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‘Free, Bold, Joyous’: The Love of Seaweed in Margaret Gatty and Other Mid-Victorian Writers

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ABSTRACT

With particular reference to Gatty’s *British Sea-Weeds* and Eliot’s ‘Recollections of Ilfracombe’, this article takes an ecocritical approach to popular writings about seaweed, thus illustrating the broader perception of the natural world in mid-Victorian literature.

This is a discursive exploration of the way that the enthusiasm for seaweed reveals prevailing ideas about propriety, philanthropy and natural theology during the Victorian era, incorporating social history, gender issues and natural history in an interdisciplinary manner.

Although unchaperoned wandering upon remote shorelines remained a questionable activity for women, ‘seaweeding’ made for a direct aesthetic engagement with the specificity of place in a way that conforms to Barbara Gates’s notion of the ‘Victorian female sublime’. Furthermore, while women’s contributions often received an uneven reception within the masculine institutions of professional science, marine botany proved to be a more accommodating area for participation.

At Ilfracombe, Eliot wrote that she believed collecting and naming was a means to achieve distinct and definite ideas in her understanding of the world. The argument is developed that many needed to reorient their personal cosmologies in order to make sense of, and impose meaning upon, an uncertain world, thus contributing to the great debate about evolution.

KEYWORDS

Environmental history, nineteenth century, marine botany, women

In 1848 Margaret Gatty had a chance conversation with her doctor about seaweed. This took place while convalescing from physical exhaustion in Hastings, a consequence of frequent pregnancy.¹ The discussion was the origin of an absorbing passion for shore hunting, and Gatty retained her zest for algology

and indeed all natural history until her death in 1873.² As a case study, Gatty, the prominent Victorian children's writer who produced *Aunt Judy's Tales* and *Parables from Nature*, gives much insight into the fashion for seaweed collecting, a perhaps unlikely instance of mid-Victorian biophilia (the human affinity for living things). However, Gatty, author of *British Sea-Weeds* (1863), was but one of many authors, several of them women, who collected and published on marine botany during the mid-nineteenth century. Besides renowned male contemporaries who participated in the shore hunting phenomenon, such as Philip Henry Gosse, George Henry Lewes and Charles Kingsley, there were popular contributions by Elizabeth Anne Allom (*The Sea-Weed Collector*, 1841), Isabella Gifford (*The Marine Botanist*, 1848), Anne Pratt (*Chapters on the Common Things of the Sea-Side*, 1850), and Louisa Lane Clarke (*The Common Seaweeds of the British Coast and Channel Islands*, 1865).³ In 1856, George Eliot contemplated the way in which the process of identifying species of seaweed helped her to make sense of the world in journal entries entitled, 'Recollections of Ilfracombe'.⁴

Among such diverse writings, I examine in detail several specific contexts of engagement with the natural environment apparent within texts about marine botany. Books such as Gatty's *British Sea-weeds* frequently express an exuberant and sensual celebration of immediate material existence accompanied by effusive descriptions of aesthetic pleasure and a keen sense of place. Following Ann Shteir's *Cultivating Women, Cultivating Science*, an account of women's botanical pursuits at a time when natural history was defined as a 'gentlemanly avocation', the present essay considers the acceptance of contributions by algologists such as Amelia Griffiths when science in general was held to be predominantly, indeed often exclusively, a masculine endeavour.⁵ Women participated in seaweed collecting on terms that both contest and conform to prevailing notions of the separate spheres. There follows a discussion of the comforting proposal that moral improvement could be attained through the study of natural theology on the seashore, exemplified, for example, in the writings of Anna Pratt and Isabella Gifford. However, this culminates in an exploration of the way in which the contemplation of the marine environment gave rise to observations that became embroiled in the reorientation of perceptions of the human situation within the natural world necessitated by the evolutionary theory of transmutation.

Writings about seaweed exemplify both the gendering of Victorian natural history and several of those areas in which an active engagement with the non-human biotic world was believed to be improving to the human condition. However, even within the confines of this sub-genre of Victorian natural history, it is clear that there were very different literary preoccupations and emphases. At the outset it is necessary to observe Lynn L. Merrill's distinction between scientific texts and popular natural history in *The Romance of Victorian Natural History* (1989).⁶ The formidable professional accomplishment of Dublin professor

William Henry Harvey, for example, namely the four-volume *Phycologia Britannica* (1846–51), was complemented by *The Sea-side Book* (1849) which was written to please the educated lay-reader.⁷

Furthermore, even among popular guides to natural history there are notable contrasts. The characteristic expressions of natural theology in Isabella Gifford's *Marine Botanist*, which find their purpose in the trope of the revelation of the book of nature, differ markedly in tone from a more touristic approach evident in books by Elizabeth Anne Allom and Louisa Lane Clarke. As Merrill demonstrates, the distinction between scientific and natural-history discourses is particularly evident in the latter's unashamed inclusion of emotional and aesthetic responses to the natural world. It quickly becomes apparent that the bow of the shoreline is like an amphitheatre in which the entire tragi-comedy of human existence is played out, a panorama that encircles and takes in *en passant* a range of sensations and emotions. Popular books about marine botany thus reveal how far Victorian nature study is moralised with problems of the human spirit and identity; for in seaweed literature we encounter embarrassment and pleasure, devotion and fear, love, hilarity and obsession. Natural-history writing, therefore, has particular interest as a discursive interface between science and the humanities.

SETTING FORTH

By the mid-Victorian period, the seaside resort was already a long-established pleasure destination, particularly attractive for its alleged recuperative powers. During the eighteenth century, a revitalising seaweed massage had, on occasion, accompanied more familiar activities such as sea bathing or the seaside promenade.⁸ Seaweed collecting for classificatory purposes was underway by the close of the century, though during this period was most often carried out on behalf of aristocratic patrons of natural history.⁹ David Allen cites the London merchant, John Ellis (1710–76) as the first serious pioneer in marine botany in England. However, from the earliest years, there were notable women collectors. During the late eighteenth century, the prominent naturalist Stephen Hales began assembling specimens for the Princess Dowager of Wales, and the Duchess of Portland built up her collection by enlisting the practical assistance of Mrs Le Coq of Weymouth.¹⁰ Not until the mid-nineteenth century, however, is it possible to identify a popular taste for the deliciously quotidian qualities of the genera long designated the meanest subjects of the plant 'kingdom'. The introduction of the steam-driven printing press, which began to reduce significantly production costs after the end of the French Revolutionary wars, had acted as catalyst to literacy, helping to popularise and democratise all aspects of nature sympathy.¹¹ During the 1850s such a taste was further encouraged by the greater ease of access to coastal regions following the expansion of the railway network.

Another pertinent technical development was the increased availability of microscopes affordable to the middle-class enthusiast. The curiosity of the amateur naturalist was now encouraged by the structures of the air-vessels, frustules and diaphanous strands of filiform algae revealed in marine vegetation hitherto invisible to the naked eye.¹² In this way it was possible to regard the conventional beauties of surrounding nature in a more relative manner now that one could discern such phenomena as the perfect mathematical symmetry of scum and slime that Harvey admired for its elegance in the *Sea-side Book*.¹³ In 'How to Study Natural History' (1846), Charles Kingsley assured his audience that even those with limited budgets could join one of the many natural history societies that had begun to purchase collectively natural history books, apparatus and equipment.¹⁴

PRACTICAL CONSIDERATIONS: NECESSITIES AND IMPEDIMENTA

An early amateur writer, Elizabeth Anne Allom, author of *The Sea-Weed Collector* (1841), particularly commended Ramsgate as a suitable location because its genteel topography made it readily accessible for the fashionable female collector. Intimating a sense of licence, she suggested reassuringly, 'the most scrupulously delicate lady may walk with comfort along the beautifully level sands and collect the most interesting specimens of marine vegetation without the slightest danger or inconvenience from damp or cold'.¹⁵ Others were more resilient. In Gatty's *British Sea-Weeds* there remains a robust acceptance of the practicalities demanded by the study at hand. Gender expectations present an immediate difficulty given the requirements of correct dress. *British Sea-Weeds* opens with pragmatic advice to 'disciples' of algology and explicitly addresses female readers. While conforming to the social codes of women's dress, Gatty clearly regards such clothes as a severe hindrance. She insists that the serious seaweed hunter 'must lay aside for a time all thought of conventional appearances, and be content to support the weight of a pair of boy's sporting boots'.¹⁶ However, while some cross-dressing might be admissible in footwear, Gatty ultimately refused to endorse 'rational dress' for women. The wider Victorian debate about the propriety of usurping the masculine sphere by wearing 'bi-furcated garments'¹⁷ is implicit in the following lines concerning the 'question of petticoats':

If anything would excuse a woman for imitating the costume of a man, it would be what she suffers as a sea-weed collector from those necessary draperies. But to make the best of a bad matter, let woollen be in the ascendant as much as possible; and let the petticoats never come below the ankle.¹⁸

Gatty's misgivings concerning personal appearance are a reminder of that almost ubiquitous sense of embarrassment that Allen suggests accompanied the

‘FREE, BOLD, JOYOUS’

Victorian naturalist.¹⁹ If not cautious and well-wrapped, the female seaweed hunter risked moments of *déshabillé* and she might find herself publicly burdened with strange paraphernalia, sporting curious attire and even waist-deep, face-down or up-ended in the most unexpected predicaments. Yet the seashore remained a space where social expectations were loosened, and there was some licence to wear dress that was warm and, above all, practical – Shirley Hibberd warned his readers against ‘fashionable “fly away” things which the wind will sport with unkindly’.²⁰ Appropriate protective dress enhanced the tactile pleasures of the shore-line, ironically by closing off direct contact:

Enjoy yourself thoroughly as you go, by keeping close to the sea; never minding a few touches from the last gentle waves as they ripple over at your feet. *Feel* all the luxury of not having to be afraid of your boots; neither of wetting nor destroying them. *Feel* all the comfort of walking steadily forward, the very strength of the soles making you tread firm – confident in yourself, and, let me add, in your dress.²¹

Gatty’s intimate mode of second-person direct address is characteristic of a discourse of inclusion and shared participation in much natural history writing by women. Likewise, Louisa Lane Clarke, author of the *Common Seaweeds of the British Coast and Channel Islands* (1865), invitingly confers a sense that the reader is an intimate companion, confidante or accomplice. She appears to revel in an idiosyncratic appearance: ‘We are going for seaweeds. The tin can is slung over one shoulder, an oilskin bag is at our girdle for smaller and more precious specimens, a pole in our hand ready to lift the tangled masses of rough weed away.’²² George Henry Lewes enjoyed describing the mutual contempt with which naturalists and the belles and beaux of the promenade regarded each other at seaside resorts. Like Clarke, in *Sea-Side Studies* (1858), where he describes his expeditions with George Eliot, Lewes challenged convention through humour and self-parody:

We are thus arrayed: a wide-awake hat; an old coat, with manifold pockets in unexpected places, over which is slung a leathern case, containing hammer, chisel, oyster-knife, and paper-knife; trousers warranted not to spoil; *over* the trousers are drawn huge worsted stockings, over which again are drawn huge leathern boots.²³

Equally, Philip Henry Gosse, often associated with austerity and puritanism, found that ‘in striving to maintain your equilibrium, you throw yourself into more attitudes than a posture-master, and cut rather an undignified figure’, and celebrated the incongruity of his slippery antics among the seaweed and his penchant for peeping into crevices as a source of the highest amusement.²⁴ However, what makes such gambols admissible is the sense of the unity of physical, intellectual and spiritual purpose that underlies the endeavour. Virtues and pleasures such as those that follow were experienced by Gosse and Gatty alike:

What if I were to open up before you resources that you could never exhaust in the longest life; a fund of intellectual delight that would never satiate; pursuits so en-

chanting that the more you followed them the more single and ardent would be your love for them; so excellent that they would elevate as well as entertain the mind and body? Does such promise seem extravagant? Believe me, it is no more than may be fulfilled. I am writing not from the report of others, not what I have read in musty books, but what I have felt and proved in many years' experience. The pursuits of which I speak have been my delight from early youth onwards, and they have not abated one jot of their freshness; nay, they are more enchanting than the first day I followed them.²⁵

In order to understand encounters of this kind adequately, it is necessary to apply a phenomenology that embraces both the aspiration to achieve an objective, precise description of the characteristics and exact location of a particular species and a more experiential dimension that considers the subjective aspects of popular marine biology. Here religious sensibility is united with the appeal of the containment, diversity of life and comforting circularity to be found in caves, crevices and rockpools, each of them representing refugia and roundness in the often treacherous coastal environment.

Merrill outlines the emergence of a distinction between outdoor, 'field' naturalists and indoor 'closet' naturalists during the nineteenth century.²⁶ All of the texts here examined are of the former variety and direct contact and a sense of the distinctiveness of place in locations such as Ilfracombe or Filey Bay are of particular consequence. Algologists such as Gatty and Clarke clearly enjoyed their seaweed collecting *alfresco*. While some dress etiquette had to be observed, the ecological richness and diversity of this fragile but dynamic periphery remained a site of personal emancipation for women engaged in marine botany. The most famous naturalists, such as Alexander von Humboldt, Joseph Banks, Charles Darwin or Alfred Russel Wallace, undertook daring and expansive global travel, benefiting from the possibilities thrown up in the wake of imperial expansion; and, particularly during the latter half of the nineteenth century, several women – notably Mary Kingsley, Marianne North and Margaret Fountaine – shared in the enterprise. However, a greater number of naturalists, following the outstanding inspiration of Gilbert White of Selborne, were to be content with their more immediate vicinity. Largely denied opportunities to explore exotic beaches, many women found that the home shores afforded more accessible pickings.²⁷ Today many undeveloped shore-lines remain havens of free access. During the nineteenth century, female naturalists such as Gatty experienced rock pools and sandy seashores as liberating and enticing spaces. This was dependent upon financial solvency, leisure time, mobility and often a supportive partner; Gatty was fortunate in all of these and she was able to travel as far as the Isle of Man, Ireland and the colourful and never to be forgotten 'mesembryanthemum-starred Scilly Isles' to find her specimens.²⁸

THE CAMARADERIE OF SHOREHUNTING

In an ironic reversal of gender conventions, Gatty warns that a 'male companion' may be useful, almost as an auxiliary helpmate, 'to lend a hand and infuse a sense of security' so that 'a very *eerie* hunting-ground may sometimes be ventured upon'. She adds, however, that "'unprotected females" have no business to be running risks for the sake of "vile sea-weeds"'.²⁹ Although this is a reminder of the dangers and conventions that made solitary expeditions difficult for women, the quotation marks around 'unprotected females' in part ironise the phrase and suggest that while Gatty acknowledges the truth of such sentiments she is reluctant fully to endorse them. At the sea-margin, Gatty experiences a state torn between exhilaration and trepidation as the pursuit of natural beauty leads her to a dangerous, transgressive zone, more in keeping with the masculine province of the sublime:

The truth is, the scarce low water plants are apt to haunt very inaccessible places; places, too, where the roaring of the breakers is so near at hand, and the standing ground so wet with spray, that a strong mental effort is necessary to keep the nerves and feet steady, even after the difficulties of getting there are surmounted. Not that the spot is unsafe for any one who is sure of a continuous self-command; but invalids sometimes become sea-weed collectors, and it would be madness to counsel women indiscriminately to be strong-minded above their condition. People can, however, do at one time what they cannot at another [...]³⁰

There is a sense of caution here, given that for women to participate in such extremes of physical activity risks infringing the nineteenth-century separation that rendered 'natural' the divide between the feminine domestic sphere and the supposedly more strenuous demands of the masculine public sphere. Even the irrepressible and adventurous Gatty conceded, 'in reflecting upon the best and easiest shores, such as the choice one of Douglas Bay, Isle of Man, for instance, it must be owned that a low-water-mark expedition is more comfortably undertaken under the protection of a gentleman'.³¹

However, Gatty's expectations of a hypothetical male companion are not high. Her sensitivity towards possible disruption of the coastal environment is expressed in her fear that if one were accompanied by a 'gentleman' he might amuse himself by killing gulls while she takes the initiative in collecting: 'He may fossilise, or sketch, or even (if he *will* be savage and barbaric) shoot gulls, though one had rather not; but no need anyhow, to involve him in the messing after what he may consider "rubbish," unless, happily, he be inclined to assist' (Gatty, *British Sea-Weeds*, xiii.).

In this sense George Eliot was fortunate in taking part in littoral expeditions at Ilfracombe with the guidance and encouragement of Lewes, the prominent nineteenth-century naturalist: 'Every day I gleaned some little bit of naturalistic experience, either through G's calling on me to look through the microscope

or from hunting on the rocks[...].³² For his part, Lewes valued the assistance of Eliot's 'quick female eyes' and 'nimble fingers' as they went out together to 'woo the mermaids'.³³

So, ideally, 'seaweeding' was to be carried out 'with a strong, friendly, and willing, if not learned companion' (Gatty, *British Sea-Weeds*, vii.) for the sake of personal safety and support. However, for Gatty, it was in any case a shared pastime, often undertaken as a family activity. A diary entry for 1850 records: 'Set off for Filey, Alfred, self, seven children, two nurses and the cook. Arrived safely. D.G. went down to the sand and found seaweeds.'³⁴ Her marine botany was also carried out in the context of a network of fellow enthusiasts. The mutual interest in algology shared with William Henry Harvey and Catherine Cutler developed into firm personal friendships.³⁵ Intellectual exchanges of this kind conform to the 'relational' model which psychologist Ruth Formanek has used to explain the enthusiasm for collecting in terms of a desire to engage actively with other minds in a matrix of supportive and mutually advantageous relationships.³⁶ A strong sense of this rapport and common bond of algological camaraderie is expressed by Gatty's address to her readers as a 'sisterhood' of seaweed hunters.

WOMEN'S SCIENTIFIC EMPOWERMENT THROUGH MARINE BOTANY

Gatty was keen to stress that her seaweed hunting was to be kept firmly within the bounds of an entertaining, and hopefully improving, amateur pursuit and did not encroach upon professional algology as a scientific undertaking. She was content to defer to Harvey's expertise and her modesty often becomes characterised by expressions of self-depreciation. In *Waifs and Strays of Natural History* (1871) she writes:

We remember to have often made Dr Harvey smile, by asking him to *help a lame dog over a stile*, when we wanted him to make a scientific statement intelligible to our unlearned ears.³⁷

By contrast to Harvey's professionalism, Gatty claimed only to aspire to impart 'a little knowledge of the subject, in however desultory a way'.³⁸ Her diffidence and emphasis upon the unmethodical, diminutive nature of her work reflects her continued acceptance of a separate sphere for women within botany. Gatty's refusal to push herself forward as an authoritative voice is reflected in her wider views about public pronouncements by women. After listening to a speech by Frances Power Cobbe, she objected:

I was interested by what was said and liked the lady who spoke. But to hear a woman hold forth in public, except when she is acting and so not supposed to be herself, is like listening to bells rung backwards.³⁹

Isabella Gifford with equal modesty offered 'the object of the little work' she had written, namely *The Marine Botanist* of 1851, as 'short and scientific descriptions of the commonest kinds, given in as simple words as possible'.⁴⁰ Likewise Clarke suggested that her 'easy Guide' might be 'valuable to a young collector for album or fancy work' but added that she would 'by no means offer it to my scientific friends', thus indicating that her work was intended for entertainment and rudimentary education.⁴¹ Such comments are in keeping with Londa Schiebinger's suggestion that while women built up impressive botanical collections, wrote competent descriptive works and became able illustrators, professional taxonomy was regarded as men's work, demonstrating that there could be a division of labour within the study of botany.⁴² A particular instance is that of the extensive but unacknowledged contributions, primarily as illustrator, that Emily Bowes Gosse made to works by her husband such as *Sea-side Pleasures* (1853) and *The Aquarium* (1854).⁴³ Schiebinger's observation is further born out by Ann B. Shteir's note that while some regional botanical societies welcomed women in a spirit of inclusiveness, the major national societies excluded them from the upper echelons of scientific endeavour until the twentieth century. Shteir reveals that the Linnaean Society opened up access to women in 1919, while admission to the Royal Society was not permitted until 1946.⁴⁴

However, despite their protestations that they were unscientific, we should perhaps be wary of taking the modest caveats of women writers about their proficiency in marine botany at face value. Progress in algology was considered to be worthy and improving because it was dependent upon persistence and hard work. To be successful, it was not sufficient to wait for specimens to be thrown up by the happenstance of the incoming tide. Gatty warns: 'Patience and enjoyment must go hand in hand here. To stop down once or twice and then to be weary, will not do.'⁴⁵ The 1860s were the high-tide mark of the Victorian work ethic – *British Sea-Weeds* was published four years after Samuel Smiles's *Self-Help*. Hibberd equally stresses conscientious application, urging 'one of the finest qualities in seashore collecting is a passion for patient scrutiny'.⁴⁶ Gatty's diligence in algology was acknowledged and recognised by her male correspondents and her biographer, Christabel Maxwell, records that it was an 'intense source of gratification' when two species were named in her honour; Dr Harvey named an Australian algae *Gattya pinella* and Dr Johnson paid her the compliment of naming a marine worm *Gattia spectabilis*.⁴⁷

For women, natural history was a field of scientific enquiry in which, in Schiebinger's words, knowledge had long been 'shaped by patterns of inclusion and exclusion from the scientific community'.⁴⁸ Within such constraints, the sense of partnership with male naturalists in a shared spirit of enquiry enjoyed by female algologists was therefore a partial yet nonetheless real achievement in the acceptance and recognition of women's science. Gatty's *British Sea-Weeds* was the result of fourteen years of study and was still being consulted as a standard text of classification in the twentieth century. While, as we have

seen, Victorian women were excluded from professional botany, it appears therefore that botanical science remained an endeavour in which women were able to participate and contribute, and so make progress towards full inclusion in the national societies during the twentieth century.⁴⁹ Although the presence of the separate-spheres convention is apparent in much popular botanical writing during the mid-nineteenth century, it was already being challenged by contemporaries. As early as 1830, Robert Kaye Greville mocked the exclusion of girls and young women from the study. He perhaps also recalled that, at the turn of the century, botany retained disreputable connotations, due to its reliance upon sexualised Linnaean taxonomy:

Botany is now becoming a favourite study and an elegant recreation, without meeting with more than [...] a faint ejaculation from the matron of the old school, who remembers to have been told in her early days, that young ladies, at least, were more profitably employed in adding to the family receipt-book, and confining their natural history to indescribable performances in cross-stitch.⁵⁰

Greville was forthright in his acknowledgement of women's contribution to algology and dedicated his *Algæ Britannicæ* to them:

It is not without a feeling of extreme pleasure that, by means of the present Work, I shall place in the hands of my fair and intelligent countrywomen, a guide to some of the wonders of the Great Deep; nor need I be ashamed to confess that I have kept them in view throughout the whole undertaking. To them we are indebted for much of what we know upon the subject. The very beauty and delicacy of the objects have ever attracted their attention; and who will deny the rationality of that admiration which is expended on the works of an Almighty Hand – or censure as trifling the collecting of things, even in the absence of information concerning them, which, if contemplated as they ought to be, can only tend to refine the mind, and raise its sentiments. To Mrs GRIFFITHS, Miss HUTCHINS, Miss HILL, Miss CUTLER, and Mrs HARE, we owe very many discoveries ...⁵¹

David Landsborough, author of the *Popular History of British Sea-Weeds*, cites seven females and six males among the extensive acknowledgements in the preface to the 1851 edition.⁵² In particular, Amelia Griffiths of Torquay (1768–1858) – for Landsborough, the ‘willingly acknowledged Queen of Algologists’ – had set a precedent as an outstanding authority in this area. However, while she discovered several species during the 1830s and 1840s, Landsborough remarks that Griffiths did not directly make her work public, being:

a lady who, so far as we know, has published nothing in her own name, – but who may yet be said to have published much, as she has so often been consulted by distinguished naturalists, who have been proud to acknowledge the benefit they have derived from her scientific eye and sound judgement.⁵³

‘FREE, BOLD, JOYOUS’

J. R. Hulme, physician and author of *The Scarborough Algae* (1842), concurred that it was a branch of botanical science in which women were pre-eminent and that much present knowledge was due to the ‘indefatigable exertions’ of female collectors such as Griffiths and Cutler.⁵⁴ Indeed, some naturalists feared that botany was not a suitably ‘manly’ activity. By 1881, Charles Kingsley, apostle of ‘muscular Christianity’,⁵⁵ felt compelled to defend marine botany from accusations of effeminacy and reclaim its *gravitas*:

There are those who regard it as a mere amusement, and that as a somewhat effeminate one; and think that it can best help to while away a leisure hour harmlessly, and perhaps usefully, as a substitute for coarser sports, or for the reading of novels. Those, however, who have followed it out, especially on the sea-shore know better. They can tell from experience, that over and above its accessory charms of pure sea-breezes, and wild rambles by cliff and loch, the study itself has had a weighty moral effect upon their hearts and spirits.⁵⁶

Such concerns bear out Shteir’s observation that an increasing separation was emerging between women’s popular science and masculine professional science after 1830.⁵⁷ So, how might seaweed collecting transcend its status as a ‘mere amusement’ and attain a more ‘weighty’ importance for enthusiasts?

SELF-BETTERMENT THROUGH ALGAE

Hibberd argues, in *The Seaweed Collector* of 1872, that even ‘if it does not happen to lead to something higher’, algology is firstly a ‘delightful recreation’ that is open to all those who at some time have visited the seaside where they will inevitably have ‘found some entertainment in the observation of seaweed’.⁵⁸ For women, genera such as seaweeds and ferns were collectable objects from nature with properties that made them amenable to drying and pressing so that they could be conveniently preserved as specimens in presentation albums. Again there was a perceived difference between the private domestic accomplishment of the aesthetically arranged album and the more masculine project of the scientifically assembled herbarium. A guide published in 1867, *A Handy-Book to the Collection and Preparation of Freshwater and Marine Algae, Diatoms, Desmids, Fungi, Lichens, Mosses and other of the Lower Cryptogamia*, admonishes: ‘Fragments torn off from the main stem look very pretty, and do well enough to adorn a lady’s album, but, as a rule, are valueless to a botanist.’⁵⁹ Also cryptogamous species such as the algae could be shared and admired by acquaintances without presenting the difficulties of propriety raised by the ‘immodestly’ sexualised distinctions apparent in flowering plants and zoological specimens, or offend ethical sensibilities that might be troubled by cutting up sentient animal life or poisoning lepidoptera. Women who undertook sustained study into zoophytes, such as Agnes Catlow and Anna Thynne, were therefore

exceptional. In *Theatres of Glass* (2003) Rebecca Stott reclaims women's history by attributing the invention of the indoor aquarium, with its self-contained ecosystem to Anna Thynne.⁶⁰ Finding that her cook's collection of pie dishes proved inadequate for keeping her specimens alive long enough to investigate their life cycles, Thynne's invention of the aquarium furthered her significant scientific achievement in extending knowledge of the asexual reproduction of madrepores. Moreover, when popularised by prominent naturalists, particularly her friend Philip Henry Gosse, Thynne's glass 'theatres' precipitated the 'Aquarium mania' of the 1840s and 1850s, which expressed a nation-wide fervour for studying all marine life in its living state.⁶¹

For Gatty, however, as a 'field' rather than a 'closet' naturalist, the immediate physical benefit of seaweed collecting was as a form of gentle exercise for those who have 'taken up the pursuit originally as a resource against weariness, or a light possible occupation during hours of sickness', which was clearly her own experience, following sustained fatigue.⁶² Like Jean-Jacques Rousseau, who first inspired a romantic enthusiasm for botanising among the charmed readers of *Reveries of the Solitary Walker* (1782), writers such as Anne Pratt enjoyed a restorative effect in sublimating present difficulties in pursuit of rare and beautiful plants. She wrote in *Chapters on the Common Things of the Sea-Side* (1850):

Dr. Cullen used to say that he had cured weak stomachs by engaging his patients in the study of botany, and particularly in the investigation of wild plants; and many a head-ache, and a heart-ache too, would be relieved if its owner could be brought to feel an interest in the shells or seaweeds which are strewn on the beach ...⁶³

Gatty makes no grandiose claims for the redemption of humankind by the charms of seaweed but instead exalts algology as an escapist activity, an antidote to current affairs which makes one gleefully forgetful of the wider world.⁶⁴ Indeed, Gatty probably regarded dabbling in rock pools as a desirable alternative to dabbling in the more murky waters of politics for her mostly female readership. There is a facetious prioritising of the requirements of seaweed specimens over the imperatives of worldly matters which are considered secondary in importance to the other-worldly quality of littoral oblivion. Repeatedly Gatty conveys a sense of material satisfaction in the occasions for mental and physical engagement that collecting affords – both in handling natural specimens and in the creative use of often arcane paraphernalia – whether this be in initially locating seaweeds or subsequently in processing them. After a return from the shore, she suggests, 'the squabbles of nations may come in for a share of his attention perhaps; but, even then, only imperfectly, for the collected treasures have to be examined and preserved, and the heart of the collector yearns after them'.⁶⁵

However, Gatty's love of sea-nature does not bear out her own claims for the total forgetfulness of human concerns. She clearly desired to share her experience of physical and psychical regeneration through seaweed with others, particularly her 'sisterhood' of fellow amateur collectors. Also, five years before the publica-

tion of *British Sea-Weeds*, Gatty created presentation copies of books filled with mounted specimens of seaweeds which she then sold and used the proceeds to buy blankets for the poor of her parish – a fascinating insight into the practical nature of Victorian philanthropy.⁶⁶ Pratt, briefly allowing herself a digression into home economics and the virtues of self-reliance, recommended a seaweed called carrageen moss, for which she, similarly, had philanthropic hopes:

Plentiful as this plant is on our shores, and nutritious as are its qualities, it is to be regretted that it is not more generally used by the poor as food [...] a small portion of meat, accompanied by a good quantity of the carrageen moss, well boiled, would furnish a wholesome meal to many a poor family.⁶⁷

Gifford, Hibberd and Clarke all dedicate chapters in their books to the practical and economic uses of seaweed.

THE 'RAVAGED' SHORELINE

Gatty's success and the substantial literature that popularised shore hunting was no doubt responsible for encouraging many Victorians to take up natural history. Unfortunately, Gatty may have lived to share Philip Gosse's distress at the thought that his invitation to other collectors to share the delights of the seashore caused them to kill the thing they loved. Edmund Gosse recorded his father's dismay at the devastation of the shoreline ecology by overzealous collectors. This was in contrast to earlier years in which the rock pools were pristine, to the extent that 'Adam and Eve, stepping lightly down to bathe in the rainbow-coloured spray, would have seen the identical sights.' Writing in 1907, Gosse described his memories of the consummate, prelapsarian rock pools of the 1850s and their subsequent despoliation by collectors. His retrospect forms an early critique of the touristic gaze and a curiosity for natural history that resulted in a destructive ecological impact:

An army of 'collectors' has passed over them, and ravaged every corner of them. The fairy paradise has been violated, the exquisite product of centuries of natural selection has been crushed under the rough paw of well-meaning, idle-minded curiosity. That my Father, himself so reverent, so conservative, had by the popularity of his books acquired the direct responsibility for a calamity that he had never anticipated, became clear enough to himself before many years had passed, and cost him great chagrin. No one will see again on the shore of England what I saw in my childhood, the submarine vision of dark rocks, speckled and starred with an infinite variety of colour, and streamed over by silken flags of royal crimson and purple.⁶⁸

The demise of this marine trooping the colour is patriotically imaged as a diminution of Englishness. The law of supply and demand has unfortunate consequences when applied to the collection of rare species; the most endangered

or scarce are always most coveted. Allen records that the popularity of ferns similarly led to the decimation of many woodlands by private collectors and by those picking for the market.⁶⁹ Hibberd's book also obliquely acknowledges the environmental consequences of human industry: 'everywhere rocky coasts are more productive than those that are sandy or muddy, or defiled by town drainage or seaside trade'.⁷⁰ In Kingsley's popular children's book, it is the water babies that are responsible for mending broken seaweed and keeping rock pools neat and clean. His objection to contaminating human activity anticipates the concerns of popular environmental groups of our own time, such as Greenpeace and Surfers Against Sewage, by a hundred and thirty years:

Only where men are wasteful and dirty, and let sewers run into the sea, instead of putting the stuff upon the fields like thrifty reasonable souls; or throw herring's heads, and dead dog-fish, or any other refuse, into the water; or in any way make a mess upon the clean shore, there the water babies will not come, sometimes not for hundreds of years (for they cannot abide anything smelly or foul) [...]. And that, I suppose, is the reason why there are not water babies at any watering place which I have ever seen.⁷¹

While there is clearly some truth in Gosse's paradox that the popular literature of natural history brought about the destruction of the very ecosystem that it celebrated, it is also apparent that, through their close and sensitive observations of the shoreline, naturalists were often the first to become aware of the threat that human activity posed. Again, for Hibberd, it is the wider ecological context of seaweed that is central to the importance which he attaches to its study. This context links humanity with other animal species: 'amid the wealth of organic creation in the midst of which our lives are embedded, the vegetation of the sea may fairly claim a share of our attention for its intimate associations with animal organisms that are perhaps more wonderful than itself'. The study of seaweed is improving, therefore, because it increases awareness of a broader range of life forms: 'how vast a world of life it nourishes and jealously hides in its bosom', he declares.⁷²

PERMITTED PLEASURES

George Eliot was one amateur naturalist fortunate enough to explore the unravaged shoreline of the 1850s,⁷³ and who was equally enchanted by the sensuous 'fairy paradise' that she discovered:

There are tide-pools to be seen at almost every other step on the littoral zone at Ilfracombe, and I shall never forget their appearance when we first arrived there. The *Corallina Officinalis* was then in its greatest perfection, and with its purple pink fronds threw into relief the dark olive fronds of the *Laminariæ* on one side and the vivid green of the *Ulva* and *Enteromorpha* on the other. After we had been there a few

‘FREE, BOLD, JOYOUS’

weeks the *Corallina* was faded and I noticed the *Mesogloia vermicularis* and the *M. virescens*, which look very lovely in the water from the white cilia which make the most delicate fringe to their yellow-brown whip like fronds, and some of the commoner *Polysiphoniæ*. But I had not yet learned to look for the rarer *Rhodospermia* under the olive and green weeds at the surface. These tidepools made one quite in love with sea-weeds [...]⁷⁴

While Eliot confessed that she was ‘quite in love with sea-weeds’, Gatty also described the sentiments aroused in the ‘loving disciple’ by the shoreline and made use of the analogy of a love relationship to express her passion for collecting.⁷⁵ Indeed, Shteir even describes Gatty as a ‘botanical bacchante’,⁷⁶ while Clarke found her formerly quiet tide-pool ‘lashed into foam by the rough yet joyous kisses of the up-coming tide’.⁷⁷ Such descriptions are clearly derived from the discourse of fictional romance. So how might the impulses behind these love affairs with seaweeds be explained? Allen’s comments on the Victorian fern craze may equally be applied to the fervour for seaweed:

At the height of the Fern Craze, in the middle ‘fifties, we have an excellent example of a society in the grip of a powerful emotion, a ‘collective projection,’ rooted in some deeply buried psychological layer. We know too little about such outbursts – and probably can never know enough.⁷⁸

Twenty-five years after Allen’s study, Werner Muensterberger’s *Collecting. An Unruly Passion*, was published, an exhaustive enquiry into the motivations of the collector.⁷⁹ His investigation of the collecting mentalité reveals a pattern of infatuation in which ‘the search and obtainment sound like adventure stories or magical-romantic pursuit’, for desired objects that become compensatory companions able to provide restitution and reparation for the uncertainties, disappointments and uncontrollability of human relationships.⁸⁰ It is not necessary to pursue heavy-handed psychoanalytical interpretations of anal-retentive behaviour to attribute fantasies of control in the processes at work in the selection and pinning down of the lepidopterist’s exhibition board. To fix a botanical specimen into position with a touch of isinglass was likewise an opportunity to impose an order of one’s own choosing upon the complexities of the floral world. Looking down at algae, through the framing device of the microscope or from above a rock pool, privileged the observer with an omniscient perspective.

Such control however, was at best partial and always illusory. A close study of the natural world could equally demonstrate the limits of human knowledge. A pragmatic recognition of the partial nature human perception, however, also necessitates an acknowledgement of the infinite. With this idea in mind, Lewes wrote in 1858:

In direct contact with Nature we not only learn reverence by having our own insignificance forced on us, but we learn more and more to appreciate the Infinity on all sides; so that we cannot give ourselves up to one small segment of the circle, no

matter how small, without speedily discerning that life piled on life would not suffice to travel over this small segment of a segment.⁸¹

SHE STOOPS TO WONDER: THE AESTHETICS OF ROCK POOLS

Equally, a keen aesthetic sense of the luminescent colours and textures of seaweeds caused collectors to become mesmerised by the other-worldly beauty of the marine environment, teeming with species reproducing, flourishing and mutually consuming in an existence ultimately inscrutable to human sensibilities. Landsborough showed a female acquaintance a specimen of the *Licmophora splendida*:

Aided by a microscope, the whole was so beautiful that a lady to whom I showed a portion of *Licmophora* thus magnified, said she could not fall asleep for a long time that night, as the lovely fans seemed ever before her eyes; and when she did sleep she dreamed of them.⁸²

Louisa Lane Clarke likewise found herself entranced by the peacock-tailed appearance of the *Padina pavonia*: ‘truly’, she wrote, ‘the play of colour on the frond beneath the water is so beautiful, we bend to gaze upon it, and forget to gather it’.⁸³ Eliot clearly shared this sense of the beauty and mystery of marine life and confided an unusual plan for a nocturnal liaison with the colourfully anthropomorphised *Actiniæ* (sea anemones). The characters described in a letter to Sara Hennell of 1856 are observed with the eye of the novelist:

We have a project of going into St. Catherine’s caverns with lanterns some night when the tide is low about 11, for the sake of seeing the zoophytes preparing for their midnight revels. The Actiniæ, like other belles, put on their best faces for such occasions.⁸⁴

For Gatty, the improving nature of the pursuit was always combined with a sense of liberating joy. When she described her elation upon experiencing the delights of this transcendental other world with its curious confluence of the homely and the alien, she expressed all the euphoria of an earthly nirvana:

to walk where you are walking makes you feel free, bold, joyous, monarch of all you survey, untrammelled, at ease, at home! At home, though among all manner of strange, unknown creatures, flung at your feet every time by the quick succeeding waves.⁸⁵

This stress upon being at home suggests that Gatty attained moments of self-actualisation, feeling grounded, empowered and connected to the universe, making her pursuit of sea-nature a striking example of biophilia. There are also paradoxes here of which Gatty demonstrates an awareness. There is a tension between a

sense of familiarity and of being at home while at the same time being attracted by the estrangement of existing among 'strange, unknown creatures'.

Gatty's ecological sense of feeling at home in the living world is fitting given that, as the Norwegian philosopher of deep ecology Arne Naess reminds us, the etymological root of ecology is from the Greek *oikos*, pertaining to the home or household.⁸⁶ Familiar pleasure in repeated experience, a sense of reminiscence and an engagement with surroundings that are identified as meaningful are apparent in several works of popular marine botany. Anne Pratt, for instance, found that collecting and cooking dulse had a nostalgic effect, enhancing a process of recall and visualisation:

perhaps because it brings with it some associations with childhood, as some of us may now like blackberries or other wild fruits, because they remind us of by-gone times, and happy hours in the woodlands.⁸⁷

For the Reverend Robert Fraser, in *The Seaside Naturalist* (1868), this powerful sense of reminiscence is theologically framed. For the botanist, he writes:

Every leaf that issues from nature's press is in his view like the Prophet's roll, printed within and without in characters full of the sublimest significance; every blade of grass is vocal to him, and, awakening the echoes of memory, renews past impressions and past enjoyments.⁸⁸

Human urges for questing, remembrance and wonder that are possibly primal or universal, therefore, are commonly expressed in forms that are culturally grounded in the theological worldviews of mid-Victorian Britain. The notion that, as we shall see, the tangible, living world is a revelation of the book of nature, is closely linked to a further sense of spiritual elevation through concrete existence in Gatty's description. The transcendence of self in the idea of being 'untrammelled' is a consistent one among mid-Victorian naturalists as they reflect upon their enthusiasm. For Kingsley, botany and other varieties of natural history answer 'that great need of all men, to get rid of self' along with 'all the cares, even all the hopes of life, and to be alone with all the inexhaustible beauty and glory of Nature, and of God who made her'.⁸⁹ However, the similarity of the pleasure and utility of botany identified by Gatty and Kingsley is notably distinguished by the particular emphasis in *Glaucus* on the premise that children that are tutored to be alert and observant on a small, local scale in the expectation that they will develop qualities that make them suitable 'hereafter to be rulers over much'.⁹⁰ The distinctions to be made between different kinds of pleasure in gazing and exploring are, therefore, in part gendered ones. Barbara Gates's care to differentiate between her idea of the 'Victorian female sublime' and that imperialist sense of control over the natural world conveyed by Mary Louise Pratt in *Imperial Eyes* (1992) is helpful here. 'The two oeuvres', Gates argues, 'differ substantially', in so far as:

the Victorian female sublime emphasised not power *over* nature but the power *of* nature in a given place, and not a rhetoric of presence so much as a rhetoric based in absence, especially absence of self. The women who engaged this female sublime featured themselves as witnesses or participants, not monarchs.

At the same time the discourse of imperialism was ready to hand and Gatty uses the very phrase employed to characterise the gaze of Pratt's 'imperial authority', namely 'monarch of all you survey'.⁹¹ This controlling gaze, however, is tempered by Gatty's acknowledgement of the limits to her comprehension. For along with the beauty of this liminal world between earth and sea came an enduring element of mystery. A glimpse into a bounded and transparent rock pool offered, and still offers, a vision of a radically different other world, a microcosm of biota caught up in a cycle of existence indifferent to human concerns. Hibberd referred to that 'mystery that surrounds its life in the depths of the ever-changing waters'.⁹² The species of sea-fan, the gorgonias, were named after Classical gorgons, such as Medusa with her hair made up of live snakes, who once turned those who gazed upon them into stone. Now, however, the gorgonias particularly enchanted Gatty because she considered them to be works of God's creation:

Oh those Gorgonias! Let us be proud of the few we have, as connecting our seas with those warmer ones where the lovely race abounds – gorgeous with tints worthy of the sunnier skies – scarlet, crimson, lilac, and yellow overcoats being as common there as white. The forms there, too, are endless: now they spread into a curious and complicated network, arranged in fan-like layers: now they wave to and fro in the water, like plumes of magic feathers, delicate and majestic as as those of the bird of paradise itself [...] in beholding those deep-sea mysteries of creation, so wonderful in their compound life, so beautiful even in death, so unaccountable in what, to our ignorance, seems their purposeless perfection [...] They are pitiful students of Nature, indeed, who can investigate without loving, admire and not adore. "All thy works praise thee, O Lord, and thy saints give thanks to thee."⁹³

READING TESTAMENTS IN BLADDERWRACK: FAITH AND DOUBT IN THE BOOK OF NATURE

Many of these chronicles of salt marsh and rock pool are written firmly in the tradition of natural theology and the moment of rejoicing in a created world becomes a spiritual act of worship, in which the shore-line teems with as much symbolism as marine life. The mysticism of an extraordinary entry by Pratt even recalls the medieval Christian belief that God placed 'signatures'⁹⁴ in his works for human divination and as a test of faith. When viewed under the microscope, she informs the reader, one species of *Griffithsia* has: 'strings of small pearl-like substances, most beautifully and symmetrically disposed, each marked with a

‘FREE, BOLD, JOYOUS’

white cross, surrounded by a rich red colour’.⁹⁵ A similar response was that of Louisa Lane Clarke, for whom the marks upon tiny shells are like the ciphers of miniature Rosetta Stones: ‘our hearts are directed upward even by a slide of microscopic shells sculptured with the hieroglyphics of the Creator’.⁹⁶ For Hibberd seaweed is valued ‘above all things, because it affords us one great and, in a certain sense, complete expression of the will of God in things created’.⁹⁷ He suggests that it helps to forge a human bond with the natural world and cites ‘the world is not wholly profane in which we have given heed to some natural object’.⁹⁸ Isabella Gifford affirmed the role of natural history in demonstrating an underlying created order that united all things:

The pages of the Great Book of Nature lie open before our eyes; and he who attempts, with an earnest and persevering spirit, to read but a few lines from thence, will see the Almighty Power alike evident in the smallest and the greatest of His works – will see in all things the beautiful order and regularity that rule alike o’er the immense planet and the lowliest plant.⁹⁹

Even before 1859, such celebration of the living world was asserted with decreasing confidence, given an often unspoken anxiety about the ongoing transformation in thinking about natural history. The contentious *Vestiges of the Natural History of Creation* (1844), written by Robert Chambers (whose anonymity of authorship was diligently upheld), proposed an evolutionary explanation for the development of life on Earth and was a widely read exposition of ideas already speculated upon by Jean-Baptiste Lamarck, Denis Diderot and Erasmus Darwin during the eighteenth century.¹⁰⁰ James A. Secord’s account of the reception of Chambers’ book (which outsold Darwin’s *Origin of Species* in every decade up until the 1890s), details the context of orthodoxy and non-conformism, and freethinking materialism: tensions which appear as fissures within the discourse of popular natural history, expressed, as we shall see, even in the denials on the part of writers such as David Landsborough. This reflects the need felt by many to reorient their personal cosmologies and to make sense of an uncertain world in the throes of the evolutionary transformation now exemplified by Darwinian science. In *Darwin’s Plots*, Gillian Beer, recalling that it was Darwin’s work on cirripedes that was so important in demonstrating organic progression, suggests that the evolutionary hypothesis that life had its origins in the sea made the marine environment a very immediate area of interest and contention. At the microscopic level attention to the homology of single and simple-celled organisms revealed, in Rebecca Stott’s words, that ‘the newly perceived permeability of the animal-vegetable boundary in the world of marine zoology opened the way for Darwin’s world of fluxing and mutating forms’.¹⁰¹ Questions of anatomical homology became contentious and ultimately political ones. The argument from series which had begun as a foundation of the argument from design was shortly to become axiomatic in evolutionary perspectives. Harvey argued in 1849 that:

A naturalist ever wishes for a series, that he may trace the limit of variation in different species and genera. He works with a constant remembrance of the unity of Nature. The more he discovers traces of affinity between different groups, the more the unity of design manifests itself; and the more his conceptions of a personality in the scheme of Nature are strengthened, and become fixed.¹⁰²

However, in subsequent years it appears that Harvey, in common with many naturalists of his generation, began to reinterpret the significance of such organic affinities. Gatty tellingly included Charles Darwin in a picture collection she called her ‘Chamber of Horrors’, and her suspicion that Harvey had some sympathy with Darwin’s ideas began to place a strain upon their relationship.¹⁰³

Even before Darwin and Wallace’s ideas were published, recent ocean exploration began to represent a challenge to a human-centred cosmology.¹⁰⁴ Since Charles Lyell’s uniformitarian hypothesis about geological processes was published in the influential *Principles of Geology* (1830–33), the permeation of the idea of deep time generated a new kind of secular awe in Victorian society. The intellectual vogue for cosmogony and the enigma of origins that Beer records is an important factor in the prevailing interest in marine biology during the mid-nineteenth century.¹⁰⁵ The extent to which algology had become entangled in the bitter Victorian controversy about the human relationship to life on Earth, particularly prompted by the publication of Chambers’ *Vestiges*, is made explicit in Landsborough’s book, George Eliot’s own authority for identifying seaweeds:

There is yet another advantage arising from the study of Algology, and indeed of Natural Science in general, which it would be unpardonable to omit. It is of great importance that the young in particular, should be armed against the artifices of those who, by a plausible mixture of facts and fiction, try to sap the foundation of our holy faith, and too often succeed in throwing stumbling-blocks in the way of the unwary [...]. By their theory of development, – provided you unwittingly swallow all their pretended facts, – they will trace the progress of a rational creature, from a little almost invisible *monad* floating in the sea, till the monad becomes a monkey, and the monkey a man. And they will tell you that the oak, the monarch of the woods, has arrived at his dignity by almost imperceptible steps, being, some thousands of years ago, only a humble sea-weed in the universal ocean [...].¹⁰⁶

The idea that one could look ‘Thro’ Nature up to Nature’s God’ is asserted with striking frequency in the prefaces of books published during the heyday of the popular works on marine botany from the late 1840s to the late 1860s.¹⁰⁷ The Paleyan insistence that species were fixed archetypes, in existence since the creation, while varieties represented less enduring differences that reflected the requirement to fit particular conditions, was based on an assumption of design in a stable and theologically coherent moral universe. After the 1860s there are noticeably fewer new editions of popular texts of the kind I have examined.

The post-Darwinian antagonism between science and theology, however, may be exaggerated and dominant Victorian opinion, even among scientists, continued to be framed within a Christian worldview. In private, Darwin himself humbly conceded: 'The mystery of the beginning of all things is insoluble by us; and I for one must be content to remain an Agnostic.'¹⁰⁸ Rather than rejecting evolutionary theory, a common response was that exemplified by Christian naturalists such as Charles Kingsley who came to believe that natural selection was God's mechanism for creating the diversity of life on Earth. Nevertheless in the later decades of the nineteenth century, marked by a less certain faith, it is possible that the ethical imperative, that was the concomitant of natural theology for writers such as Gatty and Pratt, was thwarted and not shared by women and men of the succeeding generation. It is likely that the market for new popular guides to algology was simply exhausted by the later 1870s, given the adequate number of accessible guides that had been produced to meet the demands of enthusiasts. However, it may also be the case that the pleasures of moral and spiritual improvement diminished as the immediate link between seaweeds and their creator appeared to be severed. Even for nature writers who for the most part remained believers, the former escape to a purposive world of moral integrity and improvement – where one could indeed feel 'at ease, at home', and where predation augmented a higher purpose – came to be problematised by the emergence of a cultural association of the natural world with the 'struggle for existence' and a cosmos determined by the mechanism of chance and probability. By 1882 we find that even that most steadfast creationist Philip Henry Gosse was persuaded to omit references to the 'Almighty God' in a paper about lepidoptera that was presented to the Linnaean Society on the grounds that such language now appeared anachronistic and out of keeping with expected scientific discourse.¹⁰⁹ Such allusions are certainly absent in an elementary botanical text produced towards the close of the century, George Murray's *An Introduction to the Study of Seaweeds* (1895). Even a Religious Tract Society publication, namely Henry Scherren's *Ponds and Rock Pools* (1894), is without theological reference beyond an introduction, added by the Society's Committee and too brief to act as a frame for the text. Scherren quotes Darwin's works without perturbation or intimation of controversy.

'AT HOME' AGAIN?: A FINAL GAZE ON A RECEDING SHORE

The case of George Eliot's speculative and less formal notes constitute a more secular celebration and valuation of the marine environment that offers an earlier contrast to some of the popular guides to marine botany that I have examined. For Eliot and George Henry Lewes, shore hunting was an opportunity to undertake an active engagement with the living world, and the taxonomies of natural history contributed to making sense of that world and conferring some notion of

order upon its bewildering complexities. In this respect Eliot's 'Recollections of Ilfracombe' (1856) define the way in which a fascination with cryptogamous plants and zoophytes becomes an act of self-exploration:

I never before longed so much to know the names of things as during this visit to Ilfracombe. The desire is part of the tendency that is now constantly growing in distinct, vivid ideas. The mere fact of naming an object tends to give definiteness to our conception of it – we have then a sign that at once calls up in our minds the distinctive qualities which mark out for us that particular object from all others.¹¹⁰

In her informal musings on the shore-line, Eliot thus intuits the value of human participation in natural history in the construction of a logos. Michel Foucault observed, in *The Order of Things*, that part of the epistemic shift that took place during the nineteenth century was the rigorous interrogation and classification of language itself using taxonomic strategies of tabulation themselves honed and imported from the ostensibly objective discourse of natural science.¹¹¹ Eliot is clearly sensitive to the ontological significance of natural history and the semantic pleasure of naming the things of the shore in helping to frame her own mental faculties and in the construction of self. Indeed, it is significant that it was during this summer, reading zoology and Shakespeare, that Eliot, urged by Lewes, decided to try her hand at writing fiction.¹¹² Four years later, in *The Mill on the Floss* (1860), Eliot described the significance of childhood experience of the natural world in establishing a broader love for the earth and conditioning adult patterns of thought. Such things as familiar wild flowers and birds, she writes, 'are the mother tongue of our imagination, the language that is laden with all the subtle inextricable associations the fleeting hours of our childhood left behind'.¹¹³

In imposing her own conceptual and linguistic patterns upon non-human species and processes, a novelist such as Eliot is able to create her own 'gestalts', a term that Arne Naess has adapted to describe the holistic relationship between organic entities and the ecosystem within which they are contextualised.¹¹⁴ These are analogous to the way in which the complex network of historical and cultural relationships in the zoologically aware *Middlemarch* attains a meaning in the whole that is beyond the sum of its character parts.¹¹⁵ By the act of naming Eliot (a sceptic in religion) is able to ground herself more comfortably within the natural environment through a humanising framework. Such systematising therefore encourages the development of a sensibility towards the dynamic interconnectedness of life and natural processes. The impulse to impose a taxonomic structure upon living things has been contradictory in its consequences, finding expression in both the capitalist commodification, appropriation and destruction of the natural world, that Mary Louise Pratt critiqued in *Imperial Eyes*, and a more ecologically minded engagement with, and appreciation of, such habitats.

'FREE, BOLD, JOYOUS'

Victorian algologists found that the seaweeds, the lowliest botanical tribe, had a significance that went far beyond a pastime to occupy the mind while taking the sea-breeze. For within the bounds of the common rock pool there could be spied 'humble' representatives of an entire Divine cosmic order: an order that was increasingly contested. If we now peer discreetly into the neglected world of the seaweed hunter we ourselves discover a gleaming cameo vividly framing the perspectives and sensibilities of Victorian naturalists. Algology at once reflects a delight in the physical and intellectual participation in natural history that grounds the self in the world but, at the same time, refracts contentions, which disrupted and unsettled those selves in a moment of profound epistemological transition. These studies, therefore, which are quite literally of the marginal, touch upon some of the central concerns and problems of ecocriticism such as the phenomenon of biophilia, the gap between the natural environment and the cultural discourse about it and the politics of gender identity in the representation of that natural environment.

NOTES

¹ Gatty was loaned a copy of Dr Harvey's *Phycologia Britannica*. Possibly there was some discussion of the obstetric uses of seaweed, given her personal interest in this area of medicine – subsequently Mrs Gatty campaigned actively for the use of chloroform in childbirth by women in her parish. See Christabel Maxwell, *Mrs Gatty and Mrs Ewing* (London: Constable, 1949), 91 and 100–101. Dried *Laminaria stipes* or 'tents', for example, have been found effective in promoting the dilation of the cervix, enabling greater ease of access for examination and treatment. See Janet R. Stein and Carol Ann Borden, 'Causative and beneficial algae in human disease conditions: a review', *Phycologia* 23,4 (1984), 494. Certainly, *Laminaria* was in frequent use in mainstream gynaecology by the 1860s and 1870s. See Burritt W. Newton, 'Laminaria Tent: Relic of the Past or Modern Medical Device?' *American Journal of Obstetrics and Gynaecology*, 113 (1972), 442–8.

² Today the study of seaweeds is more commonly known as 'phycology' than 'algology'.

³ E. A. Allom [Elizabeth Anne Allom of Margate, Kent (fl. 1840s–1870s)], *The Sea-Weed Collector, An Introduction to the Study of the Marine Algae, with Directions from Practical Observations on the Best Method of Collecting and Drying the Weed. Illustrated with Natural Specimens from the Shores of Margate and Ramsgate* (Margate: Printed by T. H. Keble, 1841); *The Little Marine Botanist; or, Guide to the Collecting and Arranging of Sea-Weed*, by the author of 'The Little Entomologist' (London: Darton and Clark, [1842]) [the fourth section of a delightful collection of five books published in a single volume, measuring only 8cm wide by 9.5cm long, entitled *The Little Book of Nature. Comprising the Elements of Geology, Mineralogy, Conchology, Marine Botany and Entomology*]; Anne Pratt, *Chapters on the Common Things of the Sea-Side* (London: Society for Promoting Christian Knowledge, 1850); Isabella Gifford, *The Marine Botanist; an Introduction to the Study of Algology, Containing Descriptions of the Commonest*

British Sea-Weeds, and Giving the Best Method of Preserving them, with figures of the most Remarkable Species [1848], 2nd edn (London: Darton; Bath: Binns and Goodwin, 1851); Louisa Lane Clarke, *The Common Seaweeds of the British Coast and Channel Islands; with some insight into the Microscopic Beauties of their Structure and Fructification* (London: Frederick Warne, 1865). Further popular contributions were offered by J. Cocks, M.D. [John Cocks (1787–1861)], *The Sea-Weed Collector's Guide: Containing Plain Instructions for Collecting and Preserving, and a List of All the Known Species and Localities in Great Britain* (London: John Van Voorst, 1853), [Philip Henry Gosse and Emily Bowes Gosse], *Sea-Side Pleasures* (London: Society for the Promotion of Christian Knowledge, 1853); Philip Henry Gosse, *A Sea-Side Holiday* (London: John Van Voorst, 1856); Samuel Octavus Gray [(1828–1902)] *British Sea-Weeds: An Introduction to the Study of the Marine Algae of Great Britain, Ireland, and the Channel Islands* (London: L. Reeve and Co., 1867); Rev. Robert W. Fraser, *The Seaside Naturalist: Out-door Studies in Marine Zoology and Botany, and Maritime Geology* (London: Virtue and Co., 1868). [3rd edn of a work formerly entitled *Seaside Divinity*]; the Tottenham nurseryman and journalist, Shirley Hibberd [James Shirley Hibberd (1825–1890)], *The Seaweed Collector: A Handy Guide to the Marine Botanist Suggesting What to Look for, and where to go in the Study of the British Algae and the British Sponges* (London: Groombridge and Sons, 1872); Henry Scherren, *Ponds and Rock Pools: with Hints on Collecting for and the Management of the Micro-Aquarium* (London: The Religious Tract Society, 1894); George Murray, *An Introduction to the Study of Seaweeds* (London: Macmillan and Co., 1895). Dates for author's lives confirmed using standard botanical reference book: Ray Desmond, with the assistance of Christine Ellwood, *Dictionary of British and Irish Botanists and Horticulturists: Including Plant Collectors, Flower Painters and Garden Designers* (London: Taylor and Francis and the Natural History Museum, 1994).

⁴ GE Journal, Ilfracombe, 8 May–26 June 1856 (entitled by Eliot 'Recollections of Ilfracombe') in *The George Eliot Letters*, ed. Gordon S. Haight, 9 vols (London: Oxford University Press and Geoffrey Cumberlege; New Haven: Yale University Press, 1954), Vol. II, 238–52. Many of the descriptive passages in Lewes's *Sea-Side Studies* were taken verbatim from Eliot's journal.

⁵ Ann B. Shteir, *Cultivating Women, Cultivating Science: Flora's Daughters and Botany in England 1760 to 1860* (Baltimore, MD: Johns Hopkins University Press, 1996), 169.

⁶ Lynn L. Merrill, *The Romance of Victorian Natural History* (New York: Oxford University Press, 1989).

⁷ W. H. Harvey, [(1811–1866)], *The Sea-side Book: Being an Introduction to the Natural History of the British Coasts* (London: John Van Voorst, 1849).

⁸ See Lena Lencek and Gideon Bosker, *The Beach: The History of Paradise on Earth* (London: Pimlico, 1999), 78. Alain Corbin has also produced an exhaustive and fascinating cultural history of the European attraction to, and fear of, the marine environment. *The Lure of the Sea: The Discovery of the Seaside in the Western World* [1988], trans. Jocelyn Phelps (Cambridge: Polity Press, 1994).

⁹ The oldest extant collection is a part of the great herbarium compiled by Sir Hans Sloane, dating from the early eighteenth century, which was to be the foundation of the British Museum collection. This is claimed by George Murray to be the 'earliest authentic evidence' of seaweed collecting. George Murray, *An Introduction to the Study of Seaweeds* (London: Macmillan and Co., 1895), 1–2.

'FREE, BOLD, JOYOUS'

¹⁰ David Allen, 'Tastes and Crazes', in *Cultures of Natural History*, ed. N. Jardine, J. A. Secord, and E. C. Spary (Cambridge: Cambridge University Press, 1996), 397–400.

¹¹ David Elliston Allen, *The Naturalist in Britain: A Social History* (Harmondsworth: Penguin, 1978), 96.

¹² Isobel Armstrong, 'The Microscope: Mediations of the Sub-Visible World', in *Transactions and Encounters: Science and Culture in the Nineteenth Century*, ed. Roger Luckhurst and Josephine McDonagh (Manchester: Manchester University Press, 2002), 30.

¹³ Harvey, *Sea-side Book*, 170.

¹⁴ Charles Kingsley, 'How to Study Natural History' [1846], Volume XIX (*Scientific Lectures and Essays*) of *The Works of Charles Kingsley*, 28 vols (London: Macmillan, 1879–82), 309. Merrill observes that the affection for natural history had spread to all classes from its aristocratic origins by the mid-nineteenth century, *Romance of Victorian Natural History*, 45.

¹⁵ Allom, *Sea-Weed Collector*, 7.

¹⁶ Mrs. Alfred Gatty [Margaret Gatty], *British Sea-Weeds: Drawn from Professor Harvey's "Phycologia Britannica" with Descriptions, an Amateur's Synopsis, Rules for Laying out Sea-weeds, An Order for Arranging them in the Herborium, and an Appendix of New Species* (London: Bell and Daldy, 1863), viii.

¹⁷ See Stella Mary Newton, *Health, Art and Reason: Dress Reformers of the Nineteenth Century* (London: John Murray, 1974), 106–7.

¹⁸ Gatty, *British Sea-Weeds*, viii.

¹⁹ Allen, *The Naturalist in Britain*, 153.

²⁰ Hibberd, *The Seaweed Collector*, 6–7.

²¹ Gatty, *British Sea-Weeds*, x. The emphasis is the author's.

²² Clarke, *Common Seaweeds of the British Coast*, 75. Louisa Lane Clarke (c. 1812–1883) lived and died on Guernsey. Isabella Gifford accused Clarke of plagiarism in respect of lifting the systematic arrangement from her own *Marine Botanist*. Promising that there would be no repetition, Clarke defended herself against the accusation in so far as she claimed she consulted only Landsborough's book and had allowed a 'young friend' to compile the offending descriptions of classes and genera. J. Ardagh, 'Bibliographical Notes: XC. Louisa Lane Clarke and her Writings', *The Journal of Botany* (1928), 174–75.

²³ George Henry Lewes, *Sea-Side Studies at Ilfracombe, Tenby, The Scilly Isles, and Jersey* (Edinburgh: William Blackwood and Sons, 1858), 16–17.

²⁴ [Philip Henry Gosse and Emily Gosse], *Sea-Side Pleasures* (London: Society for the Promotion of Christian Knowledge, 1853), 2. The SPCK carried titles by both Gosse and Anna Pratt. Founded at the end of the seventeenth century, by 1867 the SPCK had become a major publishing venture producing in excess of eight million pieces of literature per annum. As well as explicitly religious tracts, the Protestant SPCK published general knowledge books, deliberately marketed in cheap editions to render them affordable to poorer readers. See Richard D. Altick, *The English Common Reader: A Social History of the Mass Reading Public 1800–1900* (Chicago: University of Chicago Press, 1957), 102–3. Gosse also published by John Van Voorst of Paternoster Row with whom he struck up a relationship as a valued best-selling author and personal acquaintance. See Ann Thwaite, *Glimpses of the Wonderful: The Life of Philip Henry Gosse* (London: Faber and Faber, 2002), 101–3. Van Voorst also carried titles by William Henry Harvey

and John Cocks. The other leading specialist natural-history publisher of the mid-nineteenth century was Lovell Reeve & Co., of Covent Garden which offered an extensive catalogue during the 1850s, including such aquatic writers as William Henry Harvey, David Landsborough, Agnes Catlow and, later, Samuel Gray. See *Hodson's Booksellers, Publishing and Stationers Directory 1855*, a facsimile of the copy in the Bodleian Library, Oxford, with an introduction by Graham Pollard (Oxford: Oxford Bibliographical Society, Bodleian Library, 1972). However, it was George Routledge who secured the enviable publishing rights for the most lucrative but improbable Victorian best-seller – the Rev. J. G. Wood's *Common Objects of the Country* which sold an outstanding 100,000 copies in a week in 1858. Lynn Barber, *The Heyday of Natural History: 1820–1870* (London: Jonathan Cape, 1980), 14.

²⁵ Gosse and Gosse, *Sea-side Pleasures*, 7.

²⁶ Merrill, *Romance of Victorian Natural History*, 80.

²⁷ There are several accounts of exceptions in the form of a minority tradition of women naturalists who, though rarely professionals or expedition leaders, became global travellers and adventurers, most notably Mary Kingsley, who made a significant contribution to the European exploration of Africa. See Mary Russell, *The Blessings of a Good Thick Skirt: Women Travellers and Their World* [1986] (London: Flamingo/Harper Collins, 1994) and Barbara T. Gates, *Kindred Nature: Victorian and Edwardian Women Embrace the Living World* (Chicago: University of Chicago Press, 1998). The presence of the colonial endeavour also sometimes comes down to us in the minutiae of seaweed preservation and arrangement. In their appendices, Pratt and Clarke detail the camel-hair brush, the porcupine quill and isinglass among the requisite paraphernalia. Samuel Gray commends the usefulness of the mahogany thumb-screw press for preserving specimens, *British Sea-weeds*, 30.

²⁸ Margaret Gatty, *Parables from Nature*, with a short memoir of the author by her daughter, Juliana Horatia Ewing (London: George Bell and Sons, 1888). See Ewing's 'Memoir', xxvii.

²⁹ Gatty, *British Sea-Weeds*, xii.

³⁰ *Ibid.*, xiii.

³¹ *Ibid.*, xiii.

³² *George Eliot Letters*, II. 243.

³³ Lewes, *Sea-Side Studies*, 25.

³⁴ Quoted in Maxwell, *Mrs Gatty and Mrs Ewing*, 97. 'D. G.' refers to Margaret Gatty's third daughter, Dot Gatty.

³⁵ Catherine Cutler (1784–1866) who gave her name to the brown algal genus, *Cutleria*.

³⁶ Ruth Formanek, 'Why They Collect: Collectors Reveal Their Motivations', *Journal of Social Behavior and Personality*, 6,6 (1991), 275–86 (277), particularly drawing upon the work of S. A. Mitchell, *Relational Concepts in Psychoanalysis* (1988). A idea of the practical functioning of such networks is conveyed by the specimen of the extremely rare *D. augustissima* which W. H. Grattan tells us was donated to him by John Cocks who had in turn received it from Amelia Griffiths who had collected it earlier in the century. W. H. Grattan, *British Marine Algae: Being a Popular Account of the Seaweeds of Great Britain, Their Collection and Preservation* (London: 'The Bazar' Office, [circa. 1873–74]), 129.

'FREE, BOLD, JOYOUS'

- ³⁷ Mrs. Alfred Gatty [Margaret Gatty], *Waifs and Strays of Natural History* (London: Bell and Daldy, 1871), 88.
- ³⁸ Gatty, *Waifs and Strays*, 78.
- ³⁹ Maxwell, *Mrs Gatty and Mrs Ewing*, 138.
- ⁴⁰ Gifford, *Marine Botanist*, v.
- ⁴¹ Clarke, *Common Seaweeds of the British Coast*, 5 and 137.
- ⁴² Londa Schiebinger, 'Gender and Natural History' in Jardine et al., *Cultures of Natural History*, 163–4.
- ⁴³ Gates, *Kindred Nature*, 74.
- ⁴⁴ See Ann B. Shteir, 'Linnaeus's Daughters: Women and British Botany' in *Women and the Structure of Society: Selected Research from the Fifth Berkshire Conference on the History of Women* ed. by Barbara J. Harris and JoAnn K. McNamara (Durham, NC: Duke University Press, 1984), 67–73 (68).
- ⁴⁵ Gatty, *British Sea-Weeds*, xii.
- ⁴⁶ Hibberd, *The Seaweed Collector*, 8.
- ⁴⁷ Maxwell, *Mrs Gatty and Mrs Ewing*, 99.
- ⁴⁸ Londa Schiebinger, *Nature's Body: Gender in the Making of Modern Science* (Boston, MA: Beacon Press, 1993), 210.
- ⁴⁹ Phycology has since remained an area of natural science in which women (such as Lily Newton, Kathleen Drew-Baker and Irene Manton) have been dominant. When the British Phycological Society was founded in 1953, the first committee largely consisted of women members (information provided by Dr Juliet Brodie of the Natural History Museum).
- ⁵⁰ Robert Kaye Greville [1794–1866], *Algæ Britannicæ, or Descriptions of the Marine and Other Inarticulated Plants of the British Islands, Belonging to the Order Algæ; with Plates Illustrative of the Genera* (Edinburgh: Maclachlan & Stewart, 1830), xv. Greville was an independent writer, lecturer and collector who published on many aspects of natural history, specialising in seaweeds and other cryptogamous plants, insects and freshwater molluscs. He was also a poet and a social reformer who campaigned extensively on issues such as anti-slavery and temperance, becoming M. P. for Edinburgh in 1856. [*Dictionary of National Biography*].
- ⁵¹ Greville, *Algæ Britannicæ*, vi.
- ⁵² Landsborough, *Popular History of British Sea-Weeds*, v–viii.
- ⁵³ *Ibid.*, 8. Professor Agardh, a member of the algological establishment, even named an entire genus – *Griffithsia* – in her honour.
- ⁵⁴ J. R. Hulme [(fl. 1840s)], *The Scarborough Algae* (Scarborough: W. W. Theakston, 1842), iii.
- ⁵⁵ See Allen, *Naturalist in Britain*, 166.
- ⁵⁶ Charles Kingsley, *Glaucus; or, The Wonders of the Shore* [1855], *The Works of Charles Kingsley*, Vol. V. 40.
- ⁵⁷ Shteir, *Cultivating Women, Cultivating Science*, 169. The consolidation of the masculine world of the professional body and the scientific periodical is connoted by the creation of the word 'scientist' by William Whewell as late as 1840.
- ⁵⁸ Hibberd, *The Seaweed Collector*, 1.

⁵⁹ Johann Nave, *A Handy-Book to the Collection and Preparation of Freshwater and Marine Algae, Diatoms, Desmids, Fungi, Lichens, Mosses and other of the Lower Cryptogamia with instructions for the formation of an herbarium*, translated and edited by the Rev. W. W. Spicer, fellow of the Royal Microscopical Society (London: Robert Hardwicke, 1867), 92.

⁶⁰ Rebecca Stott, *Theatres of Glass: The Woman who Brought the Sea to the City* (London: Short Books, 2003).

⁶¹ While this mania had long since diminished, Henry Scherren records that such was the demand for seawater from amateur marine naturalists at the close of the century that the Great Eastern Railway Company would still 'deliver three gallons for sixpence, within a reasonable distance of any of their stations', Scherren, *Ponds and Rock Pools*, 194.

⁶² Gatty, *British Sea-Weeds*, vii.

⁶³ Pratt, *Chapters on the Common Things of the Sea-Side*, 2. Pratt's reference is almost certainly to Dr William Cullen (1710–1790), the Scottish physician and clinical lecturer.

⁶⁴ Gatty, *British Sea-Weeds*, vii.

⁶⁵ *Ibid.*

⁶⁶ See Maxwell, *Mrs Gatty and Mrs Ewing*, 100: 'I have earned £3 in cash for my charity purse, and I can tell you it is *something*. I have half crowns and blankets at my fingers' ends, so to speak.' Later, proceeds from her tales, many of them based on natural history, were used to raise money for the Great Ormond Street Hospital for Sick Children. Gatty, *Parables From Nature*, Ewing's 'Memoir', xxiii.

David Landsborough also promoted 'a pretty album', containing about fifty specimens of Scottish Algæ, entitled 'Treasures of the Deep', prepared by his daughters to raise money for charity. Rev. D. Landsborough, *A Popular History of British Sea-Weeds: Comprising their Structure, Fructification, Specific Characters, Arrangement, and General Distribution, with Notices of some of the Fresh Water Algæ* [1849], 2nd edn (London: Reeve and Benham, 1851), 172–3.

⁶⁷ Pratt, *Chapters on the Common Things of the Sea-Side*, 145.

⁶⁸ Edmund Gosse, *Father and Son: A Study of Two Temperaments* [1907] (London: Penguin Books in association with Heinemann, 1949), 110–11. Philip Henry Gosse lived 1810–1888.

⁶⁹ See David Elliston Allen, *The Victorian Fern Craze: A History of Pteridomania* (London: Hutchinson, 1969), 53–5.

⁷⁰ Hibberd, *The Seaweed Collector*, 33.

⁷¹ Charles Kingsley, *The Water Babies and Selected Poems* [1863], with an introduction by David Davies (London: Collins, 1954), 130–32.

⁷² Hibberd, *The Seaweed Collector*, 1–3.

⁷³ Eliot would have undertaken the journey as far as Barnstaple on the new North Devon Railway from Exeter, which opened in 1854, when she travelled to Ilfracombe in 1856. Southern E-Group Web Site. Available 4 January 2005: <http://www.semgroup.org.uk/location/bideford_01.html>.

⁷⁴ *George Eliot Letters*, II, 244.

⁷⁵ Gatty, *British Sea-Weeds*, vii.

⁷⁶ Shteir, *Cultivating Women, Cultivating Science*, 185.

'FREE, BOLD, JOYOUS'

⁷⁷ Clarke, *Common Seaweeds of the British Coast*, 112.

⁷⁸ Allen, *Victorian Fern Craze*, x.

⁷⁹ Werner Muensterberger, *Collecting An Unruly Passion: Psychological Perspectives* (Princeton, N.J.: Princeton University Press, 1994).

⁸⁰ Muensterberger, *Collecting*, 33. This idea of adventure and 'magical-romantic pursuit' is explicit in the enthusiasm of the anonymous author of a guide published in a series of 'Indispensable Handy Books':

Marine Botany peoples the wild sea-shore, and sings to me strange histories and adventures; even the smallest sea-weed which the waves have brought from out its ocean-bed whispers concerning depths that no human eye has seen, nor the boldest adventurer ever trod.

Marine Botany and Sea-Side Objects; Embracing Every Feature of Interest Connected with this Delightful Sea-Side Recreation; and Illustrated with Many Charming Specimens (London: Ward & Lock, 1861), 13

⁸¹ Lewes, *Sea-Side Studies*, 14.

⁸² Landsborough, *A Popular History of British Sea-Weeds*, 338.

⁸³ Clarke, *Common Seaweeds of the British Coast*, 73.

⁸⁴ *George Eliot Letters*, Letter to Sara Sophia Hennell, 29 June 1856, II. 256.

⁸⁵ Gatty, *British Sea-Weeds*, xi.

⁸⁶ Arne Naess, *Ecology, Community and Lifestyle*, [1989], trans. and introd. David Rothenberg (Cambridge: Cambridge University Press, 1992), 37–8.

⁸⁷ Pratt, *Chapters on the Common Things of the Sea-Side*, 135.

⁸⁸ Rev. Robert W. Fraser, *The Seaside Naturalist*, 20–21.

⁸⁹ Kingsley, 'How to Study Natural History', 301.

⁹⁰ Kingsley, *Glaucus*, 55. Francis O'Gorman provides an analysis of *Glaucus* as an imperialist text in 'Victorian Natural History and the Discourses of Nature in Charles Kingsley's *Glaucus*', *Worldviews*, 2 (1998), 21–35.

⁹¹ Gates, *Kindred Nature*, 169–70. Mary Louise Pratt, *Imperial Eyes: Travel Writing and Transculturation* (London: Routledge, 1992).

⁹² Hibberd, *The Seaweed Collector*, 1.

⁹³ Gatty, *Waifs and Strays*, 87.

⁹⁴ See Foucault on this cosmic 'interplay of resemblances' in Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* [1966], trans. from the French (London: Tavistock, 1970), 25–30 and Keith Thomas, *Man and the Natural World: Changing Attitudes in England 1500–1800* (Harmondsworth: Penguin, 1984), 84.

⁹⁵ Pratt, *Chapters on the Common Things of the Sea-Side*, 153.

⁹⁶ Louisa Lane Clarke, *The Microscope: Being a Popular Description of the most Instructive and Beautiful Objects for Exhibition* (London: G. Routledge and Co., 1858), 184.

⁹⁷ Hibberd, *The Seaweed Collector*, 1.

⁹⁸ *Ibid.*, 3.

⁹⁹ Gifford, *Marine Botanist*, vii.

¹⁰⁰ James A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: University of Chicago Press, 2000), 526.

¹⁰¹ Rebecca Stott, 'Darwin's barnacles: mid-century Victorian Natural History and the marine grotesque', in *Transactions and Encounters*, ed. by Luckhurst and McDonagh, 168. The insufficiency of the animal-vegetable distinction as an absolute was, Stott notes, observed by Victorian contemporaries such as Agnes Catlow, author of *Drops of Water: Their Marvellous and Beautiful Inhabitants Displayed by the Microscope* (London: Reeve & Benham, 1851), 47.

¹⁰² Harvey, *Sea-side Book*, 14.

¹⁰³ See Maxwell, *Mrs Gatty and Mrs Ewing*, 125–6. Darwin kept company in this rogues' gallery with Voltaire and Tom Paine.

¹⁰⁴ Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction* (London: Routledge and Kegan Paul, 1983), 129.

¹⁰⁵ Beer, *Darwin's Plots*, 194–5.

¹⁰⁶ Landsborough, *A Popular History of British Sea-Weeds*, 80–81.

¹⁰⁷ Line 332 of Pope's *Essay on Man* (1744), *Pope: Poetical Works* [1966], ed. by Herbert Davis (Oxford: Oxford University Press, 1978), 277.

¹⁰⁸ Charles Darwin [1876–1881] and T. H. Huxley [1889], *Autobiographies*, ed. with an introduction by Gavin de Beer (Oxford: Oxford University Press, 1983), 54.

¹⁰⁹ Thwaite, *Glimpses of the Wonderful*, 316.

¹¹⁰ *George Eliot Letters*, II, 251

¹¹¹ Foucault, *The Order of Things*, 131.

¹¹² See Gordon S. Haight, *George Eliot: A Biography* (Oxford: Clarendon Press, 1968), 197, 203 and 206–7.

¹¹³ George Eliot, *The Mill on the Floss* [1860], ed. A. S. Byatt (Harmondsworth: Penguin, 1979), 94. Jeremy Hooker draws particular attention to this passage when identifying a certain mode of closely observed appreciation of the natural world that he terms 'ditch vision'. See 'Ditch Vision', *The Powys Journal*, IX (1999), 14–29 (15).

¹¹⁴ Naess, *Ecology, Community and Lifestyle*, 57–63.

¹¹⁵ For an analysis of the developing influence and integration of scientific theory in Eliot's novels see Sally Shuttleworth, *George Eliot and Nineteenth-Century Science: The Make-Believe of a Beginning* (Cambridge: Cambridge University Press, 1984).