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Against finality: Darwin, Mill and the end of essentialism

Pink

A few years ago it was widely reported that girls really do prefer pink. Scientists have apparently proved it. The stories drew on a study published in *Current Biology*¹ in which two neuroscientists ‘report a robust, cross-cultural sex difference in color preference’ and suggest links to the evolution of sex-specific behaviour.² The *Telegraph* remarked, ‘the reason could have its origins in the hunt for food on the African savannah millennia ago’³ and the *Independent*, under the weighty subtitle ‘It’s in our genes’ (this claim is a media favourite), observed that the study was ‘the first to show that there is a scientific basis for the idea that girls are born with a particular affinity for pink colours’.⁴ The story has continued to be newsworthy; earlier this year, beneath a triumphant headline, ‘Modern girls are born to plump for pink’, the *Mail* stated that, according to scientists, females are drawn to pinks and reds because their brains became ‘fine-tuned’ to the colours of ripe fruits and berries.⁵ Hence they opt for pink toys at an early age. Men, meanwhile, have ‘developed a preference for the clear blue skies that signalled good weather for hunting’.⁶

Women’s brains, the *Mail* asserted, are more specialised for gathering-related tasks. It extends this to sexual preference – men with rosy cheeks are seemingly more desirable (because they are healthy), noting that at Newcastle University researchers claim to be able to deduce sex from the anonymised results of their colour tests. The reports seek to lend credence to the story through their references to ‘experts’ and ‘researchers’. The BBC quoted the lead investigator Anya Hurlbert: ‘Evolution may have driven females to prefer reddish colours – reddish fruits, healthy, reddish faces’.⁷ The Eurocentric assumption here is worth noting: the remark overlooks the fact that humans evolved in Africa and are thought to have had dark skins, losing pigmentation at a later stage in adapting to northern climates.⁸ And how is evolution being used here? It is a word with ready media appeal, offering a story that combines the comfort (from where we are now) of a just-so story with the authority of science. If evolution is development over time, then how do we account for a preference for reddish colours in a society in which to gather fruit is no longer one of the main

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¹ Anya C. Hurlbert and Yazhu Ling, ‘Biological Components of Sex Differences in Color Preference’, *Current Biology*, 17 (21 August 2007), R623–25.

² Ibid., R626

³ <http://www.telegraph.co.uk/science/science-news/3304225/Girls-really-do-prefer-pink-study-shows.html> (accessed 5 May 2011).

⁴ <http://www.independent.co.uk/news/science/boys-like-blue-girls-like-pink-its-in-our-genes-462390.html>.

⁵ <http://www.dailymail.co.uk/sciencetech/article-1380893/Modern-girls-born-plump-pink-thanks-berry-gathering-female-ancestors.html?ITO=1490> (accessed 5 May 2011).

⁶ <http://www.sott.net/articles/show/227877-Modern-girls-are-born-to-plump-for-pink-thanks-to-berry-gathering-female-ancestors->.

⁷ <http://news.bbc.co.uk/1/hi/health/6956467.stm> (accessed 27 June 2011). For a recent, more considered, evaluation of colour and toy preferences in boys and girls, see <http://www.bbc.co.uk/programmes/b010y39d> (accessed 28 June 2011).

⁸ I am grateful to Anne Fausto-Sterling for this insight.

responsibilities of women and girls. On the other hand, a commodity culture which bombards girls with pink objects is likely to produce girls who like pink. Evolutionary biology challenges concepts of the innate, concerned, as it is, with change over time. Observable characteristics of living organisms are necessarily viewed in a time frame that is narrow when compared to evolutionary time. And an ability or preference measured for a set of men and women will give a distribution of results dependent on genotype, environment and experience. The distributions will inevitably overlap: sex cannot be reliably deduced from an individual's preference or ability in a particular area. And yet essentialism persists as a way of seeing and ordering: boys *will* be boys.⁹

Nearly a century and a half ago the biologist and novelist Grant Allen, in his influential *Physiological Aesthetics* (1877), dedicated to the biologically minded philosopher Herbert Spencer, had argued for the influence of bright-coloured fruits, berries, and flowers on the growth of aesthetic feelings.¹⁰ He claimed, 'the very existence of reds, yellows, and purples in the outer world is indirectly almost entirely owing to their special effect upon animal organs'.¹¹ Allen was an essentialist thinker on matters both of sex and race; committed to a deterministic view, he stressed that 'men and women differ infinitely in emotions and intellect'.¹² His views were widely disseminated. In his 'Plain Words on the Woman Question', which appeared in both the *Fortnightly Review* and *Popular Science Monthly* in 1889, he insisted that women be educated 'for the functions which Nature intended them to perform'; this was resonant with the dominant view that gender was an expression of nature, not culture.¹³

In this paper I will consider challenges to the idea pervasive in cultural studies and in popular culture that biology is deterministic. This has been upturned in philosophy, notably by John Dupré in *The Disorder of Things: Metaphysical Foundations of the Disunity of Science* (1993), which rejects the idea that the world is deterministic; this forms part of Dupré's argument against the idea that a thing has an essence that will determine to which laws of nature that thing is subject, as he observes the connections between reductionism, determinism and essentialism as the three pillars of conventional classification.¹⁴ He extends this to biological sex, questioning the assumption of homogeneity among the members of any kind.¹⁵ Nonetheless, deterministic assumptions about biology and sex remain. Emphasising the centrality of history to Darwin's biology, and considering correspondences between his ideas and those of the liberal philosopher John Stuart Mill, and their shared emphasis on the value of individual difference, I will explore ways in which Victorian evolutionary biology can be situated against essentialist biology and anticipates the new emphasis on dynamic process, plasticity and freedom in twenty-first-century biology. Turning to parallel developments in the Victorian novel, I examine the extent to

⁹On gendered essentialism in the twenty-first century, see Ann Heilmann in this issue.

¹⁰Grant Allen, *Physiological Aesthetics* (London: Henry S. King & Co., 1877), 98.

¹¹*Ibid.*, 155.

¹²*Ibid.*, 47.

¹³*Fortnightly Review*, 52 (1889), 448–58; *Popular Science Monthly*, 36 (1889), 175. On Allen's racial views, see 'The Reverend John Creedy', in Grant Allen, *Strange Stories* (London: Chatto & Windus, 1884).

¹⁴John Dupré, *The Disorder of Things: Metaphysical Foundations of the Disunity of Science* (London and Cambridge MA: Harvard University Press, 1993), 171; 6.

¹⁵*Ibid.*, part 1 and 252–4.

which the writer and pioneering women's rights campaigner Mona Caird (whom Grant Allen would decry in the press as lispig Greek)¹⁶ drew both on Darwin's non-essentialist biology and on Mill's individualism as a way of conceiving change, calling into question the idea that biology was necessarily limiting to women.

Sophisticated analyses of gendered behaviour, which take into account the complex and changing relation between nature and nurture, are emerging in contemporary biology. The developmental biologist Anne Fausto-Sterling, in a recent talk on sexual difference, delivered against a background of a dramatic pink and blue toy dimorphism, suggests using a dynamic systems approach to think about sex and gender, and, specifically, how development produces a phenotype – the set of observable characteristics of an individual.¹⁷ According to the developmental psychologist Paul van Geert, a dynamic system is 'a set of variables that mutually affect each other's changes over time'.¹⁸ The variables interact and this interaction itself changes over time. This approach works with a complex world 'where real infants live and develop in a world filled with people, things and events in continuous interaction'.¹⁹ Fausto-Sterling asks what happens developmentally to a nervous system and visual system developed in an environment of intensive exposure to either pink or blue toys, according to sex. Considering preference as a developing pleasure centre that responds to familiarity, to exposure and to positive emotional feedback, she suggests this is a new and different way of framing the question. In this sense, then, she argues, preference is a biological phenomenon because it develops in the brain, but it is stimulated by exposure and by positive emotional affect from care givers. She argues that in a dynamic systems model nurture is not outside of nature. According to this model, nature and nurture are so closely related they do not so much interact, which suggests they are independent entities, as are entwined and help constitute each other.²⁰ While the researchers claiming a biological component to colour preference made their argument in *Current Biology* a deterministic one, produced by an imagined past, it is possible to understand preference in biological terms without recourse to essentialism. New concepts of plasticity and malleability in biology undercut essentialist thinking about sex and identity.²¹

¹⁶Grant Allen, 'The Girl of the Future', *Universal Review*, 7 (1890), 52.

¹⁷Anne Fausto-Sterling, 'Towards a Modern Framework for the Debate About Difference', at 'The Differences Between the Sexes – From Biology to Behaviour', European Molecular Biology Laboratory/European Molecular Biology Organization Conference, Heidelberg, 6 November 2010; http://www.embl.de/training/events/2010/SNS10-01/online/seminars_day2/index.html (accessed 3 February 2011). The images are from Jeong Mee Yoon's pink and blue project <http://www.colourlovers.com/blog/2008/02/08/the-pink-and-blue-project-by-jeongmee-yoon/>. See also Evelyn Fox Keller, *The Mirage of a Space between Nature and Nurture* (Durham NC: Duke University Press, 2010).

¹⁸Paul van Geert, *Dynamic Systems of Development: Change Between Complexity and Chaos* (New York and London: Harvester Wheatsheaf, 1994), 50. See also Denis Noble, *The Music of Life: Biology Beyond the Genome* (Oxford: Oxford University Press, 2006).

¹⁹Esther Thelen and Linda B. Smith, *A Dynamic Systems Approach to the Development of Cognition and Action* (Cambridge MA: MIT, 1996), xiii.

²⁰<http://www.psychologytoday.com/blog/sexing-the-body/201007/nature-versus-nurture-part-1-it-s-time-withdraw-war>; published 29 July 2010 (Accessed 5 May 2011).

²¹On phenotypic plasticity, see T. D. Price, A. Qvarnström and D. E. Irwin, 'The Role of Phenotype Plasticity in Driving Genetic Evolution', *Proceedings of the Royal Society B: Biological Sciences*, 270 (2003), 1433–40; G. de Jong, 'Evolution of Phenotypic Plasticity: Patterns of Plasticity and the Emergence of Ecotypes', *New Phytologist*, 166:1 (2005), 101–17, and Christopher Shaw and Jill McEachern (eds), *Towards a Theory of Neuroplasticity* (London: Psychology Press, 2001). See also Nikolas Rose, *The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century* (Princeton: Princeton University Press, 2006), and François Ansermet and Pierre Magistretti, *Biology of Freedom: Neural Plasticity, Experience, and the Unconscious* (London: Karnac Books, 2007).

Aside from the conflation of reddish-brown with pink necessary to make a splash in the papers, there is a hole in the story about gendered colour preferences and evolution. We do not inhabit a hunter-gatherer society. Something that happened thousands of years ago is not necessarily a means of explaining present characters or behaviour. When Charles Lyell published his voluminous *Principles of Geology* (1830–33) he subtitled it ‘An attempt to explain the former changes of the Earth’s surface by reference to causes now in operation’, but this stable geological relation between present and past, predicated on the relatively steady state of the earth, does not obtain in the dynamic world of evolutionary biology. In the often quoted words of the population geneticist Theodosius Dobzhansky in his 1973 essay in the *American Biology Teacher*, ‘Nothing in biology makes sense except in the light of evolution’; evolution has revolutionised knowledge.²² The biologist Steven Rose extends this claim: ‘nothing in biology makes sense except in the light of history’, and counters the assertion by evolutionary psychologists that evolutionary selection pressures have not produced significant change.²³ Evolution is development over time. Species, individuals and cultures have histories. (Darwin himself does not stand outside of history, which both enriches and delimits his research.) In *Human Nature and the Limits of Science* (2001) Dupré offers an extended challenge to evolutionary psychology, emphasising the remarkable nature of the interaction between the human brain and environment. Interrogating attempts to find universals across cultures, he insists on a pluralistic understanding of human nature.²⁴ Context and environment matter in evolution, and are now coming to be seen as inseparable from the organism. Arguments which seek to explain present behaviours through their relation to largely unknown and therefore imagined original human societies are deeply flawed.

Mutability

In *On the Origin of Species, by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life* (1859) Darwin set in train an epistemological revolution which must inform any assessment of the impact of his ideas on questions of sex, or wider considerations of the politics of biology. Species are a contingent effect of process. John Dewey, the leading American pragmatist and educational reformer, set out the implications of Darwin’s idea with acuity in his 1909 contribution to a series of public lectures on Darwin and his influence on science, subsequently published in *Popular Science Monthly*.²⁵ Underpinning Dewey’s philosophy is an acceptance – and a celebration – of mutability, which has particular resonance with Darwin’s theory. He stressed that the combination of ‘origin’ and ‘species’ was itself an intellectual revolt which is ‘easily overlooked by an expert’;²⁶ for two thousand years the fixed and final had been central to ideas of nature and knowledge. Both change and origin had been signs of ‘defect and unreality’.²⁷ A species isn’t supposed to originate, it just *is*. The *Origin*, which undid the

²²Theodosius Dobzhansky, ‘Nothing in Biology Makes Sense Except in the Light of Evolution’, *American Biology Teacher* (1973), 35, 125–9.

²³Steven Rose, ‘Escaping Evolutionary Psychology’, in Hilary Rose and Steven Rose, *Alas Poor Darwin: Arguments Against Evolutionary Psychology* (London: Vintage 2001), 253.

²⁴*Human Nature and the Limits of Science* (Oxford, Oxford University Press, 2001).

²⁵John Dewey, ‘The Influence of Darwinism on Philosophy’, *Popular Science Monthly*, 75 (1909), 90–98, repr. in Dewey, *The Influence of Darwin on Philosophy and other Essays* (New York: Prometheus Books, 1997), 1–19.

²⁶*Ibid.*, 1.

concept of permanency, ‘transformed the treatment of morals, politics and religion’.²⁸ It precipitated a crisis. This was not one of a clash between science and theology – though this myth is perpetuated. Dewey points out that the real opposition to Darwin was to be sought not in religion but in science and philosophy: the concept of species which had controlled philosophy for two thousand years, subordinating aimless flux to a perfect manifestation, was over.²⁹ Species was conceived as ‘leaping the boundaries of time and space’; individuals ‘distant in space and remote in time’ were kept to a uniform structure and function.³⁰ The disorder, the flux of the natural world which has always been observable was discounted in favour of underlying permanency. But after Darwin, nature was to be read without reference to permanency, to ‘real essences, hidden forms’.³¹ With the espousal of empiricism, observations and sense-perceptions were suddenly more important. Nature was to be read closely, on its own, immediate, terms. When Darwin said that species changed, Dewey states, ‘he emancipated, once for all, genetic and experimental ideas as an organon of asking questions and looking for explanations’.³² The very logic of science, which had rested on fixity, was upturned. Now change as the condition of life had to be accommodated. And the new logic introduces, Dewey argues, responsibility into the intellectual life.³³ Previously, straining at permanent, invisible, forms, meant avoiding engaging with immediate life.

Species, then, were an artificial convenience. Darwin remarked in the *Origin*, ‘the only distinction between species and well-marked varieties is, that the latter are known, or believed, to be connected at the present day by intermediate gradations, whereas species were formerly thus connected’, and concluded:

we shall have to treat species in the same manner as those naturalists treat genera, who admit that genera are merely artificial combinations made for convenience. This may not be a cheering prospect; but we shall at least be freed from the vain search for the undiscovered and undiscoverable essence of the term species.³⁴

Early in the twentieth century, as biometricians developed statistical tools for characterising the variability that provided the material for selection, they opposed the Mendelian emphasis on discontinuous all-or-nothing acquisition of characteristics.³⁵ Led by Darwin’s cousin Francis Galton, the mathematician Karl Pearson and the biologist W. F. R. Weldon, biometricians challenged Mendelian particulate essentialist genetics as simplistic; it was inconsistent with Darwin, and, following him, they believed that evolution proceeded through the selection of continuous differences.³⁶ As the historian of science Peter Bowler notes, biometricians were right to see the selection of continuous variations as the

²⁷Ibid.

²⁸Ibid., 2; and see Thomas Dixon, ‘America’s Difficulty with Darwin’, *History Today*, 2009, reproduced at <http://www.darwinproject.ac.uk/darwin-and-religion-in-america>; see also John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991).

²⁹On ways in which Aristotle’s concept of species was in fact less prescriptive than is often thought, see Christopher Gill in this issue. While there is a lack of consensus on the degree to which essentialism controlled concepts of species before Darwin, as noted by Staffan Müller-Wille in this issue, it became untenable after Darwin.

³⁰Dewey, ‘The Influence of Darwinism on Philosophy’, 5.

³¹Ibid., 7.

³²Ibid., 9.

³³Ibid., 17.

³⁴Charles Darwin, *On the Origin of Species by Means of Natural Selection*, 1st edn (London: John Murray, 1859), 485.

³⁵See Peter Bowler, *Evolution: The History of an Idea* (Berkeley and Los Angeles: University of California Press, 1989), 256.

mechanism of evolution. They came to recognise, again following Darwin, that heredity and variation were not mutually antagonistic.³⁷ Later, population geneticists came to understand the complexity of the genetic structure of a population, which led to a resurgence of Darwinism.³⁸ When R. A. Fisher argued for Mendelian inheritance and the continuity of germ plasm, Sewall Wright distinguished his own work from Fisher and J. B. S. Haldane's emphasis on the deterministic effects of the mass selection of single genes, arguing instead for the selection of interaction systems of genes.³⁹ Genes themselves, not merely the gene set in an organism, evolve, undermining the possibility of genetic essentialism.

This shift from the permanent to the changing still needs to be more widely acknowledged if we are to think fully through the possibilities of biology. To think biologically is not to think biologically. Biology can be non-essentialist, indeed evolutionary biology must, by definition, reject inevitability and the concept of differences that remain constant over time.

History

Darwin refers constantly to history in the *Origin of Species* and *The Descent of Man, and Selection in Relation to Sex* (1871). His work was a development of natural history, but the emphasis of natural history lay on nature rather than history, on taxonomic diversity rather than development.⁴⁰ In the words of the evolutionary biologist and historian of science Ernst Mayr, 'the natural history of animals was studied mainly as part of natural theology, in order to bolster the argument from design'.⁴¹ Mayr notes, though, the contribution of natural history to biology.⁴² Darwin shared with naturalists a joy in observation, but sought to relate the objects of study to new, dynamic processes which would necessitate a deeper understanding of history. In the *Origin*, he emphasises that he is concerned with 'the changing history of the organic world'⁴³ and with 'slow and gradual process'.⁴⁴ It is history that allows Darwin to reject progress as the normal rule.⁴⁵ Only history would allow him to work out the relations which upturned immutability: 'The terms used by naturalists of affinity, relationship, community of type, paternity, morphology, adaptive characters, rudimentary and aborted organs, &c., will cease to be metaphorical, and will have a plain signification.'⁴⁶ The *Origin* is about history more than origin, and Darwin proposed that in his next book, 'Light will be thrown on the origin of man and his history'.⁴⁷ Referring in the *Origin* to Lyell's metaphor of the geological record as a book with only a few pages

³⁶See Donald MacKenzie, *Statistics in Britain 1865–1930: The Social Construction of Scientific Knowledge* (Edinburgh: Edinburgh University Press, 1981), 123, 130.

³⁷Bowler, *Evolution*, 256.

³⁸*Ibid.*, 308.

³⁹William B. Provine, *The Origins of Theoretical Population Genetics* (Chicago: University of Chicago Press, 1971). See Sewall Wright, 'Evolution in Mendelian Populations', *Genetics*, 16 (1931), 97–159.

⁴⁰See Jim Endersby, *A Guinea Pig's History of Biology* (London: Heinemann, 2007), 145, on the emphasis in natural history on collecting and naming; Endersby also sees the move to the laboratory and experimentation towards the end of the nineteenth century as a major difference between natural history and the new biological sciences.

⁴¹Ernst Mayr, *The Growth of Biological Thought* (Cambridge MA: Harvard University Press, 1982), 36.

⁴²*Ibid.*, 143; Mayr refers here to D. E. Allen's *The Naturalist in Britain: A Social History* (London: Allen Lane, 1975) and to Darwin's debt to natural history research.

⁴³Darwin, *Origin*, 106.

⁴⁴*Ibid.*, 40.

⁴⁵*The Descent of Man, and Selection in Relation to Sex*, 1st edn (London: John Murray, 1871), vol. 1, 166.

⁴⁶Darwin, *Origin*, 485.

⁴⁷*Ibid.*, 489.

preserved, Darwin extends this. Giving close attention to historical change, he imagines a history imperfectly kept, changing dialect, and only a few lines on each page.⁴⁸ The image brings home the vastness of time unrecorded – written history is only a tiny slice of human history – but also the effort that must be made to understand the past, to decipher. Through the metaphor, Darwin brings together history and biology – ‘each word of the slowly-changing language, in which the history is supposed to be written, being more or less different in the interrupted succession of chapters, may represent the apparently abruptly changed forms of life’.⁴⁹ He positions himself as a historian.

History is necessarily concerned with change, and with the social or the environmental. If environment, with which Darwin was so concerned, is understood to include the social, then to what extent might we see Darwin as a social constructionist? While this might seem a curious idea, and somewhat counter-intuitive – Darwin is, after all, a biologist – if we take as social construction the idea that what is is not inevitably the case, it would seem plausible. Ian Hacking, in his *The Social Construction of What?*, distinguishes degrees of social construction.⁵⁰ By focusing on *construction* rather than *social* in the idea of social construction, he argues that social construction is a way of arguing against the inevitability of something: ‘social constructionists about $\times$ tend to hold that: (1) $\times$ need not have existed, or need not be at all as it is. $\times$, or $\times$ as it is at present, is not determined by the nature of things; it is not inevitable.’⁵¹ He defines essentialism, by contrast, as a way of talking about inevitability – the strongest version of inevitability. For Hacking, the least demanding grade of constructionism is historical: ‘a historical constructionist could be quite noncommittal about whether $\times$ is good or bad’.⁵² There is little about Darwin’s story that is inevitable.

Darwin, Mill and the individual

One expression of Darwin’s anti-essentialism is his focus on individuals. He knows, applying a Malthusian framework, that the individual is discarded by the processes of natural selection, ‘As many more individuals of each species are born than can possibly survive’.⁵³ Tennyson’s formulation of nature – ‘So careful of the type she seems,/ So careless of the single life’⁵⁴ – expressed this anxiety. Individuals could – and did – go to the wall. But it was not the whole story. While the individual would in one sense be dislodged by the grand, seemingly impersonal narrative of evolution, they would in another be reinserted – for it was through individual difference and, in the case of sexual selection, individual choice, that evolution was possible. Individuals were now given a new significance as visible expressions of dynamic process. The place of the individual in an evolving world gained a new attention in fiction. George Eliot, immersing herself thoroughly in natural history and biology, captured the dilemma of the individual, supported but also hemmed in by wider society.⁵⁵ In 1856, in ‘The Natural History of German Life’,

⁴⁸Ibid., 310–11.

⁴⁹Ibid., 311.

⁵⁰Ian Hacking, *The Social Construction of What?* (Cambridge MA: Harvard University Press, 1999), 7.

⁵¹Ibid., 6.

⁵²Ibid., 19.

⁵³Darwin, *Origin*, 5.

⁵⁴Tennyson, *In Memoriam* (1850), section 55, stanza 2.

⁵⁵On Eliot’s reading, see William Baker, *The George Eliot–George Henry Lewes Library: An Annotated Catalogue of their Books at Dr William’s Library*, London (New York and London: Garland Publishing, 1977).

her review of the first two parts of W. H. Riehl's *Naturgeschichte des Volkes* in the *Westminster Review*, she remarked 'no biological generalization will enable us to predict the infinite specialities produced by the complexity of vital conditions'.⁵⁶ Those of Eliot's characters who reach maturity come to see their own individual difference and that of others: their equivalent centres of self.⁵⁷ Her last novel, *Daniel Deronda* (1876), is the story of the vision of a single subject.

As social mobility increased, cities developed and autobiographies deepened, the individual came increasingly to the fore. The novel turned inward, fragmenting even into short stories by the end of the century. Writing at this time, Mona Caird, a devoted advocate of Mill's individualism, explored and put into practice in her fiction his emphasis on individual liberty, on eccentricity, equality between the sexes, talent and talent thwarted. She also wrote on these questions in the press over a period of several years. Considering the implications of evolution for relations between the sexes, and offering the possibility of social transformation, Caird's controversial article 'Marriage' in the *Westminster Review* sparked the most famous newspaper debate of the century – 'Is Marriage a Failure?' – conducted through letters from around the world in the pages of the *Telegraph* during the summer of 1888. The debate even made its way into *The Diary of A Nobody* in *Punch* later in the year, with Mr Pooter recording: 'we had a most pleasant chat about the letters on "Is Marriage a Failure?" It has been no failure in our case'.⁵⁸ As I shall show, Caird drew closely on the ideas of Darwin, integrating his views with those of Mill as she explored the development of the individuals, and the influences and pressures to which they were subject.

Individual peculiarities mattered in their own right, no longer to be referred to an invisible, universal form, as Darwin changed the focus from types to dynamic processes. The slightest change in an individual was now worthy of note. 'The variability of the faculties in the individuals of the same species is an important point for us',⁵⁹ Darwin stated, giving 'individual experience' a new role in seeking to explain the value of characteristics.⁶⁰ Of dogs he observed, 'that animals retain their mental individuality is unquestionable',⁶¹ and, pondering their mating preferences, he offered the view of the Scottish breeder George Cupples: 'dogs are often influenced by "individual character"'.⁶² Every slight difference, every peculiarity, was an effect needing an efficient cause.

In the *Descent* individuals are made visible by variability. 'It is manifest that man is now subject to much variability', Darwin declared. 'No two individuals of the same race are quite

⁵⁶George Eliot, 'The Natural History of German Life', *Westminster Review* (1856), 51–79, repr. in *Selected Essays, Poems and Other Writings*, ed. A. S. Byatt and Nicholas Warren (London: Penguin, 1990), 107–39 (p. 130). In this passage Eliot draws on and diverges from Comte, seeing the phenomena of biology as outlying the boundaries of science; see A. Richardson, 'Darwin and Reductionisms: Victorian, Neo-Darwinian and Postgenomic Biologies', in *19: Interdisciplinary Studies in the Nineteenth Century*, vol. 11(2010), and Sally Shuttleworth, *George Eliot and Nineteenth-Century Science: The Make-Believe of a Beginning* (Cambridge: Cambridge University Press, 1984), 26.

⁵⁷George Eliot, *Middlemarch*, ed. David Carroll (Oxford: Oxford University Press, 2008), 198.

⁵⁸George and Weedon Grossmith, 'The Diary of a Nobody', *Punch* (17 November 1888), 233.

⁵⁹Darwin, *Descent*, vol. 1, 36.

⁶⁰*Ibid.*, vol. 1, 50.

⁶¹*Ibid.*, vol. 1, 63.

⁶²*Ibid.*, vol. 2, 272. Cupples bred and reared a deerhound puppy, Bran, for Darwin in 1870. Darwin reported it getting on well with his terrier, Polly, who appeared in his *Expression of the Emotions in Man and Animals* the following year. Darwin to George Cupples, November 1870, 278; <http://www.darwinproject.ac.uk/entry7383> (accessed 25 July 2011).

alike. We may compare millions of faces, and each will be distinct.⁶³ His work, centred here on humans, opens up a new space for negotiating the value of the individual, and relations between individuals, just as the novel was headed in the same direction. Without individuals there could be no grand narratives; even as the individual seemed to falter under the weight of the story of evolution, it was vital to its processes. And as Darwin brought sexual selection into the evolutionary scheme in the *Descent*, individual choice assumed a new importance: 'As man can modify his domesticated birds by selecting the individuals which appear to him the most beautiful, so the habitual or even occasional preference by the female of the more attractive males would almost certainly lead to their modification.'⁶⁴ Looking back at the *Origin* he remarked:

I had also fully appreciated the importance of mere individual differences, and this led me to insist so strongly on the importance of that unconscious form of selection by man, which follows from the preservation of the most valued individuals of each breed, without any intention on his part to modify the characters of the breed.⁶⁵

Natural selection is a story about individuals changing over time. Though it makes grand and general claims it is about the minute, the particular.

Darwin and Mill are not generally viewed in the same light; Mill was a liberal thinker who didn't have a good word to say about instincts, and Darwin was a biologist.⁶⁶ They differed on contraception (Mill was an advocate; Darwin was not), and Darwin once asked his eldest son William to read up on Mill and tell him what he should think.⁶⁷ He did, though, read his *Utilitarianism*, and was largely in favour, though they differed on morality (with Mill seeing it as acquired, and Darwin as innate);⁶⁸ Darwin also put the common good before happiness. Mill would endorse the logic of Darwin's reasoning in the *Origin* (which gave Darwin great satisfaction).⁶⁹ Mill's treatment of individuality has significant and overlooked correspondences with Darwin's emphasis on the need for variation. Both emphasised the historical dimension of development and saw that without diversity there could be no possibility for change. For Darwin the potential for development was located in the biology of the individuals of a species, for Mill in individual minds. The focus for both was on change and heterogeneity. The imperfection of humans, their non-essential, mutable state, was crucial to development. In *On Liberty* (1859) Mill wrote:

As it is useful that while mankind are imperfect there should be different opinions, so is it that there should be different experiments of living; that free scope should be given to varieties of character, short of injury to others; and that the worth of different modes of life should be proved practically, when any one thinks fit to try them. It is desirable, in short, that in things which do not primarily concern others,

⁶³Darwin, *Descent*, vol. 1, 108.

⁶⁴*Ibid.*, vol. 2, 124.

⁶⁵*Ibid.*, vol. 2, 125 n. 32. He acknowledged, though, by the fifth edition of the *Origin* (London: John Murray, 1869), that many individuals would need to be modified for the variations to be perpetuated (p. 104). Here, he refers to an article in the *North British Review* (June 1867), 286.

⁶⁶See John Stuart Mill, *Nature, The Utility of Religion and Theism* (London: H. Holt, 1874); on Mill and instincts, see A. Richardson, 'Hardy and the Place of Culture', in Keith Wilson (ed.), *A Companion to Thomas Hardy* (Oxford: Blackwell, 2009), 60–62.

⁶⁷Janet Browne, *The Power of Place* (Princeton: Princeton University Press, 2002), 332.

⁶⁸Darwin, *Descent*, vol. 1, 71 n. 5.

⁶⁹Darwin to Henry Fawcett, 20 July 1861; <http://www.darwinproject.ac.uk/entry3215a> (accessed 25 July 2011).

individuality should assert itself. Where, not the person's own character, but the traditions of customs of other people are the rule of conduct, there is wanting one of the principal ingredients of human happiness, and quite the chief ingredient of individual and social progress.⁷⁰

Quoting from Wilhelm von Humboldt's defence of individual freedom, *The Spheres and Duties of Government*, which had been translated into English in 1854, Mill stressed the importance of 'freedom, and a variety of situations' which would lead to 'individual vigour and manifold diversity', combining themselves in 'originality'.⁷¹ Drawing on a language of nature, his argument would find parallel in the *Origin* later that year. Different persons, he declared, required different conditions: 'they can no more exist healthily in the same moral, than all the variety of plants can in the same physical, atmosphere and climate'.⁷² The analogy with nature is a telling one; there was common ground in their projects. Mill's concept of 'new and original experiments in living'⁷³ is what Darwin's organisms are putting into practice. Darwin observed 'that organic beings must be exposed during several generations to the new conditions of life to cause any appreciable amount of variation; and that when the organisation has once begun to vary, it generally continues to vary for many generations'.⁷⁴ Likewise, he wrote:

of the plants and animals which have been cultivated, and which have varied during all ages under the most different climates and treatment, I think we are driven to conclude that this greater variability is simply due to our domestic productions having been raised under conditions of life not so uniform as, and somewhat different from, those to which the parent-species have been exposed under nature.
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Immediately following the *Descent*, the Oxford Professor of Anatomy and Physiology, George Rolleston, wrote to Darwin applauding his dissent from Mill's views of the mental differences of men and women.⁷⁶ But, as I shall show, late nineteenth-century feminists were able to see that their shared emphasis on variation was of far greater significance than Darwin's remarks on sexual differences.

Mona Caird explored the implications of Darwin's anti-essentialism, and integrated them with the ideas of Mill, as I have noted. In 1894 she published an article in the *Westminster Review* with the Darwinian title 'The Suppression of Variant Types'. The piece offers insight not only into Darwin's own theory but also into ways in which biology could be non-essential, and she also suggests ways in which writers of fiction could contribute to the new biology and open up new possibilities for developing character. In her novels she repeatedly questioned the concept of biological essentialism, arguing for the overriding influence of environment or daily circumstance. In her controversial bestseller *The Daughters of Danaus*,

⁷⁰Mill, *On Liberty* (London: Penguin, 1985), 120.

⁷¹Wilhelm von Humboldt, *The Sphere and Duties of Government* (London: John Chapman, 1854), 11–13; cited in Mill, *On Liberty*, 121.

⁷²Mill, *On Liberty*, 133.

⁷³Ibid., 147.

⁷⁴Darwin, *Origin*, 7.

⁷⁵Ibid.

⁷⁶George Rolleston to Darwin, 22 February 1871, <http://www.darwinproject.ac.uk/entry7506> (accessed 25 July 2011). I have not found a reply from Darwin on this.

which also appeared in 1894, four children housed under the same roof but with different experiences and immediate circumstances show remarkably distinct characters. The novel counters the concept of intention in nature, and resists the idea that heredity could be predicted. Valeria du Prel ponders of one of the children, Hadria: 'where *did* you come from?' The narrator observes: 'There appeared to be more here than mere heredity could account for. But science had never solved this problem; originality seemed always to enter upon its career, uncaused and unaccountable'.⁷⁷ Taking up Darwin's emphasis on modification, Caird argued in the *Westminster Review* that 'the fatal and common mistake is to take humanity as we happen to find it in our age and country';⁷⁸ 'we must on no account admit that local "human nature" as a constant factor, but must regard it as a mere register of the forces that chance to be at work at the moment, and of the forces that have been at work in the past'.⁷⁹ This emphasis on chance, and on the combination of (varying) present and past pressures, is Darwin's own. Different types – another Darwinian term – are produced by different times, 'though born of the same race'. Like Darwin, she emphasised variation within racial groups. Darwin had remarked, 'many of our domestic races have descended from the same parent'.⁸⁰ For Caird an ability to record change, to remember, gave humans additional possibilities of directing their own development. She argued that society was failing to give biology its full expression, and worked with a non-essentialist idea of biology radically distinct from that which informed contemporary notions of female inferiority and subordination as inevitable. The evolutionary perspective she adopts enables her to challenge contemporary scientists such as the prominent psychiatrist Henry Maudsley. Environmental influence – the motor of social and biological development – must be allowed, in her argument, to exert an unsuppressed influence. 'If it be acknowledged, in theory, ' she wrote, 'that man is the product of his surroundings, it is ignored in practice.' She refuted a fixed 'human nature', arguing that 'it is the chemical union of native bias with daily circumstance which has for product a human character'.⁸¹ In her final novel, *The Great Wave*, Dr de Mollyns declares, 'people talk a lot of nonsense about heredity, I maintain it's environment that eventually makes heredity'.⁸² In this way, she opens biology up to the social, bringing nature and nurture together in ways which anticipate twenty-first-century developments in biology.

Caird warned against the assumption that qualities and instincts currently visible were any more than historically contingent – this was not to deny traits that could be seen as biological, but to deny that they were inevitable and permanent – and reiterated her view that 'character is the product of native impulse in combination with daily circumstance'.⁸³ The term 'native impulse' indicates a forward-looking biology not of determinism but volition: impulse is both a bodily sensation and an expression of will. There is nothing in her

⁷⁷Mona Caird, *The Daughters of Danaus* (London: Bliss, Sands & Foster, 1894), 58.

⁷⁸Caird, 'Suppression of Variant Types', in 'Phases of Human Development', *Westminster Review* (January 1894), 141, 162–79, repr. in Mona Caird, *The Morality of Marriage, and Other Essays on the Status and Destiny of Woman* (London: George Redway, 1897), and in Ann Heilmann, (ed.), *The Late Victorian Marriage Question: A Collection of Key New Woman Texts*, 5 vols (London: Routledge (with Thoemmes Press, 1998), vol. 1, 197.

⁷⁹*Ibid.*, 197–8.

⁸⁰Darwin, *Origin*, 29.

⁸¹Caird, 'Suppression of Variant Types', 202, 203.

⁸²Caird, *The Great Wave* (London: Wishart, 1931), 43.

⁸³Caird, 'Suppression of Variant Types', 212–13.

discussion of human development to suggest anything passive, or determined by the past. In the same essay, she quotes the philosopher Eduard von Hartmann on the importance of independence of will: 'nothing can be reasonably designated moral except a will self-determining and legislating for itself'.⁸⁴ By 'native', she gestures towards but avoids the precise meaning of innate, signalling something that comes from within but which is not inevitable. It is a vital distinction, one on which freedom depends. Caird challenges the idea that the body is 'a rigid affair of mechanism, whose habits and needs were absolutely unmodifiable', observing 'this is far from being the case. The body can create for itself good habits and bad habits.'⁸⁵ Resisting the idea of 'the leading characteristics of the average man of to-day' as 'the final type of humanity', she refuses to accept humans as passive, determined by primitive impulses: 'We are beginning to understand, that we can only eradicate a habit or weaken an instinct, by altering the processes of the intellect, of the conscience, of the will, and, finally, of the physical constitution'.⁸⁶ Foreshadowing twenty-first-century non-essentialist configurations of biology, she argues that change itself can be biologically based. The physical constitution was capable of changing through pressures of mind. Impulse could be modified by 'human intelligence or moral development'.⁸⁷ Even women who wished to work with more conventional ideas in biology, which emphasised the role of women as nurturers, nonetheless required a biology that was able to accommodate change in order to give themselves a new regenerating role. These women included Sarah Grand, author of the bestselling *The Heavenly Twins* (1893). The change they sought, though, was predicated on the assumption that women were fundamentally different from men and possessed an elevated moral sense;⁸⁸ by contrast, Caird called into question ideas of inherent difference.

Sex

In *The Descent of Man*, Darwin extended his study to humans and had a lot more to say about sex. His discussion of human sexual differences and his claim that 'man has ultimately become superior to woman'⁸⁹ is probably the best-known aspect of this work, and has done little to help establish more generally the extent of his non-essentialism. For example, the historian and biologist Sue V. Rosser argues that Darwin's theory of sexual selection 'assures an ever-increasing separation between the sexes and their operation in two quite distinct realms that only touch for the purpose of procreation',⁹⁰ but is unclear that the separation is inevitably ever-increasing. Rosser does not consider ways in which sexual selection, in tandem with natural selection, seeks to account for change over time. Fiona Erskine argues that 'the sex stereotyping of the *Descent* is best understood in terms of an appreciation that evolutionary biology could be employed to counter the undue ambitions of women',⁹¹ and while she notes Darwin's support for women's education, she sees by the

⁸⁴Ibid., 208.

⁸⁵'The Tyranny of Instincts', *Westminster Review* (1894), repr. in Heilmann (ed.), *Late Victorian Marriage Question*, 221.

⁸⁶Ibid., 226.

⁸⁷Ibid., 231 n. 1.

⁸⁸For contemporary discussion of these ideas, see Elizabeth Rachel Chapman, *Marriage Questions in Modern Fiction, and Other Essays on Kindred Subjects* (London and New York: John Lane, 1897). See also A. Richardson, 'The New Fiction and the New Women', in P. Parrinder and A. Gasiorek (eds), *Oxford History of the Novel*, vol. 4, *The Reinvention of the British and Irish Novel 1880–1940* (Oxford: Oxford University Press, 2010), 133–46.

⁸⁹Darwin, *Descent*, vol. 2, 316–54.

⁹⁰Sue V. Rosser, *Biology & Feminism: A Dynamic Interaction* (New York: Twayne 1992), 58.

time of the *Descent* a commitment to ‘the hard fact of female inferiority’.⁹² She argues that the *Origin* implies female subordination because the focus is on sexual reproduction, and thus on women’s success in that role.⁹³ But evolutionary biology cannot help but concern itself with reproduction; to argue on account of this focus that Darwin had a reductive view of women is itself a reductive argument.

These more ideologically based readings are giving way now to more nuanced historical research. The Darwin Correspondence Project housed at Cambridge is currently working on a new Darwin and gender project, transcribing his letters to and from 148 women. It explores his support for women in science and his reliance on the editorial work of his daughter Henrietta on the *Descent*.⁹⁴ When Darwin addresses questions of sexual difference in his other work he is open-minded, and frequently surprised, showing no sense of sexual hierarchy. In orchids and barnacles he found surprising sex characteristics that may well have eluded someone more bound by conventional belief: ‘I had given up the whole case as inexplicable, when it occurred to me that, although no instance of the separation of the two sexes was known in Orchids, yet that Acropera might be a male plant’, he writes, a detective solving a mystery.⁹⁵ The orchid *Catasetum* turned out to have three forms – male, female, and hermaphrodite, each presenting extraordinary difference;⁹⁶ these had previously been thought to be different genera of flowers.⁹⁷ And in his barnacle research he found some males with multiple or extraordinarily long penises, and others that had previously been dismissed as parasites but were in fact complementary males, attached to wifely hosts and consisting of little more than a penis.⁹⁸

Darwin’s most notorious statements in the *Descent* are worth revisiting. Conceding that sexual differences in humans are not so great as, for instance, in the mandrill, he begins with physical differences: ‘Man on average is considerably taller, heavier, and stronger than woman, with squarer shoulders and more plainly-pronounced muscles [...] His body, and especially his face, is more hairy, and his voice has a different and more powerful tone’, and extends this to characteristics: ‘man is more courageous, pugnacious, and energetic’.⁹⁹ Drawing on material from keepers, breeders, and many of his other correspondents, he offered examples of such differences elsewhere in the animal kingdom. Male sticklebacks were particularly pugnacious (and polygamous), while their female companions were ‘quite pacific’; and male salmon and trout were equally so.¹⁰⁰ Likewise almost all male birds. And male South American lizards rarely meet without a fight in the spring.¹⁰¹

⁹¹Fiona Erskine ‘The Origin of Species and the Science of Female Inferiority’, in D. Amigoni and J. Wallace (eds), Charles Darwin’s the Origin of Species: New Interdisciplinary Essays (Manchester: Manchester University Press, 1995), 100.

⁹²Ibid.

⁹³Ibid., 101.

⁹⁴<http://blogs.sciencemag.org/origins/2009/07/darwin-women-and-science.html> <http://darwinandgender.wordpress.com/tag/henrietta-darwin/>.

⁹⁵On the various contrivances by which British and foreign orchids are fertilised by insects, 1st edn (London: John Murray, 1862), 206. I am grateful to Paul White for discussing these ideas with me.

⁹⁶Ibid., 211.

⁹⁷Ibid., 236.

⁹⁸Darwin, A monograph of the sub-class Cirripedia, with figures of all the species. The Lepadidae; or, pedunculated cirripedes, 1st edn (London: 1851), 56,232.

⁹⁹Darwin, *Descent*, vol. 2, 316.

¹⁰⁰Ibid., vol. 1, 2; 3.

¹⁰¹Ibid., vol. 1, 32.

Darwin frames his remarks on mental differences between men and women with an acknowledgement that some writers ‘doubt whether there is any inherent difference’. He believes that, through analogy with lower animals, this is ‘at least probable’ (among his comparator animals are wild boars/sows and apes). His language is tentative: woman ‘seems to differ in mental disposition’; ‘it is likely’ she should often extend her maternal instincts towards her fellow creatures.¹⁰² Unpalatable though many of his claims are here to modern readers, these differences are explained through time: they are not fixed characteristics. For example, ‘these various faculties’ have ‘been continually put to the test, and selected during manhood’.¹⁰³ What Darwin describes is a process of *becoming*, which he sees as capable of altering. Echoing Mary Wollstonecraft’s argument for the education of girls along the same lines as boys, in *A Vindication of the Rights of Woman* (1792), he goes on to suggest that with suitable opportunities and education women could become like men in their mental abilities: ‘in order that woman should reach the same standard as man, she ought, when nearly an adult, to be trained to energy and perseverance, and to have her reason and imagination exercised to the highest point; and then she would probably transmit these qualities chiefly to her adult daughters’.¹⁰⁴ In his early transmutation notebooks he had written ‘Educate all classes – avoid the contamination of <cl> castes. improve the women. (double influence) and mankind must improve –’.¹⁰⁵ This double influence was the social and biological. The move between classes (social) and castes (biological) – the deleted ‘cl’ suggesting they are not quite interchangeable – illuminates Darwin’s thinking here. Women themselves would be improved, and in turn improve (trans. verb), through the transmission of characters. While change occurs through transmission to the next generation, there is nothing to rule out change within a single lifetime, indeed education would ensure a degree of change. Even the superior strength of men is explained along lines of external causation: ‘they generally have to undergo, during manhood, a severe struggle in order to maintain themselves and their families; and this will tend to keep up or even increase their mental powers’.¹⁰⁶

While stressing continuity with other animals was in other respects a radical thing to do, and part of Darwin’s move from essence to evolution, when he moves into the arena of sex it becomes more questionable. It hardly needs to be said that humans, and human society, are more complex. Nonetheless, Darwin was careful to state that he was dealing with averages, and in a work that simultaneously emphasised the significance of individual difference and individual choice, the application of these generalisations has limits. But, most importantly, the principle of change was still the overriding one in this treatise, and must necessarily put into perspective Darwin’s generalisations about Victorian men and women.

Darwin’s theory of evolution ultimately presents a challenge to the Victorian biology of sex that endorsed female subordination. The historian Thomas Laqueur has charted a gradual shift over the course of the nineteenth century from a one-sex model of humanity, which

¹⁰²Ibid., vol. 2, 326.

¹⁰³Ibid., vol. 2, 327–8.

¹⁰⁴Ibid., vol. 2, 329.

¹⁰⁵Notebook C, in Paul H. Barrett et al., *Charles Darwin’s Notebooks: 1836–1844* (Cambridge: Cambridge University Press, 2009), 309.

¹⁰⁶Darwin, *Descent*, vol. 2, 329

held that the sexes were on a continuum, and that woman was merely an inferior version of man, to a two-sex model which held that the sexes were fundamentally different.¹⁰⁷ The sexes were increasingly differentiated along biological lines and the argument that women were fundamentally, innately, different, and that social organisation expressed this difference, became increasingly entrenched. Herbert Spencer declared that excessive education was detrimental to a woman's reproductive health, and Maudsley argued that there was 'sex in mind as distinctly as there is sex in body', stating categorically, 'sex is fundamental, lies deeper than culture, cannot be ignored or defied with impunity'. In a refusal of the dynamic process of evolution, he remarked, 'does it not appear that in order to assimilate the female to the male mind it would be necessary to undo the life-history of mankind from its earliest commencement?'¹⁰⁸

But there were no clear-cut and predictable divisions in how men and women viewed these questions of sexual difference. Women themselves drew on essentialist ideas to argue for the status quo, which in itself refutes essentialist arguments for predicting how the sexes will respond to possibilities of change. For the essayist Anne Mozley (the first critic to guess that the author of *Adam Bede* was a woman), 'when we say, in answer to the plea for the education of women, that women are not constituted by nature for the same strict, systematic, long-sustained course of study by which men are prepared for the intellectual professions, we are met by the reply that the physical training of women amongst ourselves is at fault for this'.¹⁰⁹ In her study *Women in Transition* (1907), the feminist and travel writer Annette Meakin wrote against the prohibitive theories of 'medical men' and 'plodding and conscientious biologists'.¹¹⁰ But Darwin offered a logic which would ultimately challenge these theories.

Early feminist readers saw this. While Antoinette Brown Blackwell, the New York campaigner for women's rights, declared the view Darwin shared with Spencer that 'in the processes of Evolution, man has become the superior of woman' was simply 'wrong',¹¹¹ she celebrated the implications of evolution. As men and women were evolving, and as all characters were transmitted equally to them, so they were equal:

All characters, being equally transmitted to descendants of both sexes, may remain undeveloped in either, or may be developed subject to sexual modifications; and yet, as a whole, the males and females of the same species, from mollusk up to man, may continue their related evolution, as true equivalents in all modes of force, physical and psychical.¹¹²

¹⁰⁷Thomas Laqueur, *Making Sex: Body and Gender from the Greeks to Freud* (Cambridge MA: Harvard University Press, 1990). On the gendered biases of science, see Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (1989; Cambridge MA and London: Harvard University Press, 1991); and Londa Schiebinger, *Nature's Body, Sexual Politics and the Making of Modern Science* (London: Pandora, 1993); and *The Mind has No Sex? Women and the Origins of Modern Science* (Cambridge, MA: Harvard University Press, 1989).

¹⁰⁸Herbert Spencer, *Education: Intellectual, Moral, and Physical* (London: Williams & Norgate, 1861), 186–8; Henry Maudsley, 'Sex in Mind and Education', *Fortnightly Review*, 21 (1874), 468, 477, 471.

¹⁰⁹Anne Mozley, *Blackwood's Magazine*, 106 (1869), 313.

¹¹⁰Annette Meakin, *Women in Transition* (London: Methuen, 1907), 13.

¹¹¹Antoinette Brown Blackwell, *The Sexes Throughout Nature* (New York: G. P. Putnam and Son, 1875), 22.

¹¹²*Ibid.*, 22.

The implications of evolution for sexual difference have gone relatively unnoted.¹¹³ Darwin referred to the mental faculties not only of humans but more generally in the animal kingdom as ‘certainly variable, and the variations are inherited. No one doubts that these faculties are of the utmost importance to animals in a state of nature. Therefore the conditions are favourable for their development through natural selection.’¹¹⁴ Sexual selection was likewise concerned with variation: preferred characteristics would become exaggerated over time, and the next generation would resemble those who bred. But in arguing that female choice had evolutionary consequences, Darwin was exceptional.¹¹⁵ Blackwell stressed that by Darwin’s own evolutionary logic difference of sex could not remain fixed or prescriptive:

Mr. Darwin, also, eminently a student of organic structures, and of the causes which have produced them, with their past and present characters, has failed to hold definitely before his mind the principle that the difference of sex, whatever it may consist in, must itself be subject to natural selection and to evolution.¹¹⁶

Blackwell saw the value evolution gave to arguments for social change, arguing:

Evolution has given and is still giving to woman an increasing complexity of development which cannot find a legitimate field for the exercise of all its powers within the household. There is a broader, not a higher, life outside, which she is compelled to enter, taking some share also in its responsibilities.¹¹⁷

On this reading, evolutionary change, far from inhibiting social change, necessitated it. Caird took this as the basis of her argument for equality between the sexes in *The Morality of Marriage*:

Women are the wild rice of the modern philosophical world. They are treated as if they alone were exempt from the influences of natural selection, of the well-known effects upon organs and aptitudes of continued use or disuse effects which every one has exemplified in his own life, which every profession proves, and which is freely acknowledged in the discussion of all questions except those in which woman forms an important element.¹¹⁸

Caird applied Darwinian mutability to the woman question, framing her argument: ‘Let us suppose that we had to explain, as clearly as possible, the dominant facts of our social history to some visitant from another planet.’ For this alien, sex difference would, she imagined, be far less significant than it was for the Victorians. When questioned ‘as to our educational modes’ we should explain that it was sex ‘and that alone’ which determined

¹¹³For one excellent exception, see Elizabeth Grosz, ‘Darwin and Feminism: Preliminary Investigations for a Possible Alliance?’ *Australian Feminist Studies*, 1999, 31–45. Griet Vandermassen, *Who’s Afraid of Charles Darwin: Debating Feminism and Evolutionary Theory* (Lanham MD: Rowman and Littlefield, 2005), seeks to see in Darwin possibilities for feminist allegiance, but while seeming to argue for process and dynamic development falls back on the idea of innate differences.

¹¹⁴Darwin, *Descent*, vol. 2, 390.

¹¹⁵On Darwin and sexual selection, see Helena Cronin, *The Ant and the Peacock: Altruism and Sexual Selection from Darwin to Today* (Cambridge: Cambridge University Press, 1991). On ways in which women writers engaged with these ideas, arguing for the importance of female sexual selection for the health of the British race see Richardson, *Love and Eugenics*, especially chapters five, six, and seven.

¹¹⁶Blackwell, *The Sexes Throughout Nature*, 16.

¹¹⁷*Ibid.*, 135.

¹¹⁸Caird, *The Morality of Marriage*, repr. in Heilmann (ed.), *Late Victorian Marriage Question*, vol. 1, 93.

how girls would be educated, 'irrespective of every other fact'.¹¹⁹ On the other hand, boys on account of their sex were educated 'with the view of developing whatever talent they might possess'. Caird refuted innate difference (sex difference was but one of many differences between individuals, and did not inevitably entail others), drawing an analogy with professions:

We should only laugh at any one who urged that, for instance, a sailor had been from birth incapable of understanding a legal document; that had he chosen the barrister's profession, instead of his own, he would, to the end of his days, have betrayed an ineradicable tendency to run up masts and dance the hornpipe.¹²⁰

Both social and biological change required the emergence of individual differences. Development was, as Darwin showed, dependent on variation: in his chapter on circumstances favourable to natural selection, he wrote of the conditions for favourable variation. For Caird, 'the conditions of life for women have been a national disaster for no race can afford to risk the results of such paralysing uniformity'. Urging an evolutionary perspective she debunked the myth of perfect forms:

Now, it is popularly understood that the whole race of women has been specially created in order to occupy precisely the position which they occupy at this era, with precisely the amount of freedom now accorded, neither more nor less for the happy moment has apparently arrived when matters have reached perfection.¹²¹

The gendered ideology of Victorian Britain is exposed here, and through the logic of Caird's novels, as deeply unscientific.

The Victorian press buzzed with anxiety over women reading Darwin. It is unlikely it would have reacted in this way if he had endorsed the status quo. According to *The Globe* 'We dare not say what ladies ought to read or ought not to read now-a-days, but we may venture to hint that they should not be seen floundering beyond their depth'.¹²² The reviewer masked anxieties by making light of the idea that women would be able to understand Darwin: 'Young ladies are able to talk a little on the descent of man, and, although the peculiar philosophy of the origin of species might be too much for them, they contrive at any rate to get the amusing facts and illustrations of the theory into their heads for conversational use.'

As I have shown, continuing claims in the media for essential differences between men and women appeal to the very science, evolutionary biology, which challenges such claims by revealing the overriding significance of environmental pressures and influences. The implications of evolution for questions of sexual difference have yet to be fully acknowledged and the assumption that biology is necessarily deterministic or prescriptive is ill-founded. Darwin's ideas show a close correspondence with Mill's emphasis on individual liberty and experiments in living, and proved to be valuable to Victorian women writers in countering prohibitive essentialist ideas about sexual difference. Observing change and

¹¹⁹'Suppression of Variant Types', repr. in Heilmann (ed.), *Late Victorian Marriage Question*, vol. 1, 206.

¹²⁰*Ibid.*, 207.

¹²¹*Ibid.*, 206

¹²²'Darwin in the Drawing Room', *The Globe*, 7 November 1872. Darwin kept a copy of this in his scrapbook of reviews (DAR226, Darwin Archive, Cambridge University Library).

rejecting the possibility of stasis, regardless of whether it was desirable, Darwin challenged fundamental beliefs about how things were, bringing a new importance both to observation of the present and to historical change, and his ideas find resonance today in a new emphasis on malleability in biology. Scientific claims are neither beyond question nor without positive implications for social change, and developmental biology holds vital potential for human freedom.

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