

## A. S. Byatt, Science, and the Mind/Body Dilemma

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From mathematics, genetics and neurosciences in the Quartet novels,<sup>1</sup> natural history and geology in *Possession*, entomology in *Angels and Insects*, taxonomy in *The Biographer's Tale*, to geology and gynaecology in *Little Black Book of Stories*, A.S. Byatt's recurrent foray into scientific domains has become a hallmark of her fiction.

Her journalism offers further proof of the fruitful interactions she perceives between art and science. In "Strange and Charmed", she discusses artistic responses to scientific discoveries. In "The Feeling Brain", she reviews neuroscience scholar Antonio Damasio's book *Looking for Spinoza* and expands on Damasio's concept of the "embodied mind" and its artistic renditions. In "Soul Searching", she uses the neurosciences to investigate literary treatments of the mind/body dilemma. In "Fiction Informed by Science", she describes the way science shaped the stories and characters of the Quartet. In "Observe the Neurones", she approaches John Donne's poetry through neuroscience. In "Novel Thoughts", she explains how science may provide a way out of narcissism in art works as she opposes the conflation of sexuality and identity derived from the prevalence of psychoanalytical thought to "the human capacity to think", especially the cognitive process of symbolizing the body through metaphor.

Byatt is familiar with and cites the works of neurophysiologists Charles Sherrington and Giacomo Rizzolatti, cognitive psychologist Ulrich Neisser, biologist EO Wilson, professor of neurobiology Steven Rose, neuropsychologist Richard Gregory, science philosopher Ian Hacking, philosopher Jean-Pierre Dupuy on cognitive sciences, neuroscientists Jean-Pierre Changeux and V.S. Ramachandran, evolutionary biologists Steve Jones and Richard Dawkins. She has a personal relationship and is in regular conversation with some of those scientists. She has explained, for instance, how she asked Steve Jones for help on her novel *The Whistling Woman* to draw a parallel between the naturalist observation of snails and neuroscience of the brain (Mitchell). Byatt's interest in science stems from her educational background. She was taught science up to the age of 15 when the school decided she should move up a class and would not be able to catch up on chemistry, physics and biology (Mitchell). She then received an arts education which she further pursued at Cambridge.

As June Sturrock remarked in 2003: "Increasingly her writing is concerned with the actual operations of the mind, the brain, whether physical or metaphysical" (Sturrock, 101). Byatt's predominant fascination with neurosciences stems from her literary concern with the workings of metaphors. Before she became a writer, she considered a career as a scholar and started writing a thesis on John Donne and seventeenth-century religious metaphor, which, she says, reflected the period's literary debates on the body/mind dilemma:

When I was a student in the 1950s, we did a lot of thinking – in very literary terms – about the body-mind problem. We were in some sense mesmerised by TS Eliot's notion of the dissociation of sensibility that had taken place in the 17th century, and had somehow wrenched apart language, the body, and the thinking mind (Byatt, 2004).

She has since elaborated further on these initial reflections to include Changeux's work on neuronal work space and Damasio's embodied mind in an essay published in *The Cambridge Companion to John Donne*, of which "Observe the Neurones" is an edited version.

Some reviewers have criticized Byatt's approach. Professor of medicine Raymond Tallis charged her with giving a reductionist perspective on literature through neurophysiology. While Tallis condemns Byatt's scientific conjecture, this article will examine the relevance of her neurological speculations to account for the author's own poetics. Thus when Byatt characterizes Donne as a "pattern-maker with language", she is also shedding light on her own writing procedures based on repeating patterns. In interviews, Byatt is well-disposed towards describing the workings of her writing mind, which she likes to do by resorting to neuronal imagery. Her collections of essays also elucidate the many connections that inform the writing genesis of her novels and short stories. This article combines an illustrated overview of Byatt's fictional appropriation of science with a survey of her essays and newspaper articles on neurophysiology and her reflections on her own thought processes to demonstrate the significance of science in her writing praxis. While Byatt is regularly criticized by reviewers for her overambitious intellectuality, this article proposes instead to consider her scientific erudition as the matrix of her writing process which deliberates the body/mind dilemma. Through scientific taxonomy, Byatt endeavours to circumscribe the unsymbolized dimension of the body whose representational gap she transcends by means of an erotic engagement with scientific words, thereby also problematizing her own status as a woman writer.

### Taxonomy

First and foremost Byatt is fascinated with the language of science. Scientific nomenclatures are of paramount importance in her texts which regularly feature lists of names. Her attraction for the Linnaean system of classification, which formed the basis of *The Biographer's Tale*, stems from her early reading of Michel Foucault: "I suspect the germ of the novel lies long ago in my own first reading of Foucault's remarks on Linnaeus and taxonomy in *Les mots et les choses*" (*The Biographer's Tale*, 264). What appealed to Byatt was the way Foucault connected the analysis of a scientific method to a theory of language: "Foucault did fit Linnaeus' desire for a complete taxonomy into a view of language and languages" (114). For Foucault, taxonomy is the science of order whose descriptive language aims to reduce the gap between words and things. Foucault's preface in *Order of Things* echoes Byatt's own struggle with the body/mind dilemma. In it, he uses a story by Borges to expose the gap between the taxonomic imposition of order through juxtaposition and the arbitrariness of any categorization which comes as a dislocation of language. Throughout her career, Byatt has endeavoured to fictionalize such an epistemological gap as a representational gap in relation to the body. The body is both enmeshed in language and at the same time its reality overwhelms linguistic attempts at delimiting bodily experiences. The primary function of Byatt's characters' recourse to taxonomy is to keep at bay the terror of biology, to endeavour to circumscribe the body and its terrifying transformations through classification: "Byatt's characters sometimes act as 'taxonomers' as they formulate schematizations that will compile disparate elements into some semblance of coherence" (Gauthier, 29).

In that respect, the short story "A Stone Woman" is particularly edifying as it dramatizes the experience of Ines, a lexicographer, whose body gradually turns to stones. In keeping with her job description, Ines's reaction upon seeing stones sprouting

on her body is to look up their names in the dictionary in a first attempt at making sense of her transformation: "She learned the names of some of the stones when curiosity got the better of passive fear. The flat, a dictionary-maker's flat, was furnished with encyclopaedias of all sorts. She sat in the evening lamplight and read the lovely words: pyrolusite, ignimbrite, omphacite, uvarovite, glaucophane, schist, shale, gneiss, tuff" (*Little Black Book of Stories*, 120). Ines endeavours to adopt the scientific posture of a detached observer when she decides to record her unprecedented transmutation for posterity: "She thought of recording the transformations, the metamorphic folds, the ooze, the conchoidal fractures. Then when 'they' found her, 'they' would have a record of how she had become what she was. She would observe, unflinching" (121).

Such a posture of careful attention and separateness mirrors Byatt's own attitude regarding neurology. She envisages brain sciences both as a way to observe her own thought processes – "Well I'm quite interested in my own mental processes, simply because I'm a failed scientist, and because I'm interested in how the brain and the mind works" (Mitchell) – as well as a way to stand separate – "Looking out at things rather than in at the self" (Mitchell). The scientific posture allows her to dissociate the mind from the body. Thus, in the *Quartet*, Marcus manages to distance himself from the physical pain caused by asthma by resorting to geometry:

There was an extreme point where pain refined vision to mathematics. He would see a two-dimensional map, grey-black-white, of linear relations: curtains, furniture corners, bed, chair, fingers, plucking up triangles of blanket. This was related to the inner map of blocked, narrowing, imagined passages for air. . . . It intensified with pain, and yet the attention could, with effort, be deflected from pain to geometry. Geometry was immutable, orderly, and connected with extremity. (*The Virgin in the Garden*, 118)

The order represented by geometric patterns is similar to the rhythmic structure of poetic language. Mapping out external reality helps chart internal pain so that cataloguing the environment with signifiers supports the effort to structure organic disorder. The process of listing things in their "linear relations" corresponds to the inception of Byatt's own creative process. In the labour scene from *Still Life*, Stephanie likewise manages to keep at bay contraction pains by focusing on their cadenced pattern and relating them to the recitation of a poem by Wordsworth:

The next pain, when it came, was possible to weave into the rhythm of this tramping, to time between wall and wall and back again. She began to observe it almost from outside, listening to its rise and fall, letting it make its way. The adrenalin, lost with the enema, flooded back. She tried to recall the 'Immortality Ode' which was yet another rhythm. The Rainbow comes and goes. And lovely is the Rose. She strode on. (110)

In her fiction, Byatt problematizes the dilemma of the "embodied mind" in that she regularly depicts the terror of physical pain for the mind trapped in the body. She dramatizes the clash between the self-reflexive subject/cogito, able to draw symbolic connections between poetry and geometry, and the intrusion of the real unsymbolized body which taxonomy endeavours to restrain. It is significant, in that respect, that Byatt should equate physicality with rationality when evoking the pleasure of reading Donne based on Changeux's theory of mental objects: "The pleasure Donne offers our bodies is the pleasure of extreme activity of the brain" ("Observe the Neurones"). Byatt invests

mental processes with a gratifying organicity as if to ward off the real of the suffering, decaying body. Similarly, when depicting her own creative process, she connects her neurons with her guts, making the brain and cerebral activity into a sensory organ recalling the title she gave to Damasio's review, "The Feeling Brain": "I think my characters with my guts. But when I say I think them, that is what I do, I feel them with the sympathetic neurons and I work out with my brain what it is that I am trying to write about, or I can't do it" (Mitchell).

Analyzing mental processes through neurobiology is akin to trying to circumscribe the body with taxonomy. Byatt displaces the apprehension of the body as an unsymbolized whole through metonymic fragmentation. Thus, when Byatt examines Donne's poem "A Valediction: Forbidding Mourning" by pointing out how "Again, in this poem, the disembodying of the body has been carried out by a list of nouns" ("Observe the Neurones"), she is also shedding light on her own endeavour to put the body at a distance through naming. Nouns enable her to fragment the body into parts whose geometric arrangement into "repeating patterns" transforms it into an "impersonal object" as Marcus' depiction of the butcher's stall demonstrates:

In front of these, cuts and joints. A Bath chap, sliced and pushed into a regular cone, coated with golden crumbs, glistening in its cellophane wrapper, a neat, impersonal object. Lamb cutlets in neat lines, a repeating pattern, pink flesh, white fat, opalescent bone, parallel lines, identical uneven blocks, achieving a kind of abstract regularity through the repetition. (*The Virgin in the Garden*, 120)

Geometric ordering through the juxtaposition of nouns allows Byatt's characteristic "repeating patterns" to emerge whose gyration spans the gap of the butchered body. Physical depictions in her work are quite often affiliated to butchery as well as medical imagery, most strikingly in the depiction of the giant worm in "The Thing in the Forest", a concrete representation of the war trauma: "the colour of flayed flesh . . . every colour, from the green of mould to the red-brown of raw liver, to the dirty white of dry rot. . . . it was made of rank meat . . . but it also trailed prostheses of man-made material" (*Little Black Book of Stories*, 14-15). Her propensity to draw taxonomic lists also materializes itself in the recurrent use of collections, as illustrated in particular by a variety of curio cabinets, which amalgamate body parts under a scientific system. In *The Virgin in the Garden*, Marcus depicts one such cabinet in his biology classroom:

A case contained things in bottles – Kilner jars like those in which his mother preserved gluts of Victoria plums or unripe fallen apples and pears. Jam-jars, test-tubes. Dozens of fetuses. . . . Larger round-bellied ratlings, cord and placenta attached, flat-headed unborn cats, pallid flesh, unformed eyes closed against the glass wall and the light. (*The Virgin in the Garden*, 160)

In the following lines, Marcus proceeds to describe the anatomical boards detailing a man and a woman's skeletons, muscles, organs, and finally their flesh styled as "the thing itself" (161). Through scientific observation, Marcus' perception circumscribes the horror of birth, with the comparison between the foetuses in jars and his mother's preserves, as well as the terror of sexuality as Marcus' complex relationship to his own corporality is further aggravated by the enforced performance of Ophelia in the school's play and the paedophilic relationship imposed on him by his biology teacher whose own scientific discourse is deranged. Similarly in the short story "Body Art", the list of

items in a hospital's collection of medical antiques (*Little Black Book of Stories*, 72-73) serves as a *mise en abyme* of the main character's conundrum: a gynaecologist and a lapsed Catholic, he struggles with the concept of the body's resurrection as his medical vocation leads him to view the crucified body of Christ as a putrescent body while he is concurrently puzzled by his lover's pierced body. His horror of relics, both medical and sacred, testifies to "the overpowering awareness of the physicality of the human body . . . which, in spite of its ultimate acceptance of the fact that the symbolic lies coiled in our *language*, insists that – stripped of symbolic meaning and pared down to its basic physical components – human *existence* is essentially a matter of flesh and blood" (Alfer and Edwards de Campos, 58). Writing thus comes as a suture over the gaping thingness of the body.

The variety of Byatt's recourse to such opposite epistemological tools as taxonomy, entomology, botany, all pertaining to "the age of the catalogue" (Foucault, 143), and anatomy, biology, and neurobiology, testifies to her endeavour to bridge the gap opened by the beginning of nineteenth-century history defined by Foucault as "substituting anatomy for visible character, organism for structure, internal subordination for visible character, the series for tabulation" (Foucault, 150). Byatt could be said to attempt herself a change of paradigm as she similarly proceeds to substitute science for the sexualized body in order to challenge the social constructs of female identity. Her gendered experience as a woman writer informs her use of science as the repeating patterns in her work are also designed to metamorphose the socio-symbolic patterns imposed on women. By resorting at one and the same time to linear juxtaposition and diachronic metafiction, continuity and disruption, she attempts to elaborate new myths.

### Sexuality

In a metafictional passage from *Still Life* about the names of grasses, later taken up again in an essay from *Passions of the Mind*, Byatt contrasts her own fascination with classification with Sartre's nausea at the namelessness of a tree and explains about naming things that "to write language about their thingness can be to comment on the doubleness of a metaphor that is both mimetic and an exploration of the relation between identity and difference" (*Passions of the Mind*, 9). In both the essay and the novel, the dizzying array of references she invokes illustrates "the overwhelming human need to make connections" (*Still Life*, 365). Both texts are haunted by the issue of incarnation and sexual difference.

In *Passions of the Mind*, Byatt sheds light on the "ruling metaphor" of her novel *Still Life*: "a metaphor of metamorphosis – of flesh into stone, or of flesh into grass – . . . Human passion frozen into works of art . . . I played with the clichés: 'You can't get blood out of a stone.' Or, 'All flesh is grass'" (4). In the novel, Marcus again calls on memories of his mother and, interestingly enough, mentions "neuter" flowers "without either stamens or pistils" which relate to his wish to escape sexual identity, and ends his reflections with the depiction of the bee orchid, "that trap in the form of a female bee that invites the agitated male to grasp, to penetrate, to shake on the flower-flesh" (366). Although, in the case of Marcus, this leads to a paralysis of the self, the depiction of his synesthetic experiences and his geometric ordering of the world bear some resemblance to Byatt's own thought process:

I think simultaneously with a sort of map of visual objects—and when I say visual they are semi-visualised. If I'm really interested in particular ones I can make them more visual and the sort of basic model of all that is a kind of

on the whole spherical, certainly three dimensional object which is the work of art I'm trying to make, which is made up of sort of several layers of spider webs or netting which are knotted together at all sorts of points. (Mitchell)

Marcus' endeavour to become neuter, his scientific posture of distant observation, runs parallel to the bloodless flesh made stone which dramatizes Byatt's conundrum as a female writer, the conflict "between a female destiny, the kiss, the marriage, the child-bearing, the death, and the frightening loneliness of cleverness, the cold distance of seeing the world through art, of putting a frame round things" (*On History and Stories*, 156). Marcus thus offers a sort of inverted self-portrait of the creative artist: while for Marcus, science is a way out of the terror of the sexualized body, it allows Byatt to display the body/mind dilemma by displacing the question of sexual difference. Her use of geology, in particular, along with the recurring images of stone women in her work, is evidence that science represents Byatt's endeavour to work through her female identity in relation to art. Trying to pin down the ontological gap between words and things through nomination – Byatt writes: "Words are literally things" (*Passions of the Mind*, 4) – corresponds to her parallel endeavour to deal with the representational gap of sexual difference.

Many of her stone women represent a wish to escape the biological as well as the cultural fate of women: "The frozen, stony women became my images of choosing the perfection of the work, rejecting . . . the imposed biological cycle, blood, kiss, roses, birth, death, and the hungry generations" (*On Histories and Stories*, 164). In *The Virgin in the Garden*, Elizabeth I is a representative of female autonomy, standing alone, the virgin queen "the flower of the field", untouched, unmarried, "ever the same": "Tudor rose, blood, flesh, marble, a spring shut up, a fountain sealed, *ego flos campi*, not to be cut off by the butcher. . . . Elizabeth would not bleed. She would neither be butchered nor marry. She would be a stone that did not bleed, a Princess, *semper eadem* and single" (130). The metaphor of the "fountain sealed" is repeated in *Possession* in the title of Randolph Ash's poem dedicated to his frigid wife Ellen as well as in Christabel's Fairy Epic where Melusine's fountain is "concealed". The scholars, Maud and Roland, both express a wish to substitute geology for sexuality. Maud remarks that "The whole of our scholarship – the whole of our thought – we question everything except the centrality of sexuality – Unfortunately feminism can hardly avoid privileging such matters. I sometimes wish I had embarked on geology myself" (*Possession*, 222). This anticipates Roland's thoughts in Yorkshire: "He had a vision of the land they were to explore, covered with sucking human orifices and knotted human body-hair. He did not like this vision, and yet, a child of his time, found it compelling, somehow guaranteed to be significant, as a geological survey of the oolite would not be" (*Possession*, 246).

Byatt's work with the nouns of science as well as her consistent, blatant display of erudition, aims to challenge gendered constructs regarding female passivity and incapacity. Just as she "refuses to accept the division between feeling and intellect, she refuses to accept the division between the 'two cultures' of science and the arts, a division taken for granted at the time and place at which she was educated" (Sturrock, 101). She fights against sexist misconceptions about women writing learned fiction. Thus, in the speech she gave upon receiving the James Tait Black Memorial Prize for *The Children's Book* in 2010, she denounced how "If you are trying to think, there are always reviewers who take the attitude that it's like a dog standing on its hind legs, as Samuel Johnson put it: it would be better if you didn't do it" (Higgins and Davies). *The Children's Book* also features stone women with Olive impersonating Hermione in a production of *The Winter's Tale*, or Imogen and Pomona, who solidify against paternal

incest. The female incarnations parallel the book's overall thematic around clay modelling and raise the issue of social constructions. The body/mind dilemma represented by the paradox embodied in her stone women of unviolated statuary and living metamorphosis (Ines becomes a lively troll woman in a parody of the Ovidian myth of Pygmalion) parallels a similar double stance of biological denial and mythological enfranchisement in relation to the status of the woman artist.

The recurring figure of Marsyas and the passage from Dante describing the flaying of the satyr, "della vagina delle membre sue", emphasize the painful predicament of the "embodied mind". Byatt first used this in *The Virgin in the Garden* when elderly Crowe, who presides over Frederica's incomplete and unsatisfactory deflowering, delivers an Ovidian ekphrasis of Jacopo's representation of suspended disintegration:

Crowe explained, with glee, that it was Jacopo's subtlest and nastiest work, . . . like Ovid's Marsyas an image of pain on the point of disintegration, the body after flaying but still, for a brief moment, holding its terrible shape. . . . 'It is very painful. It is lovely. It is the moment of the birth of the new consciousness. Marsyas cried out to Apollo: *quid me mihi detrahis*. Why do you tear me from myself. And Dante prayed to be so torn. Apollo should deal with him "si come quando Marsia traesti: Della vagina delle membre sue." As when thou didst tear Marsyas from the sheath of his members. A metamorphosis, yet again. The shining butterfly of the soul from the pupa of the body. Lava, pupa, imago. An image of art.' (186)

Similarly, the quote appears in the short story "Arachne", a metafictional rewriting of Ovid's tale mixing entomological depictions of spiders, art history ekphrasis and an intertextual web of literary references. The short story, which Jean-Louis Chevalier qualified as Byatt's "auctorbiography" (Chevalier, 19), indeed reads as an elucidation of the author's own writing praxis, whose "precise imagination" like Ovid's "inhabits a painfully changing body" (*Ovid Metamorphosed*, 144). Byatt thus draws a self-portrait of the artist as imprinting her signature on the torn sheath of the martyred body, as in Michelangelo's painting: "There was also, in the side-chapel, a bad blown-up reproduction of Michelangelo's depiction of the martyr descending ferociously in the Sistine clouds of judgement, brandishing his knife above his head and trailing his dead leathery integument, on which the artist's distorted face was depicted" (*The Virgin in the Garden*, 496), "Michelangelo's St Bartholomew dangles his flayed skin from his fingertips; the folded, hanging face is Michelangelo's own" (*Ovid Metamorphosed*, 134). The transcription of the original Italian words from Dante, consistent with Byatt's overall lexicographic precision, significantly shine light on the term "vagina", highlighting the tension between the female body and the creative mind. Like a Penelopeian Arachne, whose name she uses as a moniker in her e-mail address (Leith), Byatt both weaves complex analogical patterns at the same time as she unties the knots of interpretation through metonymic spinning.

She carries out the "disembodying of the body" through scientific nomenclature while obsessively painting it through poetry. The writer figure of Frederica exemplifies this double movement in Byatt's own writing. The concept of laminations as fragmented bits of knowledge stored separately in different parts of the brain reflects Frederica's difficulties with the many facets of her life:

Frederica decides to use a mental strategy in order to keep the positive and negative aspects of her life separate, terming the various layers of thought "laminations". When asked about this concept, Byatt stated that she herself used this strategy when young, as part of her "desire to connect everything I see to everything else I see". Franken states that Byatt describes 'lamination' as 'a strategy for survival' which goes a long way to explain how difficult it must have been for her to reconcile her identity as a woman with her intellectual aspirations in the 1950s. (Hicks, 100)

Frederica will finally be able to assemble them in a collage so that "Byatt's models for the birth of the laminated writer/self are neurological as well as iconological" (Stewart, 499). The early layering of "geological strata" (*Babel Tower*, 312) in Byatt's work that lay the emphasis on the connectedness of separate things would later be complemented by a more fully integrated organic approach to poetic language derived from the evolution of cognitive neurosciences – Damasio's "embodied mind" – exemplified for instance by her recourse to the notion of parthenogenesis in *Possession* and *A Whistling Woman*. Alastair Brown's recapitulation of Byatt's article "Fiction Informed by Science" clearly shows the gradual unification of biology and perception in her work:

In an article for *Nature* entitled "Fiction Informed by Science," Byatt elaborates on the central scientific motifs around which the novels of the quartet were structured: the synaesthetic solving of mathematical problems through visualising landscapes in *The Virgin in the Garden* (1978); the nature of perception in *Still Life* (1985); the Fibonacci spiral in *Babel Tower* (1986); and synaptic and biological connections and patterns in *A Whistling Woman* (2002). (Brown, 56)

Increasingly, Byatt has thus endeavoured to develop an organic approach to poetic language.

### Body Art

At the same time as she fragments the body through scientific glossary, the surgical precision of her descriptions breathes organicity back into the poetic language used. Her use of adjectives especially contributes to the distinct carnation of her reincarnations. She professes her interest in "the abused and despised adjective, that delimiter of plain nouns which, if properly used, makes every description more and more particular and precise" (*Passions of the Mind*, 11), "those unfashionable categorizers" (*The Virgin in the Garden*, 364). Her "verbal still lifes" (Hicks, 115) embody the conflict between her characters' wish to escape biology through nominal petrification and the anatomical jubilation of adjectival accretions. Accuracy determines Byatt's writing practice so that the denotative lists of scientific words metamorphose into libidinal objects through metaphoric connotations: "If you don't know any entomology, you shouldn't be writing metaphors about butterflies because they will be boring metaphors. The source will be only within" (Chevalier, 26). In a parody of Freud's demonstration that mathematics and geometry act as a diversion from sexuality (Freud, 31), Byatt relocates carnality in the very fabric of erudite words.

"A Stone Woman" articulates the exhibition of the metaphoric web informing the etymology of obscure scientific terms: "The human world of stones is caught in organic metaphors like flies in amber. Words came from flesh and hair and plants. Reniform, mammilated, botryoidal, dendrite, haematite" (*Little Black Book of Stories*,

126). The "still-life listings" (Hicks, 114) created by the sedimentary accumulation of geological terms eroticize the disembodying of the body so that Ines' petrifying flesh can metamorphose into a geomorphic wonder. Maragarida Esteves Pereira is right in her estimation that Ines' "new female identity . . . seems to be created at the expense of the female body, whose transformation seems to be the condition for female liberation" (Esteves Pereira, 188), because Byatt substitutes geology for gynaecology so that "the woman is present, as often in Donne, in a string of nouns" ("Observe the Neurons"). Thus, the eroticism of Ines disrobing in front of sculptor Thorsteinn is displaced onto the linguistic striptease of the scientific words' etymological connotations. They are akin to Donne's "erotic lists" ("Observe the Neurons"). Ines' grotesque body is made visible by the erudite words which the reader comes to contemplate like sculptures as their very strangeness defies both signifier and signified. The "mysterious flesh" ("Fiction informed by science") is embodied in the defeat of the sign as only the letters remain to be gazed at like skeletal structures.

The disembodying of the body figures the unravelling of the metaphorical process itself. In an imitation of Donne and Stevens' *ars poetica*, Byatt looks to expose the very process of meaning-making:

I think I knew even as a schoolgirl that Donne excited me because he was a pattern-maker with language. The other poet who has the same qualities of excitement is Wallace Stevens. . . . I think both Donne and Stevens describe not images, but image-making, not sensations but the process of sensing, not concepts but the idea of the relations of concepts. I like glass because, as Herbert said, you can look at it and through it simultaneously. . . . Donne and Stevens make skeletons of poems ("Observe the Neurons")

Similarly, her plot-making combines the pleasure of storytelling with a self-reflexive approach to pattern-making, which the metaphors of science underscore:

The 'plots [of the late Quartet novels] keep 'dividing and spawning new story lines, as though by narrative parthenogenesis' (Merkin, 2003: 10). This biological image of spontaneous and disorderly growth rather aptly describes a writerly practice that not merely references the sciences but strives to weave scientific thought into the very fabric of fiction" (Alfer, 6).

Byatt claims to rework realism as "self-conscious realism" (*Passions of the Mind*, xv) endeavouring to show that "it was possible for a text to be supremely mimetic, 'true to life' in the Balzacien sense, and at the same time to think about form, its own form, its own formation, about perceiving and inventing the world" (*Passions of the Mind*, 15-16). Her recourse to science in literature, in her consistent endeavour to transcribe the "thingness" of the real, formulates a response to both the "solipsism" of modernism (*Passions of the Mind*, xv) and postmodern self-referentiality:

For the Age of Suspicion led to solipsism, to navel-gazing, to a sense that the inside of our own head was all we could know. This complacent mental misery makes no sense in the world of scientific discovery. We need to feel that there is something real out there – of which we are a part and not the whole – and science reveals it to us in its beauty and its terror and its order and its chaos, bit by fascinating bit, cell by cell, gene by gene, galaxy by galaxy. ("Strange and Charmed")

By substituting science for sexuality, Byatt endeavours to remodel the prevailing paradigms of psychoanalytic and feminist thought to open up new visions of the real of identity and difference. Her pattern-making is an attempt to forego any kind of limitation through perpetual resignification. The writer figure of Roland who emerges at the end of *Possession* by writing "lists of words that resisted arrangement into the sentences of literary criticism or theory" (*Possession*, 431) "emphasises the connection between words and the things they represent, but also the words themselves as things with a history and a presence which resists individual users' manipulation" (Polvinen). His new vision leads to the renewal of his erotic relationship with Maud.

Byatt's pattern-making concerns both narrative and language. Just as "the self-conscious use of familiar styles can enrich, rather than explode, realist story-telling" (Polvinen), the linguistic accuracy of scientific lore is similarly meant to enhance a wealth of metaphoric connections. The self-conscious realist style of her writing thus includes a double movement of indulging in plethoric realist descriptions and self-consciously laying bare the "skeleton" of the meaning-making process. While her ekphrastic style of depiction has been compared to still life, the exhibition of the linguistic process behind it could be paralleled with vanitas as she exposes the bones of language relations. Byatt reworks the domestic component of realism and still life painting through scientific metaphoricity to challenge biological and cultural essentialism: "Perhaps in Byatt's choice of an artistic genre in which canonical male artists excelled, yet which in many ways appeared to suit women more than men, she is subtly pointing out the issue of gender inequality in the genre and signalling her reclamation of female territory" (Hicks, 20). Indeed, she has retrospectively analyzed her interest in the dissociation of sensibility as originating in her own social history: "I see now, as I didn't dare to then, that the mind-body problem of an intellectual woman in the 1950s was also one of rigorous conflict" ("Soul searching"). The *Quartet* was her response to the tension between social reality and intellectual ideality as she explains that "in the last novel of the four a university conference about Body and Mind takes place (in 1969) in which an idealistic vice-chancellor tries to make his university into an undissociated paradise, where all scholars talk to each other, arts and sciences inform each other, humanism unifies body and mind" ("Soul searching").

Her prevailing interest in neurosciences highlights the way her writing attempts to deliberate the conflict between dissociation and connection: "My own writing and thinking have been much influenced by Sir Charles Sherrington's metaphors for mind and brain. . . . Most people know his description of the waking brain (the 'head-mass') as 'an enchanted loom where millions of flashing shuttles weave a dissolving pattern, always a meaningful pattern though never an abiding one...'" ("Soul searching"). "Weav[ing] a dissolving pattern" is what she achieves through the paradoxical combination of Arachne-like webs of metaphoric spinning and Penelope-like metonymic unravelling which defies interpretation.

Such writing procedure can baffle the readers. Throughout her career, reviewers have been divided between praise and criticism of her erudition. Reviews on her essay from 2016, *Peacock and Vine*, in which she parallels the works and lives of William Morris and Mariano Fortuny, offer further proof of such puzzled reception. The connections she draws between the two figures have thus been described as "tangential links" (Murray), "the only significant connection between them" being Byatt's own "synaptic linkage" (Wiersema), while her neuroscientific imagery has been resented as pedantic: "She imagines 'the excitement of the neurones' in her brain, 'pushing out synapses connecting the web of dendrites'. But Byatt struggles to convey these synaptic

goings-on without condescension" (Anon.). In this essay, Byatt delivers yet another insight into the analogical workings of her creative mind along the lines of Sherrington's neurophysiology whose metaphors she loves "because they are accurate – as to their physical origins – the brain-cells are indeed a forest, and are called dendrites from the Greek for trees, the nervous system is indeed a web of flashing electricity" and because "it gives me a way of imagining my own mind-body" ("Soul searching"). Like the reviewers of *Peacock and Vine*, Sue Sorensen is critical of Byatt's analogical thought process as "parallel reasoning, imitative thinking" (Sorensen, 181), which she associates more particularly with science and mathematics in Byatt's work, because "in the main, the analogies can be recognised by their limitations. They name but do not sing" (Sorensen, 187). Indeed, they do not because Byatt's imagination is visual: "I like to write about painting because I think visually. I see my writing as blocks of color before it forms itself. I think I also care about painting because I'm not musical" (Burns). Instead, they are meant for the reader to contemplate the skeletal outline of the letters themselves like the grotesque sculptures in "A Stone Woman".

Mapping out the invisible with the complex weaving of analogical and metaphorical webs while fragmenting the body's integrity with metonymic displacements which figure dissociation allows Byatt to account for the perception of the contemporary world as modified by cognitive sciences and neuropsychology: "Richard Gregory said in the 1960s that we now think about worlds we can neither see nor touch. Marshall McLuhan said we live in a social world of prostheses, things added on to the body - telephone, television, cameras - which drastically change our human relations and perceptions of each other, and ourselves" ("Soul searching"). She reclaims the realist tradition of George Eliot who "wrote novels informed by her understanding and imagination of the nervous system" ("Soul searching") and has updated Eliot's interest in phrenology and modern physiology with today's neurosciences. Like Eliot, who wrote under a male pen name to avoid gender biased reception, Byatt is known and addressed through her initials, A. S., even by her family members (Leith). Like Eliot, whose novel *Middlemarch* offers through "a series of neurological metaphors" a picture of the "social world", "the characters' perceptions, and misperceptions" and "of moral situations" ("Soul searching"), Byatt aims, through analogical thinking, to offer the widest possible view of "the real world", to open up a "plurality of windows" on it (*Still Life*, 334-335). Thus "A girl crosses the courtyard in a yellow dress and can be seen, optically, amorously, medically, sociologically" (*Still Life*, 335). The refractions of multi-faceted world views empower Byatt as a female writer by fracturing the denotative signified "girl" into multiple contextual connotations: "Her books are open texts that, by eschewing dogmatism, deconstructing binaries of all kinds, and encouraging a plurality of readings, serve women well" (Campbell, 25). By eroticizing knowledge through the amorous replication of erudite words and worlds, Byatt effectively resignifies the intellectual woman as desirable. In "The Pink Ribbon", Byatt uses a case of Alzheimer to dramatize the mind/body conflict of Madeleine whose need for "intelligent occupation" (*Little Black Book of Stories*, 211) led her to work in Intelligence and for whom the mind was substitutable for the body "as though the word [intelligent] was interchangeable with 'sexy'" (*Little Black Book of Stories*, 211). The terror of entrapment within an unresponsive body parallels Byatt's concurrent fear of confinement to narrow ideology:

In the 1970s I felt trapped by Freud's idea of "normality," and the sociologists' confident diagnosis of my own unconscious ideological positions. Later I felt trapped by constructions of "gender," largely because I

had not the intellectual weaponry, or indeed the desire, to construct an opposing set of definitions, only a sense that the systematisers' descriptions of me were misleading, or inadequate, or couched in loose, or meaningless, or tautological language. ("Faith in science")

She has developed faith in science as a way out of essentialism both in relation to the body and to the mind. Her fluid approach to critical theory realized through interdisciplinary analogy thus mirrors the protean metamorphoses of female bodies in her work: "so prevalent are the connections between Byatt's novels and her theoretical writing that the intertextual references and metaphorical structures she discusses in an essay very soon appear in her next piece of fiction, or vice versa" (Polvinen). Etymological accuracy combined with erudite analogy allows her to create new female mythologies. She achieves such resignification by "reconcil[ing] realism and myth, in parallel with the realisation that science and literature are two ways of looking at the same natural order, as encapsulated in their common use of metaphor and analogy" (Brown, 65). A. S. Byatt constructs the woman writer as "embodied mind" or resignified *vagina*, thus diverting the fateful destiny of both Arachne and Marsyas as doomed contestants by affirming "the right of a woman to be a great writer and to put her work first" (Tredell, 60). Writing has allowed Byatt to escape the constraints of gendered identity in the 1950s. Science has further provided her with a way to problematize the body/mind dilemma by eroticizing erudition. The anatomy of her style, which she consistently delivers through her fiction and non-fiction, is evidence that learning and thinking about the world in the variety of its dimensions is the source of her inspiration, and science has captured her creative imagination.

## Notes

1. The Quartet novels is the expression used by Alexa Alfer and Amy J. Edwards de Campos to designate the four novels Byatt dedicated to the Potter family: *The Virgin in the Garden*, *Still Life*, *Babel Tower* and *A Whistling Woman*.

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