saw. Indeed the Hindoos excel in all minute works of this kind" (*Journal of a Residence in India* 146).

Graham herself travelled with a sketch-book and watercolours and her drawings show the same care and precision as her plant descriptions. As was usual for young women of her class, drawing had formed part of her education and she was a competent, although not gifted, artist. Other women travelling in India also drew and painted plants and recorded botanical findings in diaries and journals. Mrs James Cookson, the wife of a military officer, for example, completed thirty botanical drawings of Indian indigenous plants which were published in 1835 as *Flowers Drawn and Painted after Nature in India*; Clementina Abbott drew plants in the Calcutta Botanic Gardens; a few decades later, Lady Charlotte Canning, the wife of the governor general of India, collected specimens, visited botanic gardens and drew and painted plants.[7]

Fissell and Cooter have traced the ways that, during the eighteenth century, "knowledge and practice concerning plants (which were increasingly collected under the rubric of 'botany') changed in a variety of ways," arguing that:

> One kind of botany was the common property of many social groups: the knowledge of plants useful to humans. Country dwellers were familiar with cutting reeds for thatching, collecting thistledown for stuffing pillows, and using horsetail to scour pots and pans. . . . knowledge of healing plants was extensive among laborers, artisans, and rural folk. Indeed, it was sometimes acknowledged that country people knew more about plants than their betters. As a boy, Joseph Banks (1743-1820) paid herbwomen to teach him the names of flowers. William Curtis (1746-1799), later to found the *Botanical Magazine*, became interested in flowers during conversations with an ostler who studied herbals. (151-152)

By the second half of the eighteenth century, there was a shift away from this type of folk knowledge and for both men and women of the upper and middle classes, Linnaean nomenclature gradually replaced the old vernacular names. Interestingly, however, while Maria Graham did use Linnaean terminology frequently and correctly, she consistently combined this with a respect for the knowledge base of local people. She learned languages easily and throughout her accounts of her travels we find her consulting local people about plant names, uses and methods of propagation and cultivation. This localism could be considered to be at odds with the Linnaean universal totalising project of observing, cataloguing, and systematising, a project often associated with European colonialism and imperialism and a type of European knowledge-making which could be used, along with other discursive practices such as mapping and measuring, as a means of subordinating and appropriating the non-European world.[8] Graham, however, did not seem to consider there to be any clash or contradiction in her use of varying approaches to the natural world; she merely presented different types of information drawn from both scientific and folk sources side by side. It may be helpful to consider this in relation to the time that Graham

spent in India and her reading of contemporary Orientalist scholarship. As David Arnold has convincingly shown, the question of indigenous botanical agency and knowledge was an area of considerable debate and controversy among Orientalist scholars and colonial botanists. William Jones, for example, "explor[ed] Sanskrit texts to discover what they might say about the 'virtues' or properties of Indian plants, and their 'several uses in medicine, diet or manufactures'" (Arnold 177), and in his *Design of a Treatise on the Plants of India* argued that the use of Sanskrit names for Indian plants was more appropriate than the use of Linnaean terminology, although he accepted that the Linnaean system of classification was "the clearest and most convenient of methods" if some alterations were made to the names of the classes (3-5). Similarly, Jones's paper "On the Spikenard of the Ancients" combines Linnaean classification and description, information provided by local informants and a discussion of the uses to which the plant could be put (13-31). Other scholars such as the surgeon-naturalist Benjamin Heyne explored vernacular categories and descriptions of landscape and vegetation; still others studied *materia medica*. According to Arnold:

> After the era of Jones and high Orientalism, surgeon-botanists tended to move away from interrogating texts . . . to the questioning of Indian informants or the observation of indigenous plant practice. The "scientific auxiliaries" to whom the botanists turned included *hakims* and *vaids* (as practitioners of indigenous medicine the source of much information about medicinal plants), but also merchants, gardeners, and others who might possess a practical knowledge of plants and their products. . . . This turning away from elite to local commercial or artisanal knowledge signaled the dwindling authority of scholarly Orientalism and the increasing emphasis upon Indians as repositories of empirical knowledge. . . . Without actually elevating it to the level of science, there could be genuine botanical appreciation for the practical know-how that Indians possessed.[9] (180-181)

While in India, Graham spent time with a number of noted Orientalists; her two books on India indicate that she also read widely within Orientalist scholarship, including the works of Sir William Jones. Simultaneously, some of her time in India was spent with practical colonial botanists such as Roxburgh, whose interest in economic botany and *materia medica* is discussed above. The influences of Graham's Indian experiences, I would suggest, shaped her approach to botany, leading to a belief that Linnaean classification could be combined with local information.

In 1821 Graham travelled to South America with her naval officer husband who had been sent to patrol the coasts of Brazil. The South American independence movements were reaching their peak and British economic interests in the area were growing. Thomas Graham died at sea in April 1822, while en route for Chile. Despite the efforts of the local expatriate community to persuade her to return to Britain, Maria Graham remained abroad for several years, travelling and carrying out scientific observations and experiments. While botany had certainly been a significant theme within Graham's Indian writings, in Brazil she seems to have become much more actively involved in a scientific way.

Early nineteenth-century British naturalists relied heavily on correspondents, who supplied specimens, drawings and information, often in exchange for further information or plants. While there were some plant collectors who were employed full-time, many of the others were amateur botanists. William Jackson Hooker,

Professor of Botany in the Medical School at Glasgow University and later Director of Kew Gardens, developed a web of connections which enabled him to obtain plants and seeds from a global network of correspondents. In Britain, both men and women sent him specimens. Edward Hobson, a Manchester warehouseman, for example, provided Hooker with specimens of mosses between 1815 and 1830, and Amelia Griffiths corresponded with Hooker and supplied him with seaweeds collected in Dorset, Cornwall and Devon over a period of thirty years (Secord 404-405; Shteir, "Amelia Griffiths"). As discussed above, while only a few women travelled abroad, some were enabled by virtue of their father's or husband's professions to range further. It is clear from the directors' correspondence in the archives at Kew Gardens and from articles in contemporary botanical journals that women were active in international plant collection and in the supply of specimens to the British botanical gardens. Hooker's letters to Maria Graham and to other diplomatic and colonial wives provide evidence for a web of connections between the major botanical gardens of Britain and travelling women.

Hooker drew Graham into his project of plant collection and much of her time in South America was spent in collecting, drying and drawing seeds and plant specimens for Hooker, often using a microscope to portray them in more detail. Hooker rewarded his correspondents with attention and praise and encouraged them to develop their botanical knowledge. He supplied Graham with books and equipment and she responded with carefully dried specimens.[10] Concerned at the fading of the colours when the plants were dried, she wrote:

> Pray in case of the fading of the colours of dried specimens might it not be advisable for me to add enough col[d] [coloured] sketches – say, just an outline with the real colour of a petal and a leaf? – I do not habitually draw flowers but I could do that – & also any peculiar form of seed &c. – Only let me know how I can be useful & I will try to be so. (Letter to William Hooker. 11 April 1824)

She went on to draw from life the plants she was sending as dried specimens and an unpublished album of approximately 100 botanical illustrations together with notes and descriptions is held by the archives at Kew Gardens, many of the pictures showing the same plant at various stages of growth, others providing views of the individual parts of the plant. In most cases, Graham has labelled the drawing with the date, time of day and location at which the original subject was found.

In January 1825 she reported sending home "by the Ansons Frigate a parcel . . . containing twenty-two species of fern," giving specific details in the letter of where the ferns had been found growing and the nature of the soil (Letter to William Hooker. 30 April 1825). She also explained the problems she was having in drying the specimens to a satisfactory standard.

> In the first place many of the plants are of a nature that will not dry they are so fleshey [sic] – & these are the most beautiful & strange –in the next place the heat & damp of the climate especially in the flowering times is very much against success. – the Mould is worse than the insects then all is so full of life that the very plants themselves under their skins often contain the seeds of destruction or degeneration . . . we will do our best.

Graham's letters are crucial in documenting women's involvement with plant collecting in the early nineteenth century. Her name often appeared in lists of plant collectors in Hooker's periodical articles. There is evidence that Hooker regarded female and male collectors as equal and neither gender nor official position seem to make a difference to the way he refers to his correspondents. For example, in 1833 he wrote:

> This memoir was, in the first instance, undertaken with the view of making known to botanists the vegetable treasures brought home by Mr. Cuming . . . But as we had received many of the same plants from other sources: for instance, those of Chili from Mrs. Maria Graham (now Mrs. Callcott), from our valued friends Alexander Cruckshanks, Esq. and Dr. Gillies, Messrs. Lay and Collis, the naturalists in Captain Beechey's expedition, from Mr. Bridges and Mr. Mathews, two excellent collectors . . . we gladly embrace the opportunity thus afforded us of noticing the whole of them together. (Hooker and Arnott 129)

Later mentions in the same article again make no distinction by gender. That this was Hooker's general attitude and not particular to his relationship with Graham is clear from Hooker's references to other women collectors, which are equally gender-neutral (*Exotic Flora* 192, 203, 206; *Companion* 246). Plant collectors were frequently honoured by having plants that they had discovered named after them and Maria Graham was no exception. In 1827, Hooker named an entire genus after her because of seeds she had gathered in Chile, and later further called the Escallonia *Callcottiae* after her (Hooker and Arnott 342; Desmond 127).

References to Graham appear in the writings of other contemporary male botanists. She is consistently treated as a significant collector, although they are more likely than Hooker to preface her name with a complimentary adjective or phrase. Dr. Von Martius, for example, refers to "A highly accomplished English lady" (26), John Sims calls her an "ingenious and sensible authoress" (2644) and David Douglas writes of her "talented pencil" (86). Nevertheless, despite this foregrounding of gender, she is regarded as a serious informant by all of them and quotations from her are used to supply further information without qualification.

The two books published after Graham returned to England contained considerable detailed information on the flora and fauna of Chile and Brazil.[11] Appended to the Chilean book was an "Account of the useful TREES and SHRUBS of Chile" by Jude Thaddeus de Reyes (Judas Tadeo de Reyes), translated by Graham.[12] Angela Pérez Mejía has suggested that Graham's inclusion of the "Account" within her text could be seen "almost as an act of economic espionage." Suggesting that the "map" that Graham constructs of Chile "resembles a commercial navigation chart of the "new" country as seen by British interests", Pérez Mejía sees the list of trees and their possible productive uses as "a geographic text of political and commercial value" (91). But while Graham does have an interest in commercial matters – the appendix to her Brazilian book consists of several pages of tables of "Imports and Exports of the Province of Maranham, from 1812 to 1821" – she is an inveterate collector of and publisher of technical and scholarly information. The placing of a botanical list within a set of appendices otherwise concerned with political (and to some extent linguistic) matters, I would argue, is to a large extent just another example of Graham's desire "not to be uninteresting or uninstructive", but it does also reflect her general interest in botanical matters. Her own botanical writing

by this stage was more technical and more extensive than had been the case in her earlier travel books, perhaps because of the correspondence with Hooker and her reading of the botanical books that Hooker supplied.

Careful observation and recording was important to Graham and she was highly critical of male travellers who did not observe as well as she did.

> I had an opportunity to-day of observing how carelessly even sensible men make their observation in foreign countries, and on daily matters concerning them. A physician, at dinner, mentioned the medicinal qualities of the *culen* (*Cytisus Arboreus*[13]), and that it would be worth while to bring it into Chile . . . to cultivate . . . I was almost afraid to say, as I am a new-comer, that the country people had shown me a plant they called culen; but, on venturing to tell the gentleman so, he said it could not be because he never heard of it here. I went home, walked to the Quebrada, found the rocks on both sides covered with the best culen, and the inferior sort, which grows much higher, not uncommon. . . . Yet he . . . has resided some years in the country. This same culen is very agreeable as tea and is said to possess antiscorbutic and antifebrile properties, the smell of the dried leaves is pleasant, and a sweetish gum exudes from the flower-stalks. This gum is used by shoemakers instead of wax; and the fresh leaves formed into a salve with hogs'-lard, are applied with good effect to recent wounds. (Graham, *Journal of a Residence in Chile* 139)

Not only has Graham identified a plant which a professional man who has "resided some years in the country" has failed to recognise, but she also demonstrates in this passage that she has considerable knowledge of its uses and medicinal properties, and that she is able to competently draw on both scientific discourses and vernacular knowledge. As discussed earlier, Graham consistently demonstrates respect for folk botanical knowledge. She consults the local people for information about plants and frequently reports what they say. Having described a morning's plant gathering and given detailed information about the plants she has found, she writes "I soon found myself beyond my own knowledge of plants, and therefore took a large handful to a neighbour, reputed to be skilful in their properties" (134). Graham spoke Spanish fluently and, unlike the men whom she criticised, she developed relationships with her neighbours and drew on their knowledge. Her neighbour tells her of the various uses of the plants she has brought – culinary, medicinal, magical, wood good for making plough-shares and flowers that produce writing ink. Although as an upper-class British woman, clearly divided from the average Chilean woman by class and privilege, Graham's attitude is one of an interested learner: there is nothing patronising or condescending about her tone.

Graham remarried in 1827. Her new husband was Augustus Wall Callcott, well-known landscape painter and member of the Royal Academy.[14] For a while her botanical interests took second place – she published several books on art and art history, a history of Spain, a children's history of England and a book on Shakespeare.[15] She was also during this time engaged in translation and editorial work for the publisher John Murray.[16]

Near the end of her life she returned to the subject of botany. A children's book published in 1841 drew on the dialogue form that had been a feature of science books for children at the end of the eighteenth century to teach both vernacular and scientific botanical knowledge.[17] Her final book was again botanical. *A Scripture*

Herbal, written and illustrated over a period of several years, was published in 1842. 'Biblical Botany' had been written about since the late sixteenth century and Graham's book was one of at least a dozen books on the natural history of the Bible published between 1825 and 1845.[18] Each of the plants mentioned in the Bible was described, 121 in all, and each entry included the plant's common name, its Latin name, its Linnaean class, Bible references, a physical description, Shakespearean and other literary and classical references, folklore, medicinal and practical uses, and a woodcut illustration, based on a drawing by Graham. The book included copious references and footnotes. While most of the advertising for *A Scripture Herbal* appeared in general newspapers,[19] the publisher also specifically marketed it as a medical text and it was included in a sixteen page "Catalogue of Works in all branches of Medicine and Surgery" appended to the 1843 volume of the *Medico-Chirurgical Transactions* published by the Royal Medical and Chirurgical Society of London (5). Graham was the only female author to appear in that alphabetical list, although there were a number of other books on botany including Hooker's *British Flora*, Lindley's *Flora Medica* and Henslow's *Descriptive and Physiological Botany,* and her book is listed between a treatise on midwifery and clinical lectures on venereal disease. The book received several reasonably favourable reviews[20] but the fact that Longmans were still advertising it in 1852 would suggest that they still had copies they wished to sell. It was frequently referred to and cited by other reference books until at least the end of the century.[21]

Graham was both typical and unusual. Her interest in botany was, at least in part, a response to the popularity of the subject within early nineteenth century British culture, but her educational background, her intelligence, and her family and marital circumstances enabled her to explore that interest in ways that went beyond those open to most contemporary women, to travel, and to play a genuine part in scientific research and the network of plant collecting that characterised so much nineteenth century botanical research. Her writings, particularly her travel writings, reveal her to be a competent and careful scientist and observer, whose work and observations were accepted by the scientific botanical community as of equal value to those of similar male plant collectors; her gender does not seem to have played much part in this assessment. The extent of Graham's scientific work and writing is not yet fully known, and current research within the archives of the John Murray publishing company may well uncover further related material, particularly in relation to Graham's anonymously published pieces for Murray's various periodicals. Further research on Graham's involvement in serious geological work, including her 1834 public row with George Greenough, President of the Geological Society of London, over the accuracy, or otherwise, of observations that she had made of a major earthquake in Chile in 1822, is also underway.

Notes

The initial research for this paper was carried out while working as Research Fellow on the "Maria Graham: The Woman Writer and the Cultures of Travel, Science and Publishing in the Early 19th Century" project at Nottingham Trent University. I wish to express particular thanks to Carl Thompson, whose willingness to share research findings and ideas about Maria Graham and science helped to shape the thinking that underpins this essay.

1. For discussion of women's participation in botany during the late eighteenth and early nineteenth centuries in Britain, see Shteir, *Cultivating Women*; George; McEwan.

2. See Hasluck; Rivière; Boulger; Raza121-124, 255-277; Endersby chapters 3 and 4.

3. The passage from Shakespeare comes from *A Midsummer Night's Dream.* 2.1.169-175: "Yet mark'd I where the bolt of Cupid fell:/It fell upon a little western flower,/Before milk-white, now purple with love's wound,/And maidens call it love-in-idleness . . . /The juice of it on sleeping eye-lids laid/Will make or man or woman madly dote/Upon the next live creature that it sees."

4. A similar level of scholarship and interest in science, particularly botany and geology, is equally central to Graham's later travel writing. There were of course other women travel writers in India who demonstrated a knowledge of orientalist scholarship, although these were generally later than Graham. See, for example, Anne Elwood, *Narrative of a Journey Overland from England* and Marianne Postans, *Western India in 1838*.

5. For example, Graham's footnote to page 86 quotes Fleming's views on the dispute between various authorities as to whether or not the Indian Ganja plant was a separate species from the European *cannabis sativa.*

6. Dozens of local artists were used but very few of their names have been recorded (McCracken 155).

7. Cookson; Desmond 1; Shteir, *Cultivating Women* 192. For further discussion of British women's natural history collecting and flower painting in India during the late eighteenth and early nineteenth centuries, see Raza 121-124, 181-182.

8. For further discussion of the role of natural history as part of the imperial project, see Arnold, 11-31; Pratt, 1-12.

9. I would take issue with Arnold's claim that the use of local informants is a direct sign of the "dwindling authority of scholarly Orientalism." As already mentioned, there is considerable evidence within Jones's botanical writings of his own use of information gained from local people. The increased use of local informants did coincide with the decline in scholarly Orientalism, but there is not necessarily a causal relationship.

10. Before the invention of Wardian cases (tightly sealed boxes with glass roofs that allowed condensing water vapour to moisten the soil without watering being needed) in 1835, only a small proportion of live plant specimens sent from abroad reached Britain safely. Drying of specimens was often therefore necessary.

11. *Journal of a Voyage to Brazil and Residence There during Part of the Years 1821, 1822, 1823* (1824); *Journal of a Residence in Chile, during the Year 1822; and a Voyage from Chile to Brazil in 1823* (1824).

12. De Reyes had been secretary to Ambrose O'Higgins, father of the Chilean independence leader Bernard O'Higgins, and his son was a friend of Graham's. See Sepulveda 24-26. The original Spanish account has not been traced.

13. [Graham's note: Frezier gives an excellent plate and description of it. See likewise the appendix.]

14. To avoid confusion, I will continue to refer to her as Graham in this paper, other than in notes relating to publications published under the name of Callcott.

15. A full list of Graham's twenty-one books can be found at *The Maria Graham Project*, together with a preliminary list of her contributions to periodicals.

16. Graham had been involved in work for John Murray for a number of years; recent research in the John Murray archives at the National Library of Scotland is only beginning to reveal the extent of her involvement. She read manuscripts and advised on their publication, she commissioned illustrations, she saw some books through the entire process from manuscript to printed volume. There is evidence from her correspondence that she contributed articles anonymously to Murray's periodicals. In 1826 Murray employed her to edit the official account of George Anson's voyage to the Sandwich Islands, which was published as *Voyage of H.M.S. Blonde to the Sandwich Islands in the Years 1824-1825*. Part of Graham's remit as editor of the voyage account was the cross-referencing of zoological, botanical and mineralogical specimens brought back by the voyage with specimens already held in British collections.

17. Maria Callcott, *The Little Bracken-burners, A Tale; and Little Mary's Four Saturdays*.

18. For a discussion of some of Graham's predecessors and contemporaries in this field, see Rev. of *A Scripture Herbal* 113-114; and Horne 380-383.

19. *The Examiner, The Belfast News-letter, The Morning Chronicle* and the *Daily News*.

20. Including the *Eclectic Magazine*, the *Church of England Quarterly Review*, the *Gardener's Chronicle* and *The Examiner*.

21. See, for example, Smith 1772; Lindley and Moore Part 1, 98; McLintock and Strong 2:357.

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Heidi Hansson, "Botany as Foreign Science": 59-73

Emily Lawless and Botany as Foreign Science

Heidi Hansson

The primary goal of botanical science in the eighteenth and nineteenth century was to describe, categorise and define plants according to one of the many classification systems used. Despite its basis in subjectively selected criteria, system-building was perceived as an objective science and as soon as a classification method was adopted, it was considered universally applicable. Carl Linnaeus's Sexual System was structured and easy to understand and became one of the most widely used models. System-building and system-modification remained masculine enterprises, but collecting and classification were pursuits open to all, and botany was promoted as an edifying pastime for both men and women in the Enlightenment period. Linnaeus's System was disseminated throughout Europe in both the original Latin and in various translations, and circulated to a wider audience with the help of popular texts like botanical poems, dialogues and letters. The English versions that popularised the system, however, drew attention to the marriage metaphors Linnaeus used, and the sexual-political climate of the time required that women should be protected from sexualised language. Thus a need – or a market – arose for botanical texts addressed specifically to female users. Apart from being linguistically translated, the texts, or rather the knowledge they contained, needed to be put through a process of what Roman Jakobson terms "intralingual translation": a rewording where what might be construed as offensive language was removed (114). Alongside literal translations designed to be faithful to the original, a number of feminised adaptations of the Linnaean system therefore also appeared, initially written by men but increasingly produced by women writers (George 1-21). It could be said, then, that two types of translations were necessary to establish Linnaean taxonomy in Britain: linguistic translations from the original Latin to English and cultural translations from scientific botanical language to popular and what was regarded as feminised forms.

The most common understanding of translation is the process of changing a text from one language to another, but it can also be defined as "the expression or rendering of something in another medium or form" ("Translation"). The *Oxford English Dictionary* gives the example of translating a painting into an engraving or etching, and in the case of written material, the other medium or form could be the translation of a scientific treatise into poetry or fiction. The process often involves transmitting metropolitan ideas to the conditions in the periphery, which draws attention to the cultural-political dimensions of the activity. Since no translation can be perfectly equivalent to the source text, the effort paradoxically accentuates the differences between the linguistic and cultural systems it is intended to erase. One effect of conveying information in a translated or alternative form may therefore be that the shortcomings of the original are uncovered. In the case of interlingual translations, the impossibility of exact equivalence is frequently noted as a problem. Intralingual translations, on the other hand, are not expected to be completely faithful to the original, and as a result they create spaces for variations, commentary and subversion. By remaining outside the norms of scientific writing, popular botanical works may expand the subject and include dimensions not normally found in a scientific text, such as subjective or emotional responses to the natural world.

Occasionally they also criticise aspects of the discipline that are felt to be ideologically wrong or culturally alien. Such textual strategies are particularly noticeable in nature diaries and garden journals where botanical knowledge is combined with life writing, spiritual reflections and cautious science critique. Most of these literary forms are associated with amateur naturalists, many of whom were women, Occasionally, however, the amateurish style masks or mitigates sharp social and political commentary, as in the case of the Irish writer Emily Lawless (1845-1913).[1] This article places Lawless in the tradition of women's popular science and investigates her strategic deployment of botanical studies to convey discontent with Ireland's colonial situation as well as express a proto-feminist critique of scientific knowledge.

The Hon. Emily Lawless (1845-1913) was the daughter of the fourth Lord Cloncurry, and grew up at Castle Lyons outside Dublin. She was one of Ireland's most well-known writers at the end of the nineteenth century, and published novels, short stories and poetry, as well as journal articles on Irish history and nature. Although she knew William Butler Yeats, Lady Augusta Gregory and a number of other people associated with the Irish Literary Revival, she remained sceptical of cultural nationalism and supported Unionist politics. As a result, she has been placed outside the Irish literary canon in most literary histories, and it is only in recent years that there has been a resurgence of interest in her production. She attempted to write works that were national in sentiment but not politically nationalist and often used subjects from Irish history or Irish nature. Her views are frequently quite radical, despite her conservative political outlook, and she returns to the idea that Ireland is different and impossible to explain with the help of alien systems.

The fear that women would be offended by botanical terminology disappeared over the nineteenth century, but the stylistic features of popularisers like Priscilla Wakefield, Maria Jacson and Jane Loudon continued to influence women's botanical writing well into the twentieth century, with women more frequently employing a more intimate tone than the assertive, authoritative style associated with professional botanists. The gradual professionalisation of the science from 1830 onwards led to its masculinisation, and even though botanical nomenclature was no longer a problem for women botanists, their access to scholarly networks and publication channels remained limited (Shteir 153, 157). There are consequently few contributions from women in the Transactions and Proceedings of various naturalist societies in the nineteenth century. Instead, women's knowledge of horticulture, botany and other varieties of natural science found an outlet in hybrid genres like the nature journal, described by Mary Ellen Bellanca as "a potpourri of aesthetic, autobiographical, *and* factual discourse" (20) (original emphasis), or in what Beverly Seaton terms garden autobiographies, books where "the writer tells the life-story of his garden rather than of himself" (101).

According to Bellanca, the nature diary flourished from the late eighteenth to the late nineteenth century (3), and Seaton dates the beginning of the garden autobiography as a genre to the 1850s, following the rise of the informal, intimate garden in Great Britain (101). Gardening and nature study were promoted as an escape from the pressures of urban life (Bell 473-74), and by the end of the nineteenth century it was possible to identify a "fashion for garden literature," with works mostly written by women ("Books and Authors" 765). Some of these texts mainly describe the year in a garden, such as the Hon. Eleanor Vere Gordon Boyle's (E.V.B.) popular *Days and Hours in a Garden* (1884) whereas others are intimate and subjective, like Mrs C. W. (Maria Theresa) Earle's *Pot-pourri from a Surrey Garden* (1897) and

Elizabeth and her German Garden (1898) by Elizabeth von Arnim (Mary Annette Beauchamp Russell). Emily Lawless's book *A Garden Diary 1899-1900* (1901) is an example of the more personal kind of garden writing, continuing a tradition that was described as "quaint" and genre-crossing even from the start:

> Miss Emily Lawless is sure to write pleasantly and skilfully about gardens and garden thoughts and garden fancies, even though her Garden Diary (Methuen) may suggest recollections of a certain "Pot Pourri" from Surrey on the one hand and a certain "German Garden" on the other. She is discursive and reflective like Mrs. Erle [sic], and not without her affinities with the anonymous Elizabeth, and like both, she is inspired by the true garden enthusiasm. It is a quaint kind of literature, this of gardens; but in skilful hands like those of Miss Lawless it is a very pleasant kind. ("Reviews of Books")

The fuzzy boundaries of the genre sometimes make it problematic to find a place for nature and garden writing in literary studies. *A Garden Diary* includes astute advice and observations about growing habits and the problems of transplantation, but also philosophical digressions, comments on current affairs and personal reflections. Describing the practice of the diarist, Lawless writes that few "mediums of thought are equally fluid; few admit of greater variety; more diversity of mood; more ranging from topic to topic" (237-38). The rambling arrangement gives a deceptive impression of unorganised thought, but the work contains much solid information and scientifically sound observations. The text is thoroughly double-voiced, and Lawless moves between signalling her scientific knowledge by using Latin nomenclature, and foregrounding her amateur status by referring to plants by their English names. Many of the comments and digressions reveal a profound ecological awareness and a respectful attitude that does not regard the natural world as created for human use, but as something that exists alongside, and independent of human beings. The ecological perspective comes to the fore, for instance, in a meditation about weeds where Lawless concludes that these insignificant plants are the best protection against erosion:

> Trees and bushes do much in this direction, but it is the little clinging weeds, which as gardeners we detest, and would so gladly annihilate: these crowfoots why not, by the way, crowfeet? with their crowding roots; these knotgrasses, these clinging bindweeds, it is such as they, backed by sea-spurreys, and bents, and by reeds and rushes innumerable, that do more to keep the waters of the globe in order, and to maintain dry land, than man, with all his dykes, dams, embankments, and such like accumulations, since first he began to strut or to caper over its surface. (24)

The whimsical comment about the plural "crowfeet" introduces a highly specific list of erosion-preventing plants, which diminishes the claims to authority in the passage. At the same time, Lawless boldly assumes the controversial political position of privileging the perspective of the natural as opposed to the human world, and dismisses humanity's attempts to control nature as inefficient in comparison with nature's own systems. Nature emerges as competent and practical, whereas humankind is presented as affected and coquettish, technological endeavours like dam-building imaginatively connected with capering escapades. The suspicious

attitude to technology links Lawless's valorisation of nature to widespread nineteenth-century fears about the ravages of industrialisation and the disappearance of untouched landscapes, as well as foreshadowes the ecological attitudes of a later day.

In *A Garden Diary*, as in most of her nature writing, Lawless follows her women predecessors in making botanical knowledge and ecological principles accessible to non-specialist readers. She does not uncritically transmit received facts, but frequently utilises what was regarded as a feminised model of writing to create spaces in her text where she can question the categorisation activities that constitute the core of the discipline. In particular, she expresses her dissatisfaction with the inaccurate representation of Irish plant life in standard accounts. From the point of view of scientific botany, she is involved in a double and contradictory transmission activity where on the one hand, she uses a deliberately informal style to mediate botanical knowledge to lay readers, but on the other, continually criticises how the same knowledge has been applied to Irish conditions. In a similar way to how Elizabeth von Arnim uses her garden diary as a vehicle for proto-feminist ideas, Emily Lawless uses her nature writing to take part in cultural and political debates concerning Ireland's place in the United Kingdom and the nature and definition of knowledge.

Lawless was an amateur entomologist, botanist, geographer, geologist and marine zoologist, and published on all these subjects in book and article form.[2] Her interest in natural history is revealed also in her fiction, with the main character of her first novel *A Chelsea Householder* (1882) engaged in mothing, and the main character of her third novel, *Major Lawrence, F. L. S.* (1887) a Fellow of the Linnaean Society. Lawless took her nature study seriously and used Linnaeus's system of categorisation in her collecting activities, but she was more of a Darwinist than a Linnaean. In an article about North Clare she describes how an idea she presented regarding plant fertilisation in the area of the Burren was noticed by Charles Darwin ("North Clare" 605).[3] She had wondered about the absence of honey-bees in the region and came to the conclusion that their role in pollination might have been taken over by a moth that is specific to the area. The hypothesis was published in what she describes as "the smallest of notes, in what was probably the smallest and quite one of the most obscure of natural-history periodicals," where Darwin saw it and wrote to her requesting further information (606). For Lawless, the letter represented "a minute but quite imperishable point of glory in an otherwise dim and unnoticeable Past" (606). She sent an essay on the subject to Darwin who thought it good enough to recommend that she should submit it for publication to the journal *Nature* (Ethel Romanes 58). She does not appear to have done so, but she continued to contribute observations of butterflies and moths to entomological journals and collected plant specimens on Clare Island for Alexander Goodman More for the second edition of the flora *Cybele Hibernica* (Praeger 390; Moore and More 193).

A number of references in the *Illustrated Natural History of British Butterflies and Moths* (1874) and a Letter to the Editor of *Nature* concerning the jellyfish Medusa show that Lawless possessed some knowledge of empirical methods of study as well as the scientific language needed to describe her observations:

> While collecting some three weeks since on the south shore of Killary Bay in Connemara, I observed that out of a number of the common *Aurelia aurita* moving about in a rocky inlet below me, one was invariably accompanied by a small fish [. . .]. Occasionally the Medusa turned in its pulsations, so as to bring the umbrella undermost, when the fish would shoot hastily out, but the Medusa had no sooner righted itself, than the fish returned, and seizing its

> opportunity, swam in between the marginal tentacles, and close up to the fringes of the actinostome, remaining distinctly visible through the pellucid disc. [. . .] Associations of a similar character have, I know, been frequently observed in the case of the Physalidæ and other Acalephæ, but not, so far as I am aware, in connection with this species. ("On a Fish-Sheltering Medusa" 227)

The Letter was published under the signature E. Lawless and met with some interest as well as some guarded criticism from George John Romanes in the following issue of the journal. Romanes was an expert on jellyfish and had discovered the presence of a nervous system in the Medusa through his experiments in animal physiology (Schwartz 139). In his comment he asked for a replication of the experiment: "it would be well worth while if Mr. Lawless could repeat his observation a sufficient number of times to exclude the supposition of the somersaults being merely fortuitous" (Romanes, "The Fish-sheltering Medusa" 248). As soon as Romanes found out that the observations had been made by a woman, he regretted his comments, however and wrote in a letter to Charles Darwin:

> I am sorry I made the ungallant mistake about Miss Lawless but I had no means of knowing. If I had known I should not have written the letter, because I am almost sure the movements of the Medusa were accidental, and my pointing out this source of error may be discouraging to a lady observer. (Ethel Romanes 60)

Romanes was of the opinion that because women's brains weigh less than men's, women should also be less capable of performing intellectual work, and published articles on the topic in the *Nineteenth Century* – a journal to which Emily Lawless also contributed (Schwartz 146-47). He accepted that women might emulate men in the field of fiction, but in no other creative or intellectual line of work (146). For Romanes, women were simply physiologically and intellectually inferior, although in fairness, his article only expressed the common attitude at the time (147). Even those of his contemporaries who accepted women's intellectual ability found it difficult to conduct a serious scholarly discussion with a woman since her sex, not her scientific knowledge, determined how she should be treated. Women's engagement in natural science was understood as a pastime to encourage but not as an activity that might lead to important discoveries. Their roles remained restricted also in amateur organisations such as local natural history societies and field clubs. In some cases, their presence was felt to be a distraction and in other cases it was thought to promote a harmonious atmosphere during club meetings, but they were rarely regarded as equal members (Finnegan 69). According to the rules of the Stirling Field Club in Scotland, for example, women could not vote until 1881 and were not allowed to serve as council members (69). Instead, they were encouraged to organise fund-raising activities and bazaars (69). The Irish scholarly network certainly included women, with an Irish flora written in 1833 by Lady Katherine Baily Kane (1811-1886) and the contributions of a number of women plant collectors acknowledged in the Preface to the *Cybele Hibernica*, but on the whole, women throughout the United Kingdom were limited to gathering samples (Colgan and Scully vii-viii). They could identify and categorise the material but were supposed to desist from scientific conclusions.

Romanes's condescending regret about asking for a more thorough investigation of the Medusa can be connected to the historical association between women and nature which supported the idea that women were unable to apply scientific principles (Merchant 1-41). In the case of botany, the fact that flowers were feminised and functioned as emblems of women in literature and art certainly limited women's scholarly authority: if women were themselves flowers, however metaphorically, they could not be expected to be able to be objective in their botanical studies or be considered equal partners in a scholarly discussion (Jackson-Houlston 96-97). Lawless challenges this routine identification of women with flowers when she describes the scarlet windflower as masculine:

> Next to it in the order of flowering stands the familiar single scarlet *Anemone fulgens* [. . .]. What a presence the fellow has, to be sure! What a sumptuous colour – what a magnificent deportment is his! How he takes up the sunshine upon his damask petals and how, even on the dullest days, he seems to give us back our full journey's worth in the mere joy of being temporarily the neighbour of such a vision! I say *he* advisedly, because next to *fulgens* in the order of flowering stands the dimly tinted pale-blue *A. apennina*, as distinctly feminine in the good old-fashioned sense of the word as *fulgens* himself is distinctively the other thing.
>
> Alas for bashfulness and feminine timidity in an age of push and eager competition! ("Florentine Gardens in March" 328-29)

As late as the end of the nineteenth century, referring to a flower as "he" was unusual enough to occasion comment, as illustrated in an anonymous contribution to *Notes and Queries*: "One curious innovation in this amuses us. She speaks of the familiar scarlet anemone in the masculine, and calls it a 'fellow.' We had always held that flowers were all feminine." Lawless describes both the *Anemone fulgens* and the *Anemone apennina* in essentialist gender terms and the gendering of the flowers should not be seen as evidence of a feminist position as the very conventional traits connected with the feminised blue anemone indicate. Nevertheless, she overturns the principle of automatically personifying flowers as women. Her masculinisation of the scarlet windflower suggests that gender designation, like any other form of classification, has to be based on individual qualities and underscores her criticism of an unquestioning division of the natural world into already-determined categories. Her description of the cyclamen is another instance where she deviates from the traditionally feminine flower image. In Erasmus Darwin's *The Loves of the Plants* (1789), the cyclamen is pictured as a tender, grieving mother who places her dead child in the grave:

> The gentle Cyclamen with dewy eye
> Breaths o'er her lifeless babe the parting sigh;
> And, bending low to earth, with pious hands
> Inhumes her dear departed in the sands.
> 'Sweet Nursling! Withering in thy tender hour,
> Oh, sleep,' she cries, 'and rise a fairer flower!' (171)

Lawless, in contrast to Erasmus Darwin's weeping image, gives a very active role to the flowers when she describes them as almost the only plants capable of "acting as their own gardeners" ("Irish Memories" 7). Far from passively leaning over graves,

the cyclamen are "pushing their seed-vessels into the ground and covering them up with mould," doing their "own spading" (7). Such active, forceful imagery stands in obvious contrast to the conventional, female-gendered flower discourse of the nineteenth century and before.

Lawless's nature writing was for the most part published in literary and cultural journals and included in her fiction and poetry, and, like earlier women writers, she often employs a stylistic strategy that downplays her knowledge and authority. Her works abound with modesty markers, as when she describes some lime-loving plants and adds, in parenthesis, "(*calicole* is, I believe, the orthodox term)" (11). The deliberately uncertain statement produces the impression that she is not quite comfortable with scholarly terminology, despite the abundance of Latin plant names on the same page. A similar effect is produced by digressions that indicate that she is not in charge of her own text: "The space of paper which lies at this moment before me is dedicated to gardens; duty requires, therefore, that to gardens and gardens only the words upon it should be limited" (14). Since an authoritative tone is preferred in scientific writing, such stylistic tactics may easily be understood as signs of incompetence or at least an unscholarly attitude. George John Romanes, in contrast, signals his control and orchestration of the material: "Turning now from aquatic organisms to terrestrial, the body of facts from which to draw is so large, that I think the space at my disposal may be best utilised by confining attention to a single division of them" (Romanes, *Darwin* 221). Despite his intention to address "general readers" (vi), he frequently uses the same scholarly language in popularisations of his own and Darwin's ideas as in his scientific articles (Schwarz 135), as when he describes the lancelet:

> It presents, however, a rudimentary backbone, in the form of what is called a notochord. Now a primitive dorsal axis of this kind occurs at a very early period of embryonic life in all vertebrate animals; but, with the exception of Amphioxus, in all other existing Vertebrata this structure is not itself destined to become the permanent or bony vertebral column. On the contrary, it gives way to, or is replaced by, this permanent bony structure at a later stage of development. Consequently, it is very suggestive that so distinctively embryonic a structure as this temporary cartilaginous axis of all the other known Vertebrata should be found actually persisting to the present day as the permanent axis of Amphioxus. (146)

When Lawless describes the lancelet her main purpose is to demonstrate the arbitrary and unstable nature of classification systems by highlighting how the discovery of the organism resulted in a new subdivision of the vertebrates since the lancelet could not be accommodated in the existing classes ("In the Kingdom of Kerry" 548). Romanes instead adopts a comfortably magisterial tone that accepts the classification of the species as an undisputed, albeit interesting, fact. Although phrases like "[w]ell, I have just said" (147) appear in the text they do not function to introduce an intimate voice, but emphasise his role as authority.

Compared with Romanes's stylistic choices, Lawless's self-conscious comments draw negative attention to her digressions as a lack of focus, but her integration of philosophical, literary, spiritual and psychological aspects may also be understood as a way to expand the parameters of nature study. Her digressive style would then function as an act of subversive translation that critiques the limitations of scientific

discourse from within. In *A Garden Diary* she suggests that the scientist may not be the only producer of knowledge about the natural world:

> It has been often debated, and not perhaps very profitably, which of two types of men see deepest into that great arcanum of life which we roughly call Nature. Is it the Man of Science, whose business it is to chronicle what he sees and learns, but who must never travel half an inch beyond his brief? who must cling to fact, as the samphire-picker clings to his rope, and never for an instant relax his hold of it? Or is it on the other hand the Singer, who is only too ready to toss all fact to the winds, and to account it mere dust, and dregs and dross, so he can awaken in himself, and pass on to others, some hint, some passing impression, of what he would probably himself call the soul of things ? Time was when the barrier between these two types was held to be an absolutely impassable one. We call ours a prosaic age, but it is certainly one of its better points, and a mitigation of that prose, that those barriers hardly appear to us so absolutely impregnable as they once were. (*A Garden Diary* 177-78)

At first glance it may appear as if Lawless views the scientific attitude as masculine, but the use of "man" in the passage is generic, for human, rather than a reference to men in particular. Nevertheless, the idea of a 'Woman of Science' would probably have been alien to her, as well as to most of her contemporaries. Her mediation rather concerns two possible approaches to nature study and the possibility of combining them. In her nature writings Emily Lawless constantly returns to the idea that there is a metaphysical dimension to knowledge that remains out of reach for conventional science but is accessible to those who keep an open mind. Her view of knowledge production is democratic, with the specialist on an equal footing with the interested amateur. Before Nature, she writes

> there is no superior, and no inferior. Geologist, botanist, zoologist, horticulturist beetle-hunter, stone-breaker, weed-picker, crab-catcher it matters not what we call ourselves, or what others call us, so long as it is herself alone we follow, she receives us all alike. Within those imperial and open-doored halls of hers all rapidly find their own level; all may speak to her on occasion face to face; all present their own credentials, and all are accepted by her with the same serene, the same absolutely indifferent toleration.
>
> It is not even as if her greater secrets were reserved for the wiser and the more erudite of her followers, and were withheld from those that were less erudite, for the same partial revelations, the same profound concealments, seem, so far as can be ascertained, to be allotted to all alike. (239-40)

Making a case for alternative ways of studying and interpreting the natural world is a way for Lawless to create a place for herself in the field of natural science, but it is also an epistemological claim about the nature of knowledge. If it is equally possible for the amateur as for the trained scientist to discover facts about nature, there can be no universal scientific models that determine how knowledge should be organised, only arbitrary conventions. Although presented as a quiet reflection on the relationship between nature and the nature lover, Lawless's comment amounts to a challenge directed at professionalised science and its exclusions.

Nevertheless, the Letter to the Editor of *Nature* shows that Lawless regarded herself as capable of taking active part in more rigorous, conventional scientific study. She was passionately interested in the plants and insects of the Burren region and contributed to a fairer description of Irish flora and fauna by reporting sightings of moths and collecting plant specimens. A concern for the local characterised most natural history societies in the late nineteenth century, and their primary goal was normally to collect and display local flora and fauna as a complement to the larger collections in the Natural History Museums (Finnegan 64). A local collection was a source of pride and an expression of independence, and showed a community's investment in science and progress. Unlike most members of the local societies, however, Lawless was not content with simply labelling plants, insects and molluscs according to accepted criteria. Her brief contributions to scientific journals and projects generally adhere to scientific conventions, but in her literary works she expresses her dissatisfaction with the application of imported taxonomical models in Ireland. In particular, she questions the importance of external criteria for classification purposes and calls for a situated knowledge that is concerned with the local and particular. Her position can be compared to what Donna Haraway describes as a different kind of objectivity that is about "specific embodiment and definitely not about the false vision promising transcendence of all limits and responsibility" (582-83). Knowledge produced in this particularised manner cannot be subordinated to a universal, disembodied system.

One example of the rejection of global knowledge systems occurs when Lawless refuses to accept the current theory explaining the presence of so many subtropical plants in County Kerry because it fails "to fit entirely into *all* the facts of the case" ("In the Kingdom of Kerry" 545). Scientific botany was firmly established in Ireland by the 1820s, but Irish botanists used the British model of dividing the country into botanical localities and depended on British floras for identification (Synnott 173, 178). As a result, Irish plants were categorised according to models developed elsewhere but were not themselves used to develop the classification system – as opposed to the discovery of the lancelet fish which changed the classes of the Vertebrates. "More has been written and investigated about one single English county than about the whole of Ireland," Lawless writes, which means that the rules governing the subject are determined by conditions in England whereas Ireland remains a passive object of study ("In the Kingdom of Kerry" 552). Plants that are more common in Ireland than in England are therefore called English species, as Lawless notes in a description of a bog in the Irish west:

> With a little pains, all the British species may be found hereabouts – viz., the round-leaved sundew (*Drosera rotundifolia*), common on every marsh and boggy moor in the kingdom; the long-leaved (*Drosera longifolia*), more local, but still not uncommon; and the so-called English sundew (*Drosera anglica*), which name, by the way, is decidedly a misnomer, it being a very much less common plant in England than in either Scotland or Ireland. ("An Upland Bog" 422)

There is some foundation for Lawless's annoyance since the long-leaved sundew is mentioned in the first report of Irish plants in print, How's *Phytologica* 1650, but despite such early reports of geographical distribution, *Drosera anglica* became the recognised name (Synnott 157-58). The first British floras generally mention Irish plants only when they were rare or unusual, and an overall description of the Irish

flora did not appear until Caleb Threlkeld's *Synopsis Stirpium Hibernicarium* 1726 (163-65). The model for the first edition of *Cybele Hibernica* (1866) was Hewett Cottrell Watson's *Cybele Britannica* (1847-59) and the British manner of organising the material continued to be influential (173). Lawless was not the only one who reacted to H. C. Watson's scant references to Irish plants, and there were several attempts to correct the balance, such as Robert Lloyd Praeger's *Irish Topographical Botany* (1901) and a number of regional floras (Lysaght 448). There were also some attempts to correlate Gaelic plant names with Linnaean terminology or even coin new Irish-language names that followed the Linnaean system to imbue scientific activities with a sense of patriotism (450-52). Given her extensive criticism of classification models and methods developed outside Ireland, it is noteworthy that Lawless does not comment on the need to retain Irish plant names nor emphasise other aspects of plant lore. One reason may be that the Irish language was highly politicised at the end of the nineteenth century, and although Lawless's botanical activities were grounded in a deep national feeling, it might have been difficult to reconcile the use of an Irish terminology with her Unionist outlook.

One of the problems of organising the plants into groups according to their preferred habitats, as Lawless sees it, is that Ireland is geographically different so that areas that can hardly be described as mountainous in terms of height above the sea may be mountainous by virtue of their other qualities. This is also corroborated by the plants that grow there. Describing the Burren, she writes:

> Where else, save among mountains, do we find ice-planed rocks and toppling crags the rule, and our everyday agricultural earth a thing that exists only by sufferance, and is for the most part neatly tucked away into clefts beneath our feet? Where, again, save among mountains, are silenes and saxifrages, *Gentiana verna* and *Dryas octopetala* the vegetation of whole tracts; while buttercups and daisies, dandelions, docks and nettles are interesting botanical rarities, which require some looking for? No, the measuring tape is all very well in its own place, but its place, somehow or other, does not seem to be here! ("North Clare" 607)

Sam George shows how indigenous botany, and particularly the study of plants growing close to home, became a way for women to engage in scientific activity in the eighteenth century (7). Emily Lawless takes the concept one step further by repeatedly emphasising how Ireland is misrepresented in the current models of description and arguing that indigenous botany is a project of national importance, centrally concerned with questions of national pride and identity.

Botanical study was, however, not a priority in nineteenth-century Ireland where Catholic emancipation, tensions between tenants and landlords and the struggle for Home Rule were much higher on the agenda (Synnott 159). Botany was an elegant pursuit, connected to the Protestant gentry, and was politicised by its association with a group increasingly viewed as an extension of the colonising power (Lysaght 441). The concerns of the cultural revival of the late nineteenth century were to recover the Irish language, retrieve folklore and develop intrinsically Irish literary forms, but natural history was only very marginally included. There was a sense that botany was an alien science whose usefulness for Irish conditions could be doubted, but a more important reason was probably that the biases of linguistic, historical and literary accounts were easier to recognise and consequently more important to remedy. Lawless's position, in contrast, is that natural history is every bit as biased as cultural

expressions in the case of Ireland, and she suggests that the way plants and insects have been labelled is to a great extent a manifestation of colonial thinking:

> Our whole authorised flora is indeed to my mind an exasperating piece of business, and I can never help wishing that if it was going to be so inadequate, its inadequacy had at least taken less provoking and unlooked-for lines. With regard to two of its departments I feel a positive sense of personal grievance. Our own mountains, and our own sea! To be told that we lag behind England – flat, prosaic England – in the number of our "mountain" or "highland" plants is already sufficiently trying, but when it comes to being gravely assured by Mr. Watson that out of what he calls his "Atlantic type" we have but a miserable thirty-four plants, to Wales and England's sixty-two – Well, I can only say that I consider such a statement to be an outrage! Are we going to put up with such an invasion of our few prerogatives? Can any patriotic, any commonly self-respecting Irish botanist accept for a moment so palpably prejudiced and hostile a judgment? Let us, I say for my part, *not* accept it. Arise, botanic Celts, and glut your ire! Let us have an entirely new botany, based upon an entirely new system and classification, and let not the name of the hostile and anti-Irish botanist be so much as named in it! ("North Clare" 607)

In spite of the humorous tone, the outburst expresses a very real frustration with foreign taxonomical systems and the problem of their application in Ireland. In her view, the discipline of botany has been insufficiently translated from a cultural point of view. The result is a situation where, as Michael Cronin describes it, the "commercial and technological needs of standardisation from the centre" are in conflict with "notions of cultural suitability on the periphery" (96). But to demand an entirely new botany is hardly practical, and since Lawless uses both the Linnaean system and Watson's English flora she tacitly acknowledges the necessity of a common language. At the same time as she criticises Linnaean taxonomy and English-made rules of botanical study she continues to transmit standardised knowledge in popular form. These contradictory activities can usefully be understood as an instance of what Cronin terms "translation ecology," or a practice where minority language users control what, when and how texts are translated into and out of their languages (167). Translation from a dominant culture to a minority culture may easily be seen as an act of oppression, as Lawless's criticism of Watson's inadequate plant groups exemplify, but translation from the minority to the majority may function as a kind of appropriation where linguistic and cultural material from the periphery is simply subsumed to the formats of the metropolis with the result that its uniqueness is lost. The result is a double bind where ethical translation becomes virtually impossible. As Gayatri Spivak points out, however, it is impractical to endlessly "defer action until the production of the utopian translator" (399). Since communication is the goal of any meaningful translation activity, some common ground needs to be established and this requires translation traffic that moves in several directions, regardless of the access to power of the knowledge-producing communities. In a translation ecology, Lawless's contradictory practices exemplify how the decision of how and what to translate and how to relate to the translated text does not require faithful transmission of an original but is based on negotiation, subversion and pragmatic choice.

Discussing American women's nature writing in the nineteenth century, Karen Kilcup wishes to demonstrate a "synthetic vision" which makes these women "more likely to regard nature in the context of gender politics or struggles for amelioration than as a separate political or cultural concern" (46). Although Lawless signed "An Appeal Against Women's Suffrage" in 1889 and can hardly be regarded as a feminist, it makes sense to read her meditations on a different kind of science in the light of turn-of-the-century gender debates.[4] It also makes sense to view her stylistic strategies and choice of unscholarly genres as effects of late nineteenth-century gender codes that denied her access to the professional world of science. Her nature writing is a site of negotiation, where the Woman Question, Irish Home Rule, established scientific models and unconventional paths to knowledge collide. She seems to advocate a partial perspective where knowledge is locally produced, but in the end, she accepts the need to use standard terminology, despite its shortcomings. Using Linnaean taxonomy and British plant recording models in Ireland may not be ideal, but it is practical, and using popular forms to transmit new ideas about knowledge is a way to avoid open confrontation with the scholarly establishment. As in any translation and negotiation situation, her contradictory ideas do not fuse and form a new whole, but the traces of both positions – or language systems – are simultaneously present in her texts.

Notes

1. Personal, reflective nature writing should not be understood as a female genre in essentialist terms, but rather as the opposite end of the spectrum from the ideal governing scientific treatises, a genre which was almost exclusively used by men in the nineteenth century.

2. See, for instance, "An Addition to Mr. Birchell's List of 'The Lepidoptera of Ireland," "Florentine Gardens in March," "Irish Captures in 1870 and 1871," "Irish Memories – West and East," "Some Mothing Memories," "Two Leaves from a Note-Book," "An Upland Bog.". Lawless's interest in nature studies is apparent in most of her writing, however, not only in texts directly concerned with botany etc.

3. Lawless does not mention Darwin's name in the article, but refers to her correspondent as "a great, nay greatest, zoologist; greatest of our age one may surely say, without fear of contradiction, of any and of every age" (605). In the 1860s and 1870s Darwin was working on questions to do with plant fertilisation, publishing *The Effects of Cross- and Self-Fertilisation in the Vegetable Kingdom* in 1876. His letter to George John Romanes where he mentions an essay on plant fertilisation written by Lawless also suggests that he was the letter-writer (Ethel Romanes 58).

4. Lawless's name appears on page 786.

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Review: Ebury on Ben-Merre: 74-75

David Ben-Merre, "'What Points of Contact Existed Between these Languages?': James Joyce, Albert Einstein, and Interdisciplinary Study." *James Joyce Quarterly* 47.1 (2009): 25-49

David Ben-Merre's useful article offers three things: a careful appraisal of the value of interdisciplinary endeavours; a summary of recent work on science in the work of James Joyce; and finally an original close reading, which he feels will escape the problems that he raises in the earlier sections. The first section on the attractions and pitfalls of work that crosses disciplinary boundaries will probably be most interesting to a general (non-Joycean) audience; in particular, he has a great deal to say about the problems of language and terminology which occur when two disciplines are brought together. As he points out, scientists criticise the way that in literary criticism "scientific concepts are often misunderstood and intentionally or unintentionally misapplied" (30), giving the example of 'nonlinearity' as a term which is not always used correctly but which Ben-Merre feels can still do valuable work. Such examples highlight Ben-Merre's sense of the impossibility of a perfect marriage of disciplines which he calls an ideal "happy ending where both disciplines come together as one" (33).

Ben-Merre's opening discussion is also highly attuned to the difficulties thrown up by the 'Two Cultures' debate for work addressing both literature and science, suggesting that as a result of this, "it seems impossible to define the humanities without setting up science as their opposites" (30). (He describes the infamous 'Sokal Hoax' as a manifestation of the continuing difficulties of disciplinary rapprochements). He worries that our critical interest in bringing literature and science together (which, as he points out, is not shared by scientists) may reflect an anxiety that the humanities may not be serious enough. If this is true we might wonder whether a greater turn towards interdisciplinary work will be our compensation for the pressure that the arts and humanities are currently under in the UK. Despite the problems of interdisciplinary study which Ben-Merre identifies, he still makes a strong case for the appeal of such work.

He then assesses recent forays into interdisciplinary study by Joyce critics which demonstrate the various ways in which the philosophical implications of physics correspond to literary aspects of Joyce, including work by Thomas Jackson Rice, Philip Kuberski, Peter Francis Mackey and Michael Patrick Gillespie. He suggests that such studies, however enlightening, also sometimes "serve as examples of how interdisciplinary studies can delightfully err" (28) in certain crucial ways, through misappropriation, internal inconsistency or an excessively humanistic focus. He also implies that the critical choice to apply later science such as chaos theory to Joyce's works (as if scientists, to paraphrase Ellmann, were still learning to be Joyce's contemporaries), instead of the science of Joyce's day, such as relativity and early quantum theory, leaves much valuable work unattempted. As he puts it, "Einstein might offer a [literary] model even more radical than chaos theory" (33). However, surprisingly, given Ben-Merre's sense of the need for a fresh perspective, his article does not refer to more recent Joyce criticism such as that of Andrzej Duszenko on Joyce and the new physics or Jeff Drouin's genetic work on relativity and modernist

print culture. Such work does in fact address the status of Einstein in Joyce and arguably evades some of the problems that he identifies in this essay.

To demonstrate Einstein's radical potential Ben-Merre then turns to the 'Ithaca' chapter of *Ulysses* and makes his own attempt to surmount some of the difficulties of interdisciplinary study. He uses what he calls a "metaphorical method" (36) using Einstein's famous formula $E = mc^2$ as a way of breaking the chapter down into discussions of Joyce's representation of energy, mass and the speed of light, thereby explaining 'Ithaca' and relativity simultaneously. This approach works particularly well with 'Ithaca', a naturally interdisciplinary chapter, where Joyce parodies the rhetorical style of scientists, subsuming more human concerns in the deliberately dry form of 'mathematical catechism'.

This essay is both an elegant and worthwhile discussion of the nature and role of interdisciplinary work and a valuable piece of criticism on *Ulysses*. As Ben-Merre sums up his article, "The focus in my metaphoric excursion has been on peripatetic-thematic wandering, meta-critical wandering, and interdisciplinary wandering" (43) – and his journey is well worth following.

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Review: Hunter on Inglis: 76-77

Katherine Inglis, "Opthalmoscopy in Charlotte Brontë's *Villette*." *Journal of Victorian Culture* 15.3 (2010): 348-69

Katherine Inglis's intelligent article maximises her scrupulous research into nineteenth-century opthalmoscopy to advance a reinvigorated reading of the language of sight in *Villette*. Inglis eschews the arguably worn themes of vision and surveillance, drawing attention instead to the ways in which Brontë engages with the phenomenological experience of sight and nineteenth-century understandings of the embodied eye. This critical refocus facilitates an argument of real theoretical weight. The article's disquisition into *Villette*'s dialogue with Victorian optics makes a significant contribution towards moderating the enthusiasm with which, in some quarters, theories of panopticism have been applied to nineteenth-century literature. It demonstrates comprehensively that Jeremy Bentham's theory of the Panopticon was but one of several discourses of vision current in nineteenth-century thought.

The main historical contexts underpinning the article are the significant advancements in optical technology and medical knowledge which had, by the mid-nineteenth century, given rise to a new understanding of the human eye. Innovations such as the opthalmoscope, invented in 1850 by Hermann van Helmholtz, facilitated a deeper understanding of the eye and promoted new awareness of its imperfections and fallibility as a sensory organ. Inglis locates *Villette* in an associated climate of growing scepticism about the power of the human eye, and shows the novel to be implicated in the development of this scepticism. As she herself admits, she is not the first Brontë scholar to draw attention to the influence of nineteenth-century optics on this novel; she gives due credit to Heather Glen's *Charlotte Brontë: The Imagination in History* (2002). Glen has highlighted Brontë's emphasis on the physiology of heroine Lucy Snowe's faulty perception; Lucy is often confused or overwhelmed by the inability of her eyes to process and sort the impressions which assail them. Although Inglis acknowledges her debts to Glen, she advances a bold and independent argument. Contextualising Brontë's emphasis on sight as struggle in the specifics of contemporary optometry leads her to question Glen's emphasis on Lucy's passivity. For Inglis, Lucy's dazzlement brings her power as well as pain, enabling her eventually to evade the systems of surveillance at Madame Beck's *Pensionnat*.

Inglis's cogent argument is structured around three nineteenth-century instruments designed, as she puts it, "to look into, perforate, and enhance the human eye" (352): the opthalmoscope, the stylet and Monsieur Paul Emmanuel's spectacles. The opthalmoscope created a close and intimate relationship between examiner and examinee which, Inglis persuasively claims, Brontë uses as the model for visual relationships in *Villette*. The characters in the novel are often configured as examiner and patient, staring into each others' eyes and inflicting mutual damage with light rays. Surveillance is "unable to withstand the destructive, transformative effect of this proximate gaze" (360). The intensity of proximity, Inglis observes, is figured through a textual concern with embodied marks. She traces this concern to the stylet, by which name both a nineteenth-century surgical instrument and writing implement were known. The optical device with the most complex connotations, however, is Paul Emmanuel's pair of spectacles. This commonplace item profoundly complicates the patterns of vision and power at play in the novel. The glasses, as Inglis explains, "represent Paul's unique ability to move between systems of optical control, to survey

and withstand surveillance, to dazzle without fearing that his look might be returned, to see *through* as well as survey" (363).

Paul Emmanuel's spectacles are integral to Inglis's refreshing claim for Lucy's acquisition of agency. She shows the moment in which Lucy accidentally smashes Paul's glasses to initiate a climax in which the heroine is liberated from both the proximate stare and surveillance. Strengthening her thesis by adroit comparison with the recovery of Rochester's sight at the end of *Jane Eyre*, Inglis suggests that the optical pain and confusion Lucy suffers are incorporated into a therapeutic narrative, in which "Pain brings clarity, transparency supersedes opacity, and intervention restores agency" (367). Lucy's climactic breakdown in front of Madame Beck may well owe as much to the poetic culture of lachrymosity epitomised by Tennyson's "Tears, Idle Tears" (1847), as to optical surgery. Nonetheless Inglis's scientifically-inflected recasting of Lucy as survivor is plausible as well as beguiling, and allows her to move beyond stale disagreements about the novel's ambiguous ending. The real point, Inglis seeks to convince us, is not whether Paul Emmanuel has survived the shipwreck but that Lucy Snowe has survived her perceptual weaknesses to narrate her story. This original handling of a well-known literary conundrum makes the article an exciting new addition to the field.

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Review: Read on Munroe: 78-79

Jennifer Munroe, "'My Innocent Diversion of Gardening': Mary Somerset's Plants." *Renaissance Studies* 25.1 (2011): 111-123

This article seeks to demonstrate how the work of Mary Somerset, first Duchess of Beaumont, "blurs the line between 'gardening' and the twin fields of horticulture and botany" (111), and to place Somerset in a proper context as a serious documenter and collector of plants. Jennifer Munroe argues that Somerset's work "was an endeavour that crossed over into what we might see as more than just plant collecting and is indicative of scientific thinking about plants as well" (111).

Munroe argues throughout her article that Somerset has been consigned to the footnotes of botanical history despite being accepted as an authority by her peers. Beaumont was in regular correspondence with Sir Hans Sloane, James Petiver, William Sherard, Robert Southwell, and Jacob Bobart, all fellows of the Royal Society (113). This does, as Munroe suggests, imply that, "despite her marginalisation from the annals of science, Somerset was clearly part of the inner circle" (114). It seems that Somerset did not seek the publication of her copious notes and observations; she did, however, arrange for her twelve-volume herbarium to be bound to preserve it. She also seems to have taken measures to ensure that the information in these volumes was as accurate as possible, asking Sloane to check them before they were bound, writing to him on one occasion to thank him for giving her feedback and saying:

> I will have loose papers put into the booke wth those names, I think belong to them if you will bee troubl'd wth them, to see the faults before they are in the booke, to send it to you, it being pitty to have them after so much charge to bee false nam'd w^{ch} may easily done by mee, most of them being rais'd by seed w^{ch} came wthout names. (119)

The letter not only thanks Sloane for the trouble he has gone to in checking her volumes, but also offers a reason for any misnaming of specimens. Somerset took great care over not just the content of the volumes but also in how they were to be bound, as letters from her amanuensis make clear (120). In due course, Somerset was to bequeath the twelve manuscript volumes to Sloane and they still remain in the Sloane holdings at the Natural History Museum (119).

Somerset's interest in gardening and collecting plants meant that her main interest in her husband's seat of Badminton seems to have been in planning an ambitious garden. This Munroe argues, "demonstrates that she [Somerset] was invested in making a bold architectural statement with the plants she grew that would be as memorable as the architecture of the house her husband maintained" (112). Indeed, household accounts suggest that by 1690 Beaumont had spent almost £30,000 on the gardens. What differentiates Somerset from other privileged women with an interest in plants, Munroe argues convincingly, is the systematic way in which Somerset recorded her findings. Her notes further show that she had an interest in the performance of plants beyond how they did at Badminton.

Munroe suggests that one of the reasons Somerset's place in the history of botany has been minimised is her humility. As the title of this essay shows, Somerset referred to her "innocent diversion of gardening" in a letter to Sir Robert Southwell in

1694 (111), and this, for Munroe, is "surprisingly humble" (111) and belies the significance of the work Somerset undertook. Munroe similarly feels that the response to Sloane, cited above, is also "a humble stance" (119). However, the tone that Somerset adopts in her correspondence is typical of the polite discourse of many women writing in the period, and does not really suggest that she is in any doubt about the significance of her work. Indeed, in the extract offered from her letter to Sloane, Somerset makes it clear that the reason she might have misnamed some plants is not because of carelessness on her part, but rather that they were sent to her, possibly by Sloane and another eminent contemporary collector, inadequately labelled. It is the case, as Munroe suggests, that, by compiling such a careful and detailed herbarium, Somerset did, in fact, declare "her horticultural endeavour as more than just an informal pastime" (123). One of the intentions of this article is to raise the profile of Mary Somerset, first Duchess of Beaumont as a botanist, and this is evidently necessary, for it is clear that Somerset's contribution to the emergent science needs to be acknowledged more broadly.

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Review: Rogers on *Isis* Issue: 80-83

James J. Bono (ed), "Focus: History of Science and Literature and Science: Convergences and Divergences." *Isis* 101.3 (2010): 555-598

This timely focus section from *Isis* explores the shared interests between the fields of the history of science (the home discipline of *Isis* itself) and literature and science. James J. Bono's introduction to the issue provides an interesting historical context to discussions of literature and science in *Isis*, explaining that in some respects this is a (long-overdue) response to an *Isis* article written in 1978 by G.S. Rousseau, who glumly predicted the death of science and literature studies. As the rumours of that demise have been greatly exaggerated, Bono responds, it is time that historians of science sit up and take notice of the many grounds on which their work connects to that of literary scholars. In particular, Bono argues that the history of science and science itself can be seen to be 'making' knowledge in a way that is similar to literary forms of 'making', or *poiesis*, bringing it back to the Greek etymology of poet as 'maker'. For Bono, scientific making is "the making of the different forms of knowledge of things and events in nature", which puts it in a realm where there is little distinction between "discourse and (material) practice or, to put it differently, between text and action" (557-558). This is the framework, then, of the four essays that make up the special issue.

Colin Milburn's article "Modifiable Futures: Science Fiction at the Bench" opens the discussion with a suggestion for conceptualising the ways that science fiction can be said to "influence" science, which directly addresses the question of what literary studies might do for histories of science. For Milburn, if we consider scientists themselves as a kind of fan culture (even indirectly; he is not suggesting that all scientists read science fiction), we can imagine science fiction impacting on scientific communities and therefore on the history of science. Milburn asks us to change our perspective – and our language – regarding the assumption that science fiction can 'nfluence' or 'infect' science, which tends to imagine an active and invasive literary authority (often figured as an author who is credited with agency or 'influence'). Scientists themselves, Milburn suggests, should be attributed with their own authority in relation to science fiction – similar to fan-based creative work called 'modding', wherein the primary texts of a genre are re-imagined and rewritten by their cultural consumers. He provides a very helpful template of three primary effects that this kind of modding can produce in the professional work of science: blueprint mods (scientist using basic ideas and concepts taken from sci-fi), supplementary mods (scientists substituting viable ideas for impossible ones in sci-fi) and speculative mods (scientists discussing future applications of current science in a speculative or imaginative way, especially in discussion sections of research papers or in popular books and other media). The place where we end up in this approach, with speculation and even fiction-making in regard to the future, resembles the previous model of 'influence', but with the key difference in that the scientists are the actors, not the acted upon, in relation to the genre of science fiction.

In the next essay, "Science Surveys and Histories of Literature: Reflections on an Uneasy Kinship", Laura Otis begins her article by exploring the common grounds between two subcategories of the history of science and literary studies identified in her title. Both approaches, she suggests, share an interest in origins, a "longing for

truth", and both construct and interpret narrative to find that truth, with the somewhat circular result that stories "are actively made" in the course of the history of science. She modifies what might appear to be a radically relativistic approach, noting that "knowledge about the past [that] can be accessed only through fictions does not exclude the possibility that truth exists or that valuable knowledge can be secured" (573). However, the nature of that truth may be very different, Otis warns, chiefly in the way that literary studies seem to "celebrate" interpretative differences, and historical studies are uncomfortable with those differences – much like the sciences themselves. Towards the end of her analysis, Otis's view takes an interesting and important turn towards the cautious in a way that leads to her conclusion, reflected in her subtitle, that the "kinship" between historical and literary approaches to science will always be somewhat "uneasy". Still, as a discussion of the relationship between the two professions, Otis does a good job of sketching the grounds of commonality without presenting a reductive view of our professional kinships; her observation that each discipline has a contested authority due to "a troubled relationship with the people practicing or creating its objects of study" is an important point (575). Indeed, overall her article respectfully warns against over-casual assumptions of merging the perspectives of the two fields.

Otis suggests that literature is somehow not as historically determined as science (in that a piece of literature, even if produced in a historical past, is experienced in the present by contemporary readers), which is largely a valid observation, but I think she rather overstates the case; she comes close to suggesting that it is no longer methodologically acceptable amongst literary scholars to think about (or teach) histories of literature; scores of undergraduate courses say otherwise.

Curiously, there seems to be a subtle conflict between Otis's position and that of Laura Dassow Walls's essay, "Of Atoms, Oaks and Cannibals; or, More Things that Talk", which comes at the end of the Focus section. Whether this is by design or accident is hard to tell – Bono makes no reference to it in his introduction. While Otis suggests that literary scholars are uncomfortable with historical lineages of literature, Walls begins her article by suggesting that the *Norton Anthology of English Literature* – a historical survey if there ever was one – is the archetypal engagement of academia with literature, and that it is an unsatisfactory one. This "curatorial model of literary scholarship", she suggests, only see texts as decontextualised, silent objects "detached from the human experience": "literary scholars", she goes on to assert, "are still uneasy with natural things, the nonhumans whose lives and processes exist outside language and culture" (590, 593). Walls's intention is to promote a literary methodology that posits texts as "performances that weave together discursive and material elements" (590). She argues for a more "entangled" approach that recognises the text as a "thing that talks" or, a cultural or natural artefact as well as literary artefact, in the way of the historian of science. Walls is quite right about recognising texts as "things that talk", but literary scholars, especially scholars of early texts, already have a long tradition of recognising texts as "talking" objects. The evocation of the *Norton Anthology* is a bit disingenuous: yes, it is historically constructed with all the individualised texts decontextualised for the purposes of establishing the literary history. But the *Norton* and its sister anthologies are not intended to be the definitive, primary, or dominant means of literary engagement in the entire field: they are a tool, and undergraduate teaching tool, and really no more. They serve a (very important) purpose in providing a sampling of the kinds of literature available for study, intended to tempt the new reader in the field. From there, scholarly approaches to literature are expected to move on to editions that *do* work to contextualise

literature within its social, cultural and natural provenances: that is the work of the more advanced, and then professional, literary scholar, who cannot be said to "kill" and "stuff" the "earth's multifarious and imperilled beings" with metaphor in order to erect them into dioramas of human life", as Walls puts it (594). (Walls seems to occasionally conflate or confuse writers of literature with scholars of literature: it's hard to say who she is accusing of literary taxidermy in the following passage – the poets or the critics.) In the end, Walls's conclusion also seems to contradict that of Otis, who cautions against reducing the history of science and literature and science to the same scholarly gestures. "Nothing but habit", asserts Walls, "sustains the 'two cultures' divide . . . historians of science and literary critics who work in view of each other need now to join forces, to multiply our relations, and thereby join the task of building a Cosmos together" (598). Leaning somewhat more towards Otis's perspective here, I am inclined to think that the differences between the two disciplines are a bit more than habitual, but I take Walls's point that we should check our herd instincts wherever possible, and work to narrow the divide.

Henry S. Turner's analysis of literary form is just the sort of work that might accomplish that goal. This article "Lessons from Literature for the Historian of Science (and Vice Versa): Reflections on 'Form'", is a clear-headed and courteous introduction to a helpful literary tool – the analysis of literary form. Turner demonstrates that formal analysis is an example of literary methodology that might assuage the anxieties of both Otis and Walls; form is an important dynamic force in texts that engages with historical context and also makes the text live, or talk, as Walls might say. Turner's attempt to bring it to the attention of historians is important in its own right, but just as important is the very fact that he has taken on the challenge of defining literary form – a project that many literary scholars tend to be skittish about doing, even while acknowledging the importance of the subject. The reason for this is that form actually manifests itself in several different ways, many of which overlap with each other, as well as with the non-formal aspects of literature. Like anything important, form resists standing and being counted, yet Turner's brave attempt at a taxonomy of form is quite successful.

The four categories of form that Turner comes up with are of necessity a bit arbitrary, but they cover a lot of ground. They range from micro to macro levels of form: stylistic form, structural form, material form, and social notions of form. The boundaries are blurriest at either end of the range; stylistic form, including "various kinds of verbal patterning" and "poetic" language is difficult to detach from "style", which surely deserves its own methodological identity (580). But Turner is correct in pointing out that stylistic elements *do* involve form: the zeugma and chiasmus provide simple examples; they are stylistic devices that have specific formal requirements (the structure of their constructions), so they have a foot in both worlds. Similarly, at the "macro" level of form Turner describes forms that are "not textual in the narrow sense of the term" but are usages that come from "outside of literary criticism properly speaking and [are] especially typical of certain strands in philosophy, history, anthropology and sociology" (581). This category is most unstable, although it is a useful attempt to impose some sort of tangible existence on what it usually an intangible and fluid relationship between text and society. In many respects, I think this is the category that would most interest historians, although I would advise using it as a point to work back from into the more traditional understandings of form – what Turner calls the structural and material forms of texts. Structural forms are things like plot, poetic form and dramatic scenes; material forms are things related to material book culture (and now, digital culture), such as codicological information,

paratexts, publication history and other physical design aspects of the textual presentation. All of these forms of text are potentially important to historians of science, as is the general principle of form being perceived "as a verb rather than a noun . . . an active relation among significant parts that are apprehended through a transaction between the artefact and its readers, viewer, listeners, or speakers" (582).

Turner's article addresses most directly an underlying direction of the Focus section as a whole; because *Isis* speaks to the history of science community, there is a "sales pitch" subtext to the special issue. Presumably, at least some of the core readership is imagined to be requiring an explanation as to what literature and science research has to offer their history-based discipline. It is important that disciplines ask these questions of each other, and this issue provides some good answers. Yet the pressure of the challenge to justify the work of the literary critic seems to produce a certain tendency towards hyperbole in some of the opening sentences. Otis begins with the somewhat strange (and arguable) observation that "A survey course on American Literature from 1865 to 1945 is rarely called a "History of Literature". (570) True, but the national and temporal designation is surely more a matter of clarity than ideology. Walls's somewhat overly dramatic entry into her argument reads: "To troll the pages of the Norton Anthologies of Literature is to be invited to think of stories, essays and poems, displayed as they are in like paintings in a museum, as separate and single works". "Trolling" a series of texts would surely invite the kinds of shallow and disconnected interpretations that she then goes on to accuse some literary scholars of – what if we actually *read* them? And finally Milburn oversteps the mark a little with his sonorous "Science Fiction: the very concept appears as a monstrous violation of categories". Still, enthusiasm should not be faulted too much in this laudable attempt to encourage interdisciplinary engagement between historians of science and literature and science scholars.

Overall, the issue reads well: Turner's articulation of form as "a verb rather than a noun" – an activity or even energy – encapsulates a common message between all the essays in the focus section – the idea that historical and literary research in science must recognise and represent the vitality of their subject, science, as well as their own work – 'vitality' literally, as in a living thing. This draws us back to Bono's framing statements on the shared interest of historians and literary critics in the "poetics of science"; the recognition and even the celebration of the work of "making" or *poiesis* in the scientific process, and in the historical and literary engagements with that process (559).

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Review: Sabatini on Furniss: 84-85

Tom Furniss, "A Romantic Geology: James Hutton's 1788 *Theory of the Earth*." *Romanticism* 16.3 (2010): 305-21

In "A Romantic Geology," Tom Furniss deftly analyses James Hutton's *Theory of the Earth* and suggests its influence on Romantic poets such as Wordsworth and Coleridge. The author thus explores the fascinating "interplay between geological speculation and the aesthetic experience and theory of the sublime." (305) More precisely, Furniss claims that Hutton's theory could be considered as "Romantic" because, on the one hand, it provides a Wordsworthian representation of nature and of the Earth and, on the other, it reveals what Noah Heringman labelled as "geological sublime", i.e. " a geo-category that was common to the aesthetic geology and geological aesthetics of the period and that impacted on the first generation of Romantic poets." (307) By connecting Hutton's geological research with the philosophical notions of space, time and nature expressed by Romantic poets, Furniss specifically puts forward the mutual and fertile relationship between science and literature in "Romantic culture," so as to reflect on the prominent and less-explored influence of scientific progress on Poetry: "what we call 'Romantic science' cannot be seen merely as the backdrop or foil to Romantic poetry but as *part of a much more extensive Romantic cultural formation* that has more continuities with the Enlightenment project than is usually recognised." (307, my emphasis)

In the first section of the article, Furniss presents James Hutton as the founder of modern geology and provides a meticulous and remarkable description of the research that brought Hutton to the composition of his 1788 paper *Theory of the Earth*, which later became the starting point for a more ambitious two-volume work called *Theory of the Earth with Proofs and Illustrations*, published in 1795. The article proceeds through careful close readings of Hutton's original text and explains all the crucial passages that shaped his then highly innovative study. According to this, the Earth was a complex living organism whose materials were not inert but set in continual vital motion, as in the instances of electricity and magnetism, two natural powers that significantly anticipate "Coleridge's and Wordsworth's assumption that nature and/or matter has inward *powers*" (309, Furniss's emphasis). Subsequently, Furniss underlines Hutton's analysis of the circulatory systems of water and air. These create an eco-system that both sustains life on Earth and destroys it by means of the relentless process of erosion it activates. In this respect, Furniss pertinently quotes a passage from Hutton which prominently connects to Romantic Poetry and epistemological inquiry: "[T]hose travelling materials are still pursued by the moving water, and propelled along the inclined surface of the earth. These moveable materials [are] delivered into the sea . . . [and] carried farther and farther along the shelving bottom of the sea, towards the unfathomable regions of the ocean" (310). The adjective "unfathomable" appears here as the semantic vehicle that triggers Furniss's main claim about a plausible comparison between Hutton's theory and the romantic concept of the sublime.

In order to better elucidate such a relationship, Hutton's analysis continues by thoroughly expounding Hutton's geological theory, i.e. his ideas on the Earth's capacity to restore and repair itself and, more poignantly, his then extra-ordinary discovery that "many of the earth rock materials, such as granite and basalt, were formed by subterranean heat and pressure" (311), a postulation that made "a

significant contribution to the development of modern geology" (311). In such an innovative view of geology, all the materials on Earth continuously flow and circulate, and the Earth itself is described as a complex body with "internal self-powered circulatory systems that allow to repair and renew itself" (312). In this light, Furniss underlines Hutton's study on volcanoes by underling a relevant ambivalence. Firstly, Hutton claimed that volcanoes were "safety valves" for the Earth and part of those natural (geological) elements that provide "intellectual stimulation and aesthetic pleasure to human beings": a "beautified" and benign representation of nature that relates, in Furniss's view, to Wordsworth's notion of Earth as an "unfallen paradise" in the opening lines of *The Prelude*. Secondly, Hutton asserts that, although beautiful and designed to sustain life, nature "maintains these conditions through the deployment of enormous subterranean power that is often destructive and terrifying and therefore always, in Burkean terms, potentially sublime" (314).

Furniss's consequent argument revolves around Hutton's depicting of a "geological sublime" achieved through a profound reflection on nature's "dark abyss of time". In Hutton's theory, as Furniss argues, human beings appear "insignificant in comparison with the sheer power of the Earth's internal forces and the inconceivably long duration of the Earth" (314). In this respect, Furniss quotes significant passages by Hutton which clearly explain the sublime and ineffable nature of geological processes, and he skilfully takes into account the "infinite, unthinkable time-scale needed for [the] infinitesimal natural events to produce and reproduce the Earth's geomorphic features" (315). Although the article would have benefited from some more specific close-readings of Romantic poems (in order to better define and ground the comparison with Hutton), it undoubtedly represents a significant contribution to the study of the relationship between science and literature in the Romantic Age: Furniss proposes an original connection between geology and poetry, a connection that surely merits further investigation.

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Review: Swain on See: 86-87

Sam See, "The Comedy of Nature: Darwinian Feminism in Virginia Woolf's *Between the Acts*." Modernism/Modernity 17.3 (2010): 639-667

In 'The Comedy of Nature,' Sam See delights in phrases such as "Woolf's campy cows," and "Woolf's concentrated camp" whilst discussing degeneration and atavism in relation to Hitler's Nazi regime (658). It is a clever engagement with ideas See describes in *Between the Acts* as "simultaneously humorous and disturbing" (643). While *Between the Acts* may get away with being a "strange concatenation of humour and horror" (642), one wonders if it is insensitive of the critic to have fun with campy concentration, while considering ideas of concentration camps.

Of course Woolf's rejection of the human tendency to "sanitise death" (652) and her rejection of Hitler's extreme sanitisation, genocide, forces the characters in *Between the Acts* and, with them, the reader, to face the uncomfortable. From defecation to "f—ing" to death, See asserts, Woolf *forces* discomfort because these are biological truths (652). However, the examples See cites are rare occasions in Woolf's writing, which is often characterised as aristocratic. Indeed, Woolf was disgusted by the realism of *Ulysses*, and wrote the following in her diary: "An illiterate, underbred book it seems to me: the book of a self-taught working man, & we all know how distressing they are, how egotistic, insistent, raw, striking, & ultimately nauseating". Again, later in her diary, she wrote: "The pages reeled with indecency. I put it in the drawer of the inlaid cabinet." While See references Woolf's few forays into uncomfortable, gritty writing, he admits she redacts a word in her diary so it is written as "p—p". Woolf cannot bear to write directly about defecation: the forcing of biological truth seems as discomfiting to the author as to her readers.

One of the cornerstones of the article is See's analysis of 'camp', both in Woolf's work and in the critical practice of the article. See argues initially that 'camp' is a category which "resists definition" (644), which may explain why it is so freely and flexibly used throughout his analysis of *Between The Acts*. The idea of camp is applied broadly, and can seem difficult to pin down in its resistance of definition. See rejects Susan Sontag's statement that "Nothing in nature can be campy" by effectively arguing that it is nature itself in *Between The Acts* that is 'camp'. Later, See argues that "to be good with bad aesthetics [is] a definition of camp itself" (645) which adds to the complex understanding (or challenge to understand) this particular consideration of camp. The free use of 'camp' in "The Comedy of Nature" could be considered a strength, because See argues for a similar complexity of camp in *Between The Acts*, but this aspect of the article may unsettle the critic who looks for solidity.

Adding a further layer to this complexity, See argues that Woolf considers her use of 'camp' as feminist, and that this can be defined as a Darwinian feminism because Woolf saw Darwin's theories as misogynist. See explains that Woolf "characteristically described humour as women's best weapon against such forces" (645) as war and fascism, and she therefore "camps sexual selection" in *Between The Acts* by using parody (645). This parody then acts to subvert Hitler's misuse of Darwinian theory. If camp, with its subversive degeneration, is "simultaneously humorous and disturbing," (645) does Woolf's female weapon of humour work in the same way? See convincingly argues for Woolf's use of uncomfortable humour in

Between The Acts. Intimate detail is animal, or natural, which then (by some definitions) can be considered atavistic or 'camp'. The feminine is traditionally considered closer to nature. One is tempted to begin drawing charts to clarify the interrelationship of ideas. Can camp, or queer, or homosexual, *be* feminine? Can camp be natural in its unnaturalness? A final reading introduces the idea of failure. La Trobe, a main character in *Between The Acts,* is "a camp failure" (657), directing "a play whose camp failure yields the audience's public intimacy" (656) and thus a successful pageant.

Though See's arguments for mutability and subversion in his examination of 'camp' allow for flexibility, relating these to Darwinism and failure is a harder sell. Because *Between The Acts* is a subversive text, then the play within the novel, and the campy character directing the play, are successful failures. But in Darwinian terms, failure does not propagate. And in biological terms, it can be argued, queerness cannot propagate. See certainly tackles a complex succession of ideas in "The Comedy of Nature" with a great deal of success. However, the very mutability of the ideas discussed means that the arguments are, like camp itself, not always entirely transparent.

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