



Darwin and Feminism: Preliminary Investigations for a Possible Alliance

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... whatever exists, having somehow come into being, is again and again reinterpreted to new ends, taken over, transformed and redirected by some power superior to it; all events in the organic world are a subduing, a *becoming master*, and all subduing and becoming master involve fresh interpretation, an adaptation through which all previous 'meaning' and 'purpose' are necessarily obscured or even obliterated.¹

[Darwin has] not succeeded in explaining living beings, but in constituting them as witnesses to a history, in understanding them as recounting a history whose interest lies in the fact that one does not know a priori what history it is a question of.²

Darwin and Contemporary Feminism

Traditionally, there has been a strong resistance on the part of feminists to any recourse to the question of nature. Within feminist literature and politics, nature has been regarded primarily as a kind of obstacle against which we need to struggle, as that which remains inert, given, unchangeable, resistant to historical, social and cultural transformations.³ The suspicion with which biological accounts of human and social life are treated by feminists, especially feminists not trained in the biological sciences, is to some extent understandable. 'Biology' designates not only the *study* of life but has also come to refer to the body, to organic processes or activities that are the *objects* of that study. Feminists may have had good reasons to object to the ways in which the *study*, the representations and techniques used to understand bodies and their processes and activities have been undertaken—there is clearly much that is problematic about many of the assumptions, methods and criteria used in some cases of biological analysis, which have been actively, if unconsciously, used by those with various paternalistic, patriarchal, racist and class commitments to rationalise their various positions. But there is a certain absurdity in objecting to the notion of nature or biology itself, if this is (even in part) what and where we are. If we *are* our biologies, then we need a complex and subtle account of that biology if it is to be able to more adequately explain the rich variability of social and political life. It needs to be an open question: how does biology, the bodily existence of individuals (whether human or non-human) provide the conditions for culture and for

history, those terms with which it is traditionally opposed? What are the virtualities, the potentialities, within biological existence that enable cultural, social and historical forces to work with and actively transform that existence? How does biology—the structure and organisation of living systems—facilitate and make possible cultural existence and social change?

It seems remarkable that feminists have been so reluctant to explore the theoretical structure and details of one of the most influential and profound theoretical figures of the modern era, Charles Darwin. For the last two decades or more, there has been an increasingly widening circle of male texts that have enthralled and preoccupied the work of many feminist theorists: Hegel, Nietzsche, Spinoza, Heidegger, Derrida, Lacan and Deleuze are just some of the more recent and philosophically oriented additions to this ever-expanding pantheon. This makes the virtual ignorance and neglect of Darwin's work even more stark and noticeable. It is not clear why Darwin—whose enduring impact on knowledge and politics is at least as strong as that of Hegel, Marx or Freud—has been left out of feminist readings.

Some feminist theorists, it is true, have made tentative approaches to a theoretical analysis of his scientific contributions. The most open has been Janet Sayers.⁴ She carefully distinguishes Darwin's theory from the more pointedly politicised and self-serving readings of the social Darwinists and their contemporary counterparts, sociobiologists. Darwin's theory of evolution, she suggests, implies 'that the species characters are not fixed but change as the effect of chance variation and of selection of those variations that prove relatively well adapted to prevailing environmental conditions'.⁵ She sees it as a model which signals an open-ended becoming, a mode of potentially infinite transformation, which may prove helpful in feminist struggles to transform existing social relations and their concomitant value systems. Sadly, she notes this insight but leaves it largely undeveloped.

Other feminists, especially those working within evolutionary biology, have actively welcomed a Darwinian mode of explanation, but have commonly reduced Darwinism to a form of determinism, to a partial explanation, to be placed alongside of, or in parallel with, social and cultural accounts. This seems to be the most pervasive feminist position *within* evolutionary Darwinism. Patricia Adair Gowaty, the editor of the only anthology specifically directed to exploring the relations between Darwinism and feminism, may serve here as representative of this trend. She claims that Darwinism is a discourse parallel with feminist social and political analyses. It functions in a different but contiguous conceptual space, outside the political interests of feminists. In attributing it a *neutral*, non-infecting position *vis-à-vis* political, psychological and cultural theory, she has effectively secured Darwinism against its own most radical insights (a fundamental *indetermination* seems one of the most exciting elements of Darwin's contributions to both science and politics), and insulated feminism against theoretical impact on or being transformed by Darwinism:

There are multiple foci of analysis in the modern biological study of behavior (including social behavior and social organization of both human and nonhuman animals). We ask questions about neuronal causation (How do sensory signals contribute to 'cause' behavior?), about hormonal causation (How do hormonal signals 'cause' behavior?). How do cognitive processes 'cause' behavior? How do genes cause behavior? How do emotions or feelings cause behavior? None of these levels of foci of analysis are alternative to one another, meaning that each of these levels of causation or foci of analysis might

(probably) simultaneously work to 'cause' the expression of this or that behavior (including sexist behavior of all kinds).⁶

Clearly uneasy at the notion of causation in these accounts,⁷ Gowaty reduces both Darwinism and feminism to positions on two sides of a mutual divide. They occupy different levels or foci, each provides a 'proximate explanation' of its own fields of endeavour, which do not come into direct contact. Gowaty's use of Darwinism implies both a *reduced* view of feminism (feminism as the struggle for social parity) and a *reduced* view of science (science as the search for causal relations), as well as a commitment to the impossibility of their interaction.

Sue V. Rosser outlines, and appears largely to endorse, the more critical attitude with which most other feminists have regarded Darwin's apparent androcentrism:

[M]any feminist scientists have critiqued Darwin's theory of sexual selection for its androcentric bias. The theory of sexual selection reflected and reinforced Victorian social norms regarding the sexes ... Expanding considerably on the theory first presented in the *Origin*, Darwin specified, in the *Descent of Man*, how the process functions and what roles males and females have in it ... According to the theory, the males who triumph over their rivals will win the more desirable females and will have the most progeny, thereby perpetuating and increasing, over numerous generations those qualities that afforded them victory.⁸

In shorthand, Darwin's is a theory of 'winners and losers', of the dominating and those who have succumbed to domination or extinction, a theory that, on the face of it, seems to provide a perfect justification for the relations of phallogocentric and racial domination that constituted Eurocentric, patriarchal culture in his time as much as in ours. Darwinism, it is claimed, justifies, rather than provides the tools by which to problematise, relations of domination and subordination between races and sexes, as well as the domination of the human over the natural.

These claims are strikingly similar to those that surrounded Freudian psychoanalysis in the estimation of feminists openly hostile to its possible theoretical contributions some two decades ago—what Freud (Darwin) says about women is phallogocentric, rooted in the natural subordination of women to men—it is sexist and biased. The theory privileges the masculine, and positions the feminine as its subordinated and complementary counterpart. While this is undoubtedly true, more or less, of any discourse written before the development of feminism as a theoretical and political movement, it evades the more interesting question: without necessarily minimising these investments in male privilege, do these discourses provide theoretical models, methods, questions, frameworks or insights that could nevertheless be of some use in understanding and transforming the prevailing structures of (patriarchal) power and in refining and complexifying feminist analyses of and responses to these structures? Psychoanalytically oriented feminists have demonstrated, even while recognising many of the limits of Freud's work, that it provides an account of the unconscious, and of the acquisition of sexual identity that has proved crucial, if not indispensable, to the ways feminist theorists have come to understand subjectivity and desire. It seems timely to suggest that Darwin may himself prove to be as rich, complex, ambivalent and rewarding a figure for feminists to investigate as Freud has been. His writings may provide feminism with richer and more workable concepts of nature, time, and transformation than those available to it from the discourses of cultural and political theory, history or philosophy.

Darwin's work offers a subtle and complex critique of both essentialism and teleology.

It provides a dynamic and open-ended understanding of the intermingling of history and biology (indeed it is Darwin's work that most actively affirms the irreversibility of time within the natural sciences), and a complex account of the movements of difference, bifurcation, and becoming that characterise all forms of life. His work develops an anti-humanist, 'algorithmic', that is, mechanical or fundamentally mindless, analysis of biological dynamics which refuses to assume that the temporal movement forward can be equated with development or progress. His work affords us an understanding of the productivity, the generative surprise, that the play of repetition and pure difference—the ongoing movement of biological differences and their heritable reproduction through slight variation, which he affirms as 'individual variation'—effects the becoming of species. He is perhaps the most original thinker of the link between difference and becoming, between matter and its elaboration as life, between matter and futurity. Moreover, his work pays specific attention to the question of sexual difference, to which he grants a prominence as an autonomous feedback loop within the larger and more overarching operations of natural selection. The status and function of sexual selection, and the intense variability, or difference he sees both within each sex and between the sexes, as well as within and between species and genera, occupies a central, if ambiguous, position in his work that is worthy of serious feminist investigation.

These seem to provide at least *prima facie* reasons why it may prove fruitful for feminists to cast their critical gaze at Darwin, not simply with the *a priori* aim of dismissing his work, as has been the case in many feminist responses to any kind of biological analysis, or of simply accepting it and developing scientific research projects and paradigms that function to illustrate or refine its principles, as seems to have occurred with the largely revisionist ambitions of feminist approaches to evolutionary biology. Rather, with the desire to see what may be of value for providing feminist theory with richer and more subtle intellectual resources to both attain its aims and to refine its goals. The rest of this paper will be devoted to an exploratory discussion of the key elements of Darwin's account of evolution, and some feminist implications that arise from it.

Darwinian Evolution

Although the most essential elements of Darwin's understanding of evolution are relatively straightforward and generally well known, there is a great deal of contention regarding the ways in which scientists and non-scientists have interpreted its most basic precepts. *The Origin of Species*⁹ has two aims: first, to demonstrate that contemporary species and forms of life are descended from earlier forms: if there is an 'origin' of species (a question, ironically, that Darwin doesn't directly discuss, in spite of the title of his major work), it is in earlier species, and their transformations. And second, to demonstrate how such an evolution, a 'descent with modification', is possible, and what processes and mechanisms enable both modification and descent to produce viable new species from the mutability and transformability of existing species. In this sense, Darwin offers an account of the *genesis of the new* from the play of repetition and difference within the old, the generation, in effect, of time and history from the impetus and mobility of existing species.

Darwin claims that three basic and closely linked principles explain the contrary forces involved in the evolution of species—the forces of individual variation, the proliferation of species and individuals, and the play of natural selection. The evolution of life is possible only through the irreversible temporality of genealogy, which requires an abundance of variation, mechanisms of indefinite, serial or recursive replication/

reproduction, and criteria for the selection of differential fitness. When put into dynamic interaction, these three processes provide an explanation of the dynamism, growth and transformability of living systems, the impulse towards a future that is unknown in, and uncontained by, the present and its history. I will briefly outline each of these three principles.

First, there is the postulate of a vast but often minute series of individual variations which may eventually lead to the formation of different species, that is, the postulate of diversity. This is the proliferation of individuating characteristics and features that may prove more or less significant in the successful adaptation of individuals or species to their environments. While a large number—the majority—of variations are either irrelevant to or positively harmful for the ongoing existence of species, there are random variations which do or will prove a positive improvement relative to the environment, whether it is fixed or changing.

No one supposes that all the individuals of the same species are cast in the very same mould. These individual differences are highly important for us as they afford materials for natural selection to accumulate, in the same manner as man can accumulate in any given direction individual differences in his domesticated production.¹⁰

Second, there is an invariable tendency to superabundance, excessiveness, in the rates of reproduction and proliferation of both species and individuals. Even if they merely reproduce their own numbers, they will eventually encounter scarcity and thus a hostile environment. This proliferative superabundance can be understood, more negatively, as the struggle for existence, in which this superabundance drives species and individuals to compete with each other for increasingly limited resources:

There is no exception to the rule that every organic being naturally increases at so high a rate that if not destroyed, the earth would soon be covered by the progeny of a single pair.¹¹

This teaming proliferation of individuals and species suggests that the greater the proliferation of diversity, the more natural selection is able to take effect. If species reproduced themselves in ever-diminishing numbers, natural selection would be unable to weed out the less fit and provide space for the selection and profusion of the more fit.¹² The proliferation of numbers and the production of greater and greater variability is restrained by a number of factors. While variation and proliferation are the very motors of the production of evolutionary change, there are nevertheless a series of limits on the degree of variability. The range and scope of diversity and variability cannot be determined in advance, but it is significant that there are inherent, if unknown, limits to tolerable, that is to say, sustainable variation: ‘monstrosities’, teratological variations, may be regularly produced, but only those which both remain viable and reproductively successful, and only those which attain some evolutionary advantage, either directly or indirectly, help induce this proliferation.

Taken together, the two principles of individual variation and the heritability of this variation imply that if there is a struggle for existence in circumstances where resources may be harsh or scarce, then any variation, however small and apparently insignificant, may provide an individual with advantages which may differentiate and privilege it relative to other individuals. Even minute variations may provide major advantages, especially in unexpected circumstances. Moreover, if individual variations are inherited, whatever small advantages were bestowed on an individual may be amplified over time. It is in this capacity for individual variation that Darwin locates the origin of species and

genera. Once individual variations are selected and become a force in heritable characteristics, and if there is some separation, geographical or ecological, between such individually differentiated groups, the conditions under which a new species, or several, emerge from common ancestors becomes clear:

New species are formed by new varieties arising, which have some advantage over older forms; and those forms, which are already dominant, or have some advantage over the other forms in their own country, would naturally oftenest give rise to new varieties or incipient species; for these latter must be victorious in a still higher degree in order to be preserved and to survive.¹³

Third, and as a counterbalancing yet interrelated force to these ongoing interactions between individual variation, the struggle for existence and the inheritance of variation, is the postulate of natural selection. Natural selection functions, either by inducing proliferation, or by providing a hostile, or conducive, environment, to select from the proliferation of life forms, those which survive and provide reproductive continuity with succeeding generations. As its name suggests, natural selection is the process, or rather processes (for it includes both artificial and sexual selection; see below) which provides selection criteria which serve to give significance and value to individual variations:

If ... variations useful to any organic being do occur, assuredly individuals thus characterised will have the best chance of being preserved in the struggle for life; and from the strong principle of inheritance they will tend to produce offspring similarly characterised. This principle of preservation, I have called, for the sake of brevity, Natural Selection; and it leads to the improvement of each creature in relation to its organic and inorganic conditions.¹⁴

Darwin describes natural selection as the 'principle of preservation', but this preservation is quite ambiguous and multi-layered. It preserves only those variations which can viably function within its parameters or conditions, and which show some marked or significant advantage over their competitors. The principle of preservation is the preservation of the fittest, of the most appropriate existences in given *and* changing circumstances. Through its selective capacities, natural selection provides both a negative mechanism, which functions to eliminate much of the proliferation generated by the hyperabundance of individual variation, indirectly sorting or sifting through the variations between individuals and species; and also a more positive productivity, when it functions as the source of a pressure on those individuals and species which survive to even greater proliferation and divergence.¹⁵

Natural selection is rendered more intricate and complicated through the input of its two particular variations, artificial selection and sexual selection. Artificial selection, the selective breeding of life forms through the human introduction of selection criteria, may provide a model for understanding the more general, overarching but less visible relations of natural selection. Rather than being construed as polar opposites, as cultural and natural binaries, natural and artificial selection are regarded as two versions of the same thing, the artificial functioning according to the same principles as natural selection, but varying the criteria for selection according to the aesthetic, material or experimental investments of human breeders.

Sexual selection functions not in opposition to or as a separate stream from natural selection, but as one of the offshoots of natural selection, and one of its more specific techniques for ensuring the detailed elaboration and functioning of the criteria of survival and reproductive success. While space limitations prevent a more elaborated discussion of the details and intricacies of sexual selection, it is significant that the bulk of feminist

literature on Darwinism is devoted to a discussion, usually a critique, of Darwin's account of sexual selection.¹⁶ Yet sexual selection is clearly both a sub-branch of natural selection (those beings which reproduce sexually have an evolutionary advantage over their hermaphroditic counterparts in certain conditions), and an additional inflection, an intricate feedback loop, further complexifying natural selection processes, adding other criteria (primarily, attractiveness to the opposite sex), to its operations. Sexual selection adds more aesthetic, and immediately or directly individually motivating factors to the functioning of natural selection, and deviates natural selection through the expression of the will, or desire, or pleasure, of individuals. Sexual selection, while conforming in the long run to the principles of natural selection, nonetheless may exert a contrary force to the pure principle of successful survival. Darwin notes that many features of animal appearance and adornment, even those which may in some way render the being less able to survive, more noticeable to predators, less able to protect themselves than their dowdier yet fitter counterparts, nevertheless have survival value. In the case of the spectacular plumage of the peacock relative to the plainness of the pea-hen, Darwin's explanation is that even if its plumage and adornment make the peacock more vulnerable to attack, the more magnificent its colouring, the more bright and striking its tail-feathers, the more the attractiveness of the peacock to the peahen is enhanced. While it is or may be disadvantaged in the stakes of natural survival, it is positively advantaged in the stakes of sexual selection.¹⁷

Sexual Selection and Race

It is significant that Darwin wants to link the question of sexual selection to the descent of the different races of man. Sexual selection—taste, individual choice—may have dictated that what were once slight variations in individual racial characteristics—colour, features, proclivities—would, if linked to sexual selection, provide criteria by which males and females choose each other as sexual and reproductive partners. Racial differences cannot be attributed directly or solely to the selective pressures imposed by environments:

If ... we look to the races of man, as distributed over the world, we must infer that their characteristic differences cannot be accounted for by the direct action of different conditions of life, even after exposure to them for an enormous period of time.¹⁸

Rather than claim racial differences as the simple result of the selective capacities of extremes of environment, Darwin suggests that it may be precisely the sexual appeal or attractiveness of individual racial variations, however slight they may have been to begin with, that explains the historical variability and the genealogical emergence of racial differences. Racial differences may have been those differences that have been actively selected by individuals, and perhaps amplified through geographical dispersion and the subsequent geographical and/or cultural isolation from racially less differentiated ancestors:

We have thus far been baffled in all our attempts to account for the differences between the races of man; but there remains one important agency, namely Sexual Selection, which appears to have acted as powerfully on man, as on any other animal. I do not intend to assert that sexual selection will account for all the differences between races. An unexplained residuum is left. ... It can be shewn that the differences between the races of man, as in colour, hairyness,

form of features etc. are of the nature which it might have been expected would have been acted on by sexual selection.¹⁹

Sexual selection inflects, and is possibly productive of, racial differences in the more stark and clear-cut forms racial difference has today, even if it is not the only contributing factor. What were once small, possibly biologically insignificant but sexually significant, characteristics, exert a force in the functioning of sexual attraction, and it is this sexual appeal that gives these otherwise insignificant characteristics a key role to play in inheritance and long-term survival.²⁰ Sexual selection provides a powerful force in the operations of natural selection; while it may sometimes work in concordance with natural selection, at other times, it deviates natural selection through the detour of individual sexual preference.

Natural selection is the active, selective and ever-transforming milieu of evolutionary change. It consists in what we understand as the biological context of any existent, which is comprised largely, but not entirely, of the other living beings in their various interactions with each other. It also consists in the geographical, climatological and highly specific material context for each existent. These conditions enable natural selection to provide ever-changing criteria by which both fitness and survival are measured.²¹ Natural selection is not simply a passive background or context in which individual variation unfolds, a mere landscape that highlights and positions the living being; rather it is a dynamic force which sets goals, provides resources, and incentives for the ever-inventive functioning of species in their self-proliferation.

Between them, these three principles on the one hand provide an explanation of a series of processes and interactions that are fundamentally mindless and automatic, but on the other hand, that are also entirely unpredictable and inexplicable in causal terms. Dennett has described this as Darwin's 'dangerous idea': that the 'excellence of design', the apparently perfect adaptation of species to the specificities of their environment and for long-term survival, is the result of both serendipity or chance, and the fundamentally blind and mindless system of selection that relentlessly weeds out and diminishes the effects and operations of the less adapted, thus providing an evolutionary advantage to the more and better adapted.²² As long as the time scale of evolutionary unfolding is long enough, the mindless automatism of natural selection and the spontaneous production and inheritance of variation have time enough to ensure that experiments in living, as they might be called, living in a variety of environments under a variety of conditions, produce maximal results from given resources. These results then feed into the resources to actively transform them, which in turn transforms the stakes involved in selection.

Darwin has outlined a marvellous machine of production of the new, which constrains the new only through the history that made it possible, and the present which it actively transforms, but which leaves its directions, parameters and destinations unknown and unknowable. Where variation tends to occur through small, slow accretion, that is, where variation and inheritance function in large-scale or cosmological time, natural selection may, at times, function through catastrophic leaps, major climatological or population changes, sudden and unpredictable upheavals. Its temporality is more, but not only, short-time, intensified. It is in part the clash between the generally (but not universally) slow relentlessness of genetic variability and change, and the cataclysmic time of natural selection—that is between two durational forms, two different rhythms of becoming, that the new is generated.

If Darwin locates chance at the centre of natural selection, as that which indicates an organism's openness, its potentially mortal susceptibility to changing environments,

environments hitherto unseen or not yet in existence ('fitness' designating not superiority in a given milieu or environment but rather the adaptability of the organism, in its given state, to changing environments—a notion of fitness more in keeping with Darwin's own writings than any corporatised reading of evolutionary theory will allow), then from this time on, the random, the accidental, that which befalls an individual entity, becomes an essential ingredient in the history and development of that entity. Chance erupts at both the level of random variation and at the level of natural selection, and perhaps, more interestingly, in the gap or lag that commonly exists in their interaction. At the level of individual variation, chance emerges in the processes, unknown to Darwin at the time and still today, of genetic reproduction and recombination, which produces multiplicitous, usually minute, and usually insignificant variations in organisms. What dictates these variations is both unknown, and in some sense irrelevant, at least as far as natural selection is concerned, for it works only on the viable and inherited results of such randomness. At the level of natural selection, Darwin suggests that changes in the environment, and in the various pressures facing organisms within that environment, are also unpredictable. But more significant than the randomness of either individual variation or the randomness of natural (or artificial) selection is the randomness of individual variation *relative to* natural selection. Furthermore, the randomness of individual variation, while in no sense causally connected to the randomness of natural selection, may actively transform the criteria by which natural selection functions.²³ In other words, evolution is a fundamentally open-ended system which pushes towards a future with no real direction, no promise of any particular result, no guarantee of progress or improvement, but with every indication of inherent proliferation and transformation.

Darwin and Culture

It is not clear that Darwin wanted to differentiate between natural and cultural systems in his understanding of the differential selection of surviving variation. Evolution functions through reproduction, variation and natural selection: as such, it should also, in principle, be able to explain the function of cultural phenomena, such as language.

The 'origin' and history of languages function according to the same logic of temporal dispersion and natural selection as the origin and history of species: in a sense, the matter through which such a logic operates, whether it is the matter of biology or of spoken and written languages, is of less significance than the principles which govern it. And these principles are fundamentally bound up with the effectivity or use of that matter, and the weeding-out effects that this effectivity generates in its confrontation with an environment. It is thus not entirely surprising, though it seems to have evaded the reflections of some scientists working in the area, that Darwin has posited the same processes of production in natural as well as in avowedly cultural activities. His refusal to restrict the forces of evolution to biological or natural activities, while deeply resented and questioned by some feminists, may prove to be part of the strength of his understanding, and its value for feminist theory. The force of his argument resides in the fact, as Dennett makes clear, that evolution, if it functions as an explanatory model at all, functions all the way up, from the lowliest species to the most elevated of cultural and intellectual activities.²⁴ The systematic cohesion of modes of reproduction (forms of repetition) with their resulting mutations which are imperfect or innovative copies (forms of difference) and modes of 'natural' selection (systems of differentiation) produces a system, or rather,

an asystematic systematicity, that is co-extensive with all of life, life in its detail, life in its political and cultural as well as its natural forms.

The question remains: what can feminists learn from Darwin? Of what use can Darwin's work be for feminist intellectual and political struggles? If Darwin's work provides a fundamental, indeed, canonical model for the biological sciences, is Darwin worth even considering for those feminists who do not work in the area of biology? These are difficult questions which cannot be readily answered in the space of a short article. They require not only an openness to texts and positions that many feminists have, sometimes dogmatically, asserted are hostile to feminist interests (the discourses of nature and biology), they also require a different understanding of feminism itself. No longer is feminism the political guardian of what is good for women, for what feminist politics is, how it functions, what its aims, goals and methods are and how they should be assessed. These are as open to questioning and contestation as any other position or politics, for these are questions that cannot be taken for granted or settled. It is only if feminist theory is itself put at risk in what we might understand as its own 'evolutionary' modes of self-overcoming, where it is confronted with its own limits, where it is placed in new situations and contexts, that its own explanatory power, its power to enhance both understanding and action, is tested against others, and, ideally, transformed and expanded. A more open feminist inquiry into the value and relevance of *any* discourse, not just Darwin's, involves not just feminist critique, not simply inspection for errors and points of contention, but more passively and thus dangerously, a preparedness to provisionally accept the framework and guiding principles of that discourse or position in order to access, understand and possibly transform it.

I can only suggest here in broad outline some of the possible ramifications that Darwin's understanding of evolution may have for the re-evaluation (transvaluation?) of feminist discourses and methods.

1. Darwin's model of evolutionary unfolding provides a striking response to various theories of oppression. Oppression is the result of operations of systems of harm and injustice which privilege the bodies and activities of some at the expense of others. What Darwin's work makes clear is that what has occurred to an individual in the operations of a milieu or environment (it matters little here if it is natural or cultural) is the force or impetus that propels that individual to processes, not of remediation (remediation literally involves undoing what cannot be undone), but of self-transformation. The struggle for existence is precisely that which induces the production of ever more viable and successful strategies, strategies whose success can only be measured by the degree to which they induce transformation in the criteria by which natural selection functions.²⁵ This means that feminism itself must undergo continuous revision and revitalisation, a thorough self-transformation of its basic presumptions, methods and values, including its understanding of the harms and wrongs done to women. Evolution and growth, in nature as in politics, are precisely about overcoming what has happened to the individual through the history, memory, and innovation open to that individual as a result of that history. This is true of the survival of species as much as it is of the survival of political strategies and positions, historical events and memories. It is only insofar as past wrongs, 'injuries', are the spur to forms of self-overcoming that feminist, or anti-racist, struggles are possible and have any hope of any effectivity. Darwin makes it clear that self-overcoming is incessantly, if slowly, at work in the life of all species. Politics is an attempt to mobilise these possibilities

- of self-overcoming in individuals and groups. The logic by which this self-overcoming occurs is the same for natural as for social forces;²⁶
2. This logic of self-overcoming, the motor of Darwinian evolution, must be recognised not only as a distribution of (geographical and geological) spacing, processes of spatial dispersion and isolation but, above all, as a form of temporisation, in which the pull of the future exerts a primary force. Beings are impelled forward to a future that is unknowable, and relatively uncontained by the past. It is only retrospection that can determine what direction the paths of development, of evolution or transformation, have taken and it is only an indefinitely deferred future that can indicate whether the past or the present provide a negative or positive legacy for those that come. This means that history and its related practices (geology, archaeology, anthropology, psychoanalysis, medical diagnosis, etc.) are required for understanding the current, always partial and residual situation as an emergence from a train of temporal events already given, which set the terms for, but in no way control or direct, a future fanning out or proliferation of the present. The future follows directions latent or virtual in, but not necessarily actualised by, the present;
 3. One of the more significant questions facing contemporary feminist theory, and indeed all political discourses, is precisely what generates change, how change is facilitated, what ingredients, processes and forces are at work in generating the conditions for change, and how change functions in relation to the past and the present. Darwin presents here, in quite developed if not entirely explicit form, the elements of an account of the place of futurity, the direction forward as the opening up, diversification or bifurcation of the latencies of the present, which provide a kind of ballast for the induction of a future different, but not detached, from the past and present. The future emerges from the interplay of a repetition of cultural/biological factors, and the emergence of new conditions of survival: it must be connected, genealogically related, to what currently exists, but is capable of many possible variations in current existence. The new is the generation of a productive monstrosity;
 4. Darwin provides feminist theory with a way of reconceptualising the relations between the natural and the social, between the biological and the cultural, outside the dichotomous structure in which these terms are currently enmeshed. Culture cannot be seen as the overcoming of nature, as its ground or mode of mediation. According to Darwinian precepts, culture is not different in kind from nature. Culture is not the completion of an inherently incomplete nature (this is to attribute to Man, to the human and to culture the position of destination of evolution, its telos or fruition, when what Darwin makes clear is that evolution is not directed towards any particular goal and has no destination). Culture cannot be viewed as the completion of nature, its culmination or end, but can be seen as the ramifying product and effect of a nature that is ever-prodigious in its techniques of production and selection, and whose scope is capable of infinite and unexpected expansion. Language, culture, intelligence, reason, imagination, memory—terms commonly claiming as defining characteristics of the human and the cultural—are all equally effects of the same rigorous criteria of natural selection: unless they provide some kind of advantage to survival, some strategic value to those with access to it, there is no reason why they should be uniquely human attributes, or unquestionably valuable attributes. Darwin affirms a fundamental continuity between the natural and the social, and the complicity, not just of the natural with the requirements of the social, but also of the social with the selective procedures governing the order and organisation of the natural;

5. Darwin's work may add some welcome layers of complexity to understanding the interlocking and entwinement of relations of sexual and racial difference. His work makes clear how sexual selection, that is to say, relations of sexual difference, may have played a formative role in the establishment of racial differences in the terms in which we know them today, and moreover, how racial variations have fed into and acted to transform the ways in which sexual difference, subjected to the laws of heredity, is manifested. Darwin provides an ironic and indirect confirmation of the Irigarayan postulation of the irreducibility, indeed, ineliminability, of sexual difference, and its capacity to play itself out in all races and across all modes of racial difference.²⁷ Darwin's work indirectly demonstrates the way that racial and bodily differences are bound up and complicated by sexual difference and the various, transforming criteria of sexual selection;
6. Darwin's work, with the centrality it attributes to random variation, to chance transformations and to the unpredictable, has provided and will continue to provide something of a bridge between the emphasis on determinism that is so powerful in classical science and the place of indetermination that has been so central to the contemporary, postmodern, form of the humanities. Evolution is neither free and unconstrained, nor determined and predictable in advance. It is neither commensurate with the temporality of physics and the mathematical sciences, nor is it unlimited in potential and completely free in direction. Rather, it implies a notion of overdetermination, indetermination and a systemic openness that precludes precise determination. This is the temporality of retrospection, of reconstruction, but a reconstruction whose aim is never the faithful reproduction of the past so much as the forging of a place for the future as the new; and
7. Darwin has provided a model of history that resorts neither to the *telos* or a priorism of the dialectic, nor to a simple empiricism which sees history simply as the accumulation of variously connected or unconnected events. History is both fundamentally open but also regulated within quite strict parameters. There are historical constraints on what becomes a possible path of biological/cultural effectivity: it is only that which has happened, those beings in existence, now or once, that provide the germs or virtualities whose divergence produces the present and future. That which has happened, the paths of existence actualised, preempt the virtualities that other existences may have brought with them, they set different paths and trajectories than those that might have been. History is a broader phase space than that which can be occupied by living beings. And the history or genealogy of living beings transforms and magnifies this phase space, the space of virtualities or latencies, as they transform themselves. While time and futurity remains open-ended, the past provides a propulsion in directions, unpredictable in advance, which, in retrospect have emerged from the unactualised possibilities that it yields.

While I am not suggesting that feminists now need to become adherents and followers of Darwin, as in the past it was imperative to embrace the discourses of Marx, or Freud or Lacan, I am claiming that there is much of significance in Darwin's writings that may be of value for developing a more politicised, radical and far-reaching feminist understanding of matter, nature, biology, time and becoming, among other things. His work is not 'feminist' in any sense, but as a profound and complex account of the organic becoming of matter, of the strategies of survival and multiplications of these becomings in the face of the obstacles or problems of existence that life poses for them, it is or should be of some direct interest and value for feminists.

NOTES

1. Friedrich Nietzsche, *On the Genealogy of Morals* (Vintage Books) New York, 1967, p. 77.
2. Isabelle Stengers, *Power and Invention. Situating Science* (University of Minnesota Press) Minneapolis, 1997, p. 171.
3. There is, of course, no unanimity in any feminist endeavour. There are certainly a number of feminists who have actively lauded the virtues of women's connections with nature. These have been variously described as cultural feminists, radical feminists and eco-feminists. This project must be carefully differentiated from the interests of eco-feminism and its cognates on several grounds: (1) this project is directed primarily at ontological and epistemological claims, while eco-feminism seems largely oriented to ethical, moral and economic issues; (2) this project disputes the *a priori* commitment to (w)holism, the presumption of the interconnectedness of ecological, and even cosmological issues into a systematic whole that lies at the basis of much ecological and eco-feminist thought. It argues that Darwin's work stresses difference, divergence, bifurcation and division, the fracturing of a social and biological field, rather than interconnectedness and wholeness. It is the *asystematicity* of the Darwinian system that is of interest to me here; and (3) this project is not concerned with placing women in a different position from men in their relations to nature; women have no more, nor any less, connection to the natural (or the social) order. The question here is not to explore women's particular connection to nature, but rather the role that different, critically revitalised, conceptions of nature may play in our understandings of the becomings open to each sex.
4. Janet Sayers, *Biological Politics. Feminist and Anti-feminist Perspectives* (Tavistock) London, 1982.
5. Sayers, *Biological Politics*, p. 55.
6. Patricia Adair Gowaty 'Darwinian Feminists and Feminist Evolutionists' in P.A. Gowaty (ed.), *Feminism and Evolutionary Biology. Boundaries, Intersections, and Frontiers* (Chapman and Hall) New York, 1997, p. 5.
7. This explains her awkward use of quotation marks in all cases where the word 'cause' is used—except in the case of 'emotions or feelings'—that is, precisely in that situation where cause seems a conceptually inappropriate, even incoherent, term: emotions or feelings do not *cause* us to act; on the contrary, they are *reasons* why we act.
8. Sue V. Rosser, *Biology and Feminism. A Dynamic Interaction* (Twayne Publishers) New York, 1992, p. 57.
9. Charles Darwin, *The Origin of Species*, first published 1859 (Oxford University Press) Oxford, 1996, hereafter cited as *Origins*.
10. Darwin, *Origins*, p. 39.
11. Darwin, *Origins*, p. 54.
12. A high degree of variability is obviously favourable, as freely giving the materials for selection to work on; not that mere individual differences are not amply sufficient, with extreme care, to allow of the accumulation of a large amount of modification ... When the individuals of any species are scanty, all the individuals, whatever their quality may be, will generally be allowed to breed, and this will effectively prevent selection. (Darwin, *Origins*, p. 35.)
13. Darwin, *Origins*, p. 263.
14. Darwin, *Origins*, pp. 104–5.
15. While the teratological influence on mutation and genetic transformation is commonly noted, there is currently a body of research on epigenetic markers that indicates a more direct relation between the forces of natural selection, or at least, environmental effects, and the heritability of genetic variations they produce:

Over the course of evolutionary time, a variety of mechanisms, mediated by epigenetic factors, have emerged to generate new variation with the potential of 'bailing out' organisms that have become dysfunctional under conditions of stress. Selection—intracellular, cell lineage, or organismic—provides the conditions under which adaptive variants can become fixed. For many organisms that normally reproduce asexually, a switch to sexual reproduction can provide this diversity. (Evelyn Fox Keller, 'Structures of Heredity', *Biology and Philosophy*, no. 13, 1998, p. 116)

16. See Rosser, p. 57:

Aside from noting its statement in terms of upper-class Victorian values and decrying the misuse of his theory of natural selection by social Darwinists, feminist scientists by and large have not critiqued the theory of natural selection. As scientists, they have recognised the significance of the theory for the foundations of modern biology. Given the strong attacks on natural selection by creationists and other groups not known for their profeminist stances,

most feminist scientists who might have critiqued some minor points have been reluctant to provide creationists with evidence they might misuse.

In contrast to accepting his theory of natural selection, many feminist scientists have critiqued Darwin's theory of sexual selection for its androcentric bias. The theory of sexual selection reflected and reinforced Victorian social norms regarding the sexes.

17. See Darwin, *The Descent of Man and Selection, in Relation to Sex*, first published 1871 (Princeton University Press) Princeton, 1981, ii, pp. 135, 157–8.
18. Darwin, *Descent*, i, p. 246.
19. Darwin, *Descent*, i, pp. 249–50.
20. Darwin makes explicit that skin colour, and racially signifying characteristics exert a *beauty*, an aesthetic force, that has had a major impact on phenotype and long-term survival:

The best kind of evidence that the colour of skin has been modified through sexual selection is wanting in the case of mankind; for the sexes do not differ in this respect, or only slightly and doubtfully. On the other hand, we know from many facts already given that the colour of the skin is regarded by the men of all races as a highly important element in their beauty; so that it is a character which would likely be modified through selection, as has occurred in innumerable instances with the lower animals. (Darwin, *Origins*, p. 381)

21. The rate by which the ever-changing status of natural selection functions is quite variable and specific: Darwin's position is closely tied to the presumption that many of these changes are imperceptible over generations, and only come to acquire significance when measured in geological or cosmological time.
22. See Daniel Dennett, *Darwin's Dangerous Idea: Evolution and the Meaning of Life* (Simon & Schuster) New York, 1995, p. 51.

What Darwin discovered was not really *one* algorithm, but rather, a large class of related algorithms that he had no clear way to distinguish. We can now reformulate his fundamental idea as follows:

Life on earth has been generated over billions of years in a single branching tree—the Tree of Life—by one algorithmic process.

That there is something fundamentally mindless and automatic about the Darwinian system is certainly one of its explanatory advantages. And Dennett is quite correct to recognise that the mindlessness of these processes renders no category, including the most hallowed of philosophy, untouched. All, reason, conscience, nobility, all the human virtues and inventions, are the long-term effects of the same kind of automatism that regulates the existence of the most humble bacteria. What is dangerous about Darwinism is that it sets the whole of cosmology into a framework of forces that are incapable of being controlled by its participants.

23. In some of the recent literature, there has been an argument that there is a non-random variation induced by natural selection—an epigenetic inheritance—that natural selection may have a more direct impact on selectable and heritable variations:

One of our major themes is that the variation on which evolutionary change is based is affected by instructive processes that have themselves evolved. In addition to random genetic change, natural selection has produced systems that alter the base sequence of DNA by responding to special external stimuli.

Other sources of heritable variation that have clearly been moulded by natural selection are the epigenetic inheritance system, which transmits information between individuals through social learning. The adaptability that these additional inheritance systems allow can be the basis of long term genetic adaptations. (Eva Jablonka and Marion J. Lamb, 'Bridges Between Development and Evolution', *Biology and Philosophy*, no. 13, pp. 120–1)

24. While Dennett provides one of the more rigorous philosophical readings of Darwinism, and has, further, acknowledged and explored the 'danger' (his term) of Darwin's idea, the threat it poses, not only to received religions, but also to those humanists who wish to attribute a post- or non-evolutionary status for the products of mind or reason—this, after all, was the limit of Alfred Russel Wallace's version of evolution: he exempted mind from the operations of evolution—Dennett himself submits to the same exigency when he distinguishes the biological evolution of species from what he describes, following Richard Dawkins's usage (in *The Selfish Gene* (Oxford University Press) Oxford, 1976), as the 'memetic' evolution of cultural and mental concepts. Dennett effectively reproduces precisely the mind/body split that he so convincingly criticises in Wallace, Stephen Gould and a series of other evolutionary thinkers. He argues that the evolution of concepts is subject to the same principles of evolution as the evolution

of biological entities. With this claim, I have no disagreement. However, he presents the evolution of ideas in a separate landscape from the evolution of biological beings, when the evolution of concepts and cultural activities can be regarded simply as the latest spiral or torsion in the function of one and the same biological evolution. For Dennett, as for Dawkins, memes are 'analogues' of genes, rather than, as Darwin himself would imply, the ramifying products of genes. (See Dennett, pp. 345, 347.) Memes are to mind what genes are to bodies!

25. I am not suggesting, to put it bluntly, that the violent persecution of various individuals or minorities is a good thing; rather, I am suggesting that, given that oppressions, harms, injustice have occurred and cannot be undone, the political task is not simply to mourn or lament them, but to use them, their memory, precisely as a spur to transformation, to difference. It is this violence, this memory of injustice and pain, that is the ballast that may serve to produce another future.
26. There are some remarkable convergences between Darwin's understanding of the movements of evolution and Foucault's understanding of the dynamics of power. While I do not have the space here to develop this claim more convincingly, it needs to be simply noted that in Darwin, as in Foucault, there is a fundamental commitment to the intangibility of the hold of domination and its ongoing and transforming susceptibility to resistance and realignment. For Foucault, power produces resistance which transforms power which produces resistances ... in a never-ending spiral of self-transformation. Resistances do not come from without but are actively generated by the forms that power itself takes, which are thereby vulnerable to the transforming effects of resistance. Neither power nor resistance has ongoing stability nor a pre-given form; each is the ramifying effect of the other. In Darwin's work too there is a sense in which the domination of individuals or species is precarious and necessarily historically limited, that the very successes of dominant groups produces the conditions for the domination of other groups which differ from them and serve to transform them. In both theorists there is an understanding of the inherent productivity of the subordinated groups—precisely *not* a theory of victors which abolish the vanquished (as many feminists have suggested), but a theory of how transformation and change remain in principle open because of the position of the subordinated, because domination remains precariously dependent on what occurs not only 'above' but also 'below'.
27. As Irigaray claims, in *I Love to You. Sketch of a Possible Felicity in History* (Routledge) New York, 1996, p. 47.

Without doubt, the most appropriate content for the universal is sexual difference. ... Sexual difference is an immediate natural given and it is a real and irreducible component of the universal. The whole of human kind is composed of women and men and of nothing else. The problem of race is, in fact, a secondary problem—except from a geographical point of view—... and the same goes for other cultural diversities—religious, economic, and political ones.

Sexual difference probably represents the most universal question we can address. Our era is faced with the task of dealing with this issue, because, across the whole world, there are, there are only, men and women.

I do not believe that Irigaray here denies the centrality of other differences, other modes of oppression. Racial relations and oppressions based on sexual preference or religious affiliation clearly have a relative autonomy from the question of sexual difference. Where Darwinism confirms Irigaray's position is in claiming that the structures of racial, religious and sexual orientation are open to potentially infinite historical transformation, given a long enough period of time, in ways that may or may not be true for sexual difference. This in no way places sexual difference outside historical or biological transformation, nor does it render it any more significant than other forms of oppression in explaining the complexities of social and cultural evolution; it simply insists that whatever other factors are at work, sexual difference must be a consideration, a relevant factor.

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