



Michael Ruse's Design for Living

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Abstract. The eminent historian and philosopher of biology, Michael Ruse, has written several books that explore the relationship of evolutionary theory to its larger scientific and cultural setting. Among the questions he has investigated are: Is evolution progressive? What is its epistemological status? Most recently, in *Darwin and Design: Does Evolution have a Purpose?*, Ruse has provided a history of the concept of teleology in biological thinking, especially in evolutionary theorizing. In his book, he moves quickly from Plato and Aristotle to Kant and such British thinkers as Paley and Whewell. His main focus, though, is on Darwin's theory and its subsequent fate. Ruse rests his history on some shaky historical and philosophical assumptions, particularly the unexamined notion that evolutionary theory is an abstract entity that is unproblematically realized in different historical periods. He also assumes that Darwin conceived nature as if it were a Manchester spinning loom – a clanking, dispassionate machine. A more subtle analysis, which Ruse eschews, might discover that Darwin's conception of nature owed a strong debt to German Romanticism and that he contrived to infuse nature with moral and aesthetic values, not to suck them from nature. Ruse proves he is a thinker to contend with, and this essay is quite contentious.

Keywords: adaptation, altruism, Charles Darwin, design, evolutionary theory, mechanism, natural selection, purpose, Romanticism, Michael Ruse, teleology

Darwin fell into a swoon;
The garden died.
God pulled the Manchester loom
Out of his side.

After Yeats

Henri Bergson, writing to William James, remarked that every great philosopher has only one idea, which he explores and develops, now this way, now that. Michael Ruse's idea is that of Darwinian evolution, which, under various rubrics, has been the subject of his many books. His most recent reconfiguration of that idea is *Darwin and Design: Does Evolution Have a Purpose?* The book shows both the strength of his obsession and the constancy of his vision. It also further demonstrates the power of clear and vigorous prose in advancing such a vision.

Darwin and Design retraces much of the same history as two of Ruse's earlier books, *Monad to Man: the Concept of Progress in Evolutionary Biology* and *Mystery of Mysteries: Is Evolution a Social Construction?* *Monad to Man*, as its subtitle indicates, explores the idea of progress in the conceptions of evolutionary biologists from Lamarck and Erasmus Darwin to contemporary scientists. What was (and is) the role of progress in evolutionary theory? Is the notion of progress an essential part of the theory or a fellow traveler, dependent on the contingent attitudes of biologists at particular times? *Mystery of Mysteries* traverses the same general path, but here the question is the epistemological status of the theory of evolution. Have its foundations and claims been objectively established or have they been merely pretext for advancing deeper cultural and social values? In both of these books, Ruse argues a middle position. He regards progress and other cultural values as extrinsic to the ironclad science of the theory; but, like barnacles, they adhere to the vessel as it sails through advancing historical periods. He discovers them still clinging to contemporary versions of evolutionary systems.¹

Philosophers and historians often make assumptions and strike attitudes that chagrin members of the other group. When an individual like Ruse wears the paint of historian *and* philosopher, both tribes can stand aghast as the colors of the other seem to predominate – or when the paint simply seems to smear into a hostile provocation. One deep assumption runs through Ruse's books that historians, at least, would regard as an incitement to war. This is the notion that evolutionary theory is essentially one thing, one abstract system that is realized in different historical periods more or less intact. Some few philosophers, not of a Popperian demeanor, would also be ready to exorcise this macabre vision. The assumption allows Ruse to construe Darwinian theory as essentially constituted by natural selection – that is, selection as we would generally understand it today. Thus he presumes that the same abstract system stands behind both Darwin's conception and contemporary Neo-Darwinian versions, as if Darwin himself were a neo-Darwinian. This kind of assumption allows Ruse to regard the cultural values of a given period as distinct from the essential aspects of the evolutionary theory advanced during the period. It also implies that one can find the true followers of Darwin and separate them from the deviants, like Ernst Haeckel or even Thomas Henry Huxley, both of whom focused, in Ruse's estimation, too closely on morphology and not enough on natural selection.² This assumption suggests as well that when one argues, as I have, that Darwin was greatly influenced by ideas stemming from the German Romantic movement and that his theory displays

¹ Ruse, 1996, pp. 160–166.

² Ruse, 2003, pp. 131–135, 153.

strong strains of *Naturphilosophie* – well, that can seem totally absurd to one who presumes scientific theories to be nestled in a protected Platonic empyrean instead of crawling along as vulnerable historical creatures.

The historical pursuit in *Darwin and Design* makes the same assumption about the abstract and insulated character of theories, Darwin's in particular. Ruse concentrates on a singular problem in the history of biology, namely the apparently designed aspect of organism. Creatures display attributes that harmoniously cooperate in achieving certain ends, ultimately the well being of the individual and the perpetuation of the kind. Biologists have often understood the presence of traits that achieve particular ends – and the whole of which they are parts – as if they came into existence precisely to accomplish those ends. This happens less problematically with artifacts, say a watch, since the watchmaker has antecedently in mind a plan for the whole and designs the parts to achieve particular goals and so realize the general plan, namely, to tell time accurately. But what of natural organisms? Should we construe them as designed and does this mean there is intentional activity behind the design? Ruse follows out the answers that have been given these questions in clear and incisive descriptions, making a very complex history intelligible and accessible to a literate audience.

Teleology before Darwin

Ruse begins, appropriately enough, with Plato and Aristotle. Plato attributed the apparent design of creatures to a cause standing outside natural phenomena, to a demiurge that instilled order into potential chaos. The demiurge, though, may simply have been Plato's stand-in for the rational structuring of the universe. Aristotle, by contrast, placed the apparent design structure of organisms in a more comprehensive framework of internal, natural causes. The Aristotelian biologist might look to the matter out of which parts are made (e.g., flesh and bone), the agencies that produce the creature (e.g., blood and sperm) and set the parts in motion (e.g., a neural cord pulling on a bone), the formal structures of the parts and the whole (e.g., what intelligible relationships constitute them), and what purposes the parts are structured for and what goals guide the growth and development of the organism. This last kind of cause, the final cause, has turned out to be the most problematic and interesting. Both Plato and Aristotle conceived the ordering of the world as rational and intelligible, which to medieval philosophers bespoke a design and a Divine designer. Aquinas argued that the obvious rational patterns exhibited by the world could only be explained by an omnipotent world-maker. Ruse limns this ancient and medieval history with broad but illuminating strokes. He then jumps to discuss Hume's corrosive

analysis of the argument from design. In these brief historical sketches, he ignores the mountains of scholarship that lie under the history he efficiently recounts. His own goal is to set the problem with which Darwin had to deal, and his brief historical sketches serve that purpose.

Ruse lingers, quite properly, a bit longer over the considerations of William Paley, William Whewell, and Immanuel Kant. Paley delighted Darwin in his student years with the logic of an argument that vaulted from the intricacies of the eye to the craft of the master eye-maker. And Whewell's *History of the Experimental Sciences* served as a constant reference for the young naturalist. Kant, though, had no direct impact on Darwin's conceptions. But Ruse rightly – if lightly – expends some time on the notion of teleology in the third *Critique*, since that notion had seeped into British natural science, not the least in the writings of Whewell. Moreover, Kant developed a quite profound analysis of the concept of organization in biology that is interesting in its own right and historically quite influential. And Ruse's own construction has a deep Kantian tinge.

Kant argued that proper science – which establishes its laws with universality and necessity – must depend only on mechanistic causality, that is, the sort of causality in which a complex arrangement is explicable by reason of the interaction of parts. This is the kind of causality characteristic of Newtonian mechanics and is ultimately grounded, according to the Kant of the first *Critique*, in the fundamental categories of experience. The biological researcher when attempting to understand, for example, the operations of the vertebrate eye must, therefore, construe the path of light rays entering the eye through the application of mechanical principle, for example, Snell's law. Yet, according to Kant, there will be a residual feature that simply resists mechanistic interpretation, in this case the arrangement of the various media of the eye (e.g., cornea, humors, lens, retina). Empirical investigation suggests that the organization of these parts serves a purpose, namely to focus an image on the retina. It's as if the parts were designed to serve that end – at least, we seem unable to understand their arrangement except as the causal product of the very idea or plan of the whole. Mechanistic analysis only leads the biologist so far, but finally he must resort to the attribution of “natural purposes.” If we had the discernment of angels, we might be able to reconcile the notions of mechanism and purpose; but in our human state, we must forgo the possibility that some Newton of the grass blade might arise.³ Thus, though the naturalist is compelled to assume that organic systems come into existence through the agency of a design and a designing intelligence, this assumption can only serve, according to Kant, *als ob*. It's an “as if” regulatory idea, a methodological heuristic that can never become a determinatively fixed law of nature. At best, such regulatory ideas might lead us to some

³ Kant, 1957, 5: 517 (A334, B338).

further mechanistic principles that could be applied to biological organisms; but an ultimate resolution of purpose into mechanism seems beyond human possibility. Hence, in Kant's estimation, biology can never really be a science (*Naturwissenschaft*), only a loose set of generalizations (*Naturlehre*) with an admixture of mechanical principles.

The crux of Kant's doctrine is that design implies an intelligence, and thus there seems no possibility of a naturalistic or mechanistic account of the agency producing distinctively organic traits. Hence, the need for an assumption of a non-natural source for teleologically structured creatures; but that very assumption renders the discipline of biology beyond the pale of authentic science.

Ruse remarks an interesting feature of Kant's theory of the organism. Kant considered the possibility of a transmutation of species over time. He observed that by small modifications of this structure or that, say in the vertebrate archetype, one could transform one species into another. When Kant's former student Johann Gottlieb Herder advanced transformational notions in the 1780s, Kant found them "ideas so monstrous that reason shudders before them."⁴ In the third *Critique*, however, under the influence of Blumenbach, he conceded that it was theoretically possible for such transformation to occur – as long as one didn't assume that the organic could arise from the inorganic (as Herder had implied). Yet Kant thought this "daring adventure of reason" lacked empirical evidence, and so rejected it.⁵ A bit later, Goethe and his disciple Friedrich Schelling would undertake just this adventure, a ground-breaking event that Darwin himself recognized as setting the priority for evolutionary ideas.⁶ It's too bad Ruse does not investigate the work of Goethe – aside from the random sentence. The poet not only set out on an evolutionary path but also originated the science of morphology, which became fundamental to the conceptions of Alexander von Humboldt and Richard Owen, both of whom Darwin assiduously read and absorbed. William Whewell also credits Goethe with developing the morphological conception of the unity of type. Darwin read these passages in Whewell with sharpened pencil in hand.⁷

⁴ *Ibid.*, 6: 792 (A22).

⁵ *Ibid.*, 5: 538–539 (A363–365, 8368–370). I have discussed Kant's position in Richards, 2002, chap. 5.

⁶ In the third edition of the *Origin*, Darwin mentions the priority of Lamarck, his grandfather Erasmus Darwin, and Goethe in establishing the fundamental idea of transformation of species over time. Haeckel suggested this priority to Darwin, as did Isidore Geoffroy St.-Hilaire. See Peckham, 1959, p. 61.

⁷ Darwin left extensive notes in the margins of his copy of Whewell's *History of the Inductive Sciences*, most heavily in those chapters on morphology and unity of type. See Di Gregorio, 1990, p. 868.

Ruse's Darwin

Ruse's understanding of Darwin's accomplishment is the hinge for all the subsequent scenes in his portrayal of the fate of design in modern biology. He begins his chapters on Darwin by noting that some scholars agree with Asa Gray that Darwin united morphology and teleology in his theory, while others (e.g., Michael Ghiselin) contend that teleology was utterly banished from Darwin's thinking. In discussing this question, Ruse only lightly explores Darwin's notebooks, letters, and published texts. Hermeneutical analysis is not his strong suite. He rather attempts to think through the issues as he imagines Darwin would have and writes as if he had just received the straight account in a series of emails from the other side.

Ruse's argument is the simple but compelling one, namely, that Darwin, like virtually every biologist of the period, understood the parts of organisms as purposeful. Organic traits, in this sense, were adapted to their ends as if the creator had immediately taken a hand in their design: "the organism-as-if-it-were-designed-by God picture was absolutely central to Darwin's thinking in 1862, as it always had been."⁸ For both Kant and Darwin, organisms *appeared* as if they were designed; though neither thinker would allow a direct scientific inference to a divine cause of design. The crucial difference between the two on this question is that Kant left the purposefulness of organisms as essentially inexplicable by appeal to natural causes, whereas Darwin employed natural selection to impart the adaptations that organisms displayed. Though, as Ruse notes, even Darwin could not quite bring himself to suppose that the universe was ruled only by chance and necessity. Up to the writing of the *Origin*, Darwin, in Ruse's estimation, "became an evolutionist as much because of his religious beliefs as despite them."⁹ Yet Darwin was foursquare for the mechanistic causality imposed by natural selection. What Darwin accomplished, as Ruse sums it up, was that "he showed how to get purpose without directly invoking a designer – natural selection gets things done according to blind law without making direct mention of mind. The teleology is internal."¹⁰ I think Ruse's analysis does sketch the surface of Darwin's thought, but deeper forces run below that thought, giving it more intricate contours than modern orthodoxy recognizes.

⁸ Ruse, 2003, p. 122.

⁹ *Ibid.*, p. 124.

¹⁰ *Ibid.*, p. 126.

Darwin as Romantic

While on the *Beagle* voyage, Darwin read and reread Alexander von Humboldt's *Personal Narrative of Travels to the Equinoctial Regions of the New Continent*, a multi-volume depiction of the travels of Humboldt and Aimé Bonpland during the years 1799–1804.¹¹ The volumes exude the Romantic élan that the young German adventurer acquired during his close relationship with Goethe. In the book and in other of Humboldt's texts that Darwin absorbed during the isolation of his voyage, the aesthetic and moral values of nature are spread on every page. Those values did not derive from a personal God, but from the very vital forces of nature herself. Darwin's *Diary*, which he kept during the voyage, displays in virtually every entry traces of the moral and aesthetic ideas of Humboldt; and those ideas became the sensitive organs by which the young Englishman viewed nature. On the trip home, Darwin himself reflected on the ways he had come to perceive nature through German eyes: "As the force of impression frequently depends on preconceived ideas, I may add that all mine were taken from the vivid descriptions in the *Personal Narrative* which far exceed in merit anything I have ever read on the subject."¹² The nature referred to in Humboldt's book and Darwin's own *Journal of Researches of the Voyage of the Beagle* was not a static, mechanically contrived nature, but a nature vitally alive with forces of creation and steeped in aesthetic and moral values.

Humboldt's Romantic conception of nature continued to be re-emphasized for Darwin in the literature that he read after his return to England. So, for instance, in spring of 1838, he reflected on the recently translated essay by Carl Gustav Carus, Goethe's disciple: "After reading 'Carus on the Kingdoms of Nature, their life & affinity' in *Scientific Memoirs* I can see that perfection may be talked of with respect to life generally. – where 'unity constantly develops multiplicity' (his definition 'constant manifestation of unity through multiplicity') this unity, this distinctness of laws from rest of universe which Carus considers big animal becomes more developed in higher animals than in vegetables."¹³ Later in his *Notebook C*, Darwin further considered Carus's view of nature, which was essentially Humboldt's as well. He jotted in his notebook: "There is one living spirit, prevalent over this world [sic, world] (subject to certain contingencies of organic matter & chiefly heat), which assumes a multitude of forms each having acting principle according to subordinate laws."¹⁴ The idea of an underlying unity to nature

¹¹ von Humboldt and Bonpland, 1818–1829.

¹² Keynes, 1988, p. 443. These remarks were reprinted in Darwin, 1839, p. 604.

¹³ Darwin, 1836–1844, in Paul Barrett, 1987, pp. 269–270.

¹⁴ *Ibid.*, p. 305 (MS 210e). Phillip Sloan, who shares my view that many Romantic strains can be heard playing through the *Origin*, has focused in particular on the impact of Carus and

that makes intelligible relationships among apparently disparate creatures – an idea fueling the theory of the archetype – would become, of course, a grounding assumption of Darwin’s evolutionary scheme.

The theory of the archetype, which derived from Schelling and Goethe and passed through Richard Owen, became in Darwin’s hands a historicized entity and one absolutely crucial to his theory of evolution. The penultimate chapter of the *Origin* on unity of type is simply a further development of this Romantic conception.

These Romantic ideas came to shape, I believe, the nature found in the *Origin of Species*. The creative agency of that nature, as Darwin gradually construed it, is natural selection. And even Ruse recognizes that natural selection has a *creative* role in Darwin’s scheme; but it’s not the role of a *machine* – a term, in all of its forms, that appears only once in the *Origin of Species*. In the 1840s, when Darwin was attempting to formulate for himself the character of natural selection, he employed a potent metaphor. He likened the operations of selection to an all powerful being:

Let us now suppose a Being with penetration sufficient to perceive differences in the outer and innermost organization quite imperceptible to man, and with forethought extending over future centuries to which with unerring care and select for any object the offspring of an organism produced under the foregoing circumstances; I can see no conceivable reason why he should not form a new race (or several were he to separate the stock of the original organism and work on several islands) adapted to new ends. As we assume his discrimination, and his forethought, and his steadiness of object, to be incomparably greater than those qualities in man, so we may suppose the beauty and complications of the adaptations of the new race and their differences from the original stock to be greater than in the domestic races produced by man’s agency.¹⁵

Here Darwin, through a telling trope, worked out for himself the character of the operations of natural selection: it acted with “forethought,” designing adaptations, not simply of utility, but of aesthetic beauty. When this same creature made its appearance in the *Origin of Species* fifteen years later, it shed some of its garb, but none of its deep vitality and moral temper:

Man can act only on external and visible characters: nature cares nothing for appearances, except in so far as they may be useful to any being. She can act on every internal organ, on every shade of constitutional difference, on the whole machinery of life. Man selects only for his own good;

Humboldt on Darwin’s conception of nature. See his detailed though succinct presentation in Sloan, 2001, pp. 251–269.

¹⁵ Darwin, 1909, p. 85.

Nature only for that of the being which she tends. . . . It may be said that natural selection is daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working whenever and wherever opportunity offers, as the improvements of each organic being in relation to its organic and inorganic conditions of life.¹⁶

Through means of a literary device, an aesthetic instrument, Darwin infused his conception of nature with “the stamp of far higher workmanship” than any human contrivance. Natural selection, in Darwin’s image-driven language, displays patently the attribute denied in Ruse’s representation of Darwin’s theory, namely that of intelligence. Nature hardly operates like a clattering and wheezing Manchester mechanical loom, rather like a subtle and refined mind that can direct development in an altruistic and progressive way: “as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress toward perfection,” says Darwin in the *Origin*.¹⁷ And he avers that the goal, the teleological end of such development, drawn even from the lower depths of destruction, would be the production of higher, more perfect creatures: “Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely the production of the higher animals directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed laws of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved.”¹⁸ Darwin’s conclusion about the progressive goal of evolution is dressed in poetic language, but certainly is no less intended for that. He honed this passage, beginning with its incipient form in his essay of 1842, and continued to refine it right through the sixth and final edition of the *Origin* in 1872.

Alfred Russel Wallace cautioned Darwin that the metaphorical character of the term “natural selection” would mislead many readers and would not convey the right causal structure of the device. Wallace recommended Spencer’s version, namely “survival of the fittest,” as a substitute for the description “natural selection.”¹⁹ In the last two editions of the *Origin*, Darwin did offer Spencer’s appellation in tandem with his own, but he declined to replace his original expression. He told Wallace that his initial

¹⁶ Darwin, 1859, pp. 83–84.

¹⁷ *Ibid.*, p. 489.

¹⁸ *Ibid.*, p. 490.

¹⁹ Alfred Russel Wallace to Charles Darwin (2 July 1866), in Marchant, 1916, 1: 170–174.

way of articulating the cause of species alteration was embedded in the general theory.²⁰ Spencer had proposed his rendition to emphasize that selection was only the “elimination” of the unfit. It was not creative but destructive. Moreover, he wished to indicate by his version that greater fecundity rather than superior attributes might win the day in the struggle for existence; improved or progressive traits per se would not necessarily succeed. Darwin, by contrast, understood natural selection as creative and progressive. Today, most biologists are ready to embrace Spencer’s way of looking at this critical cause of species change. They, like Ruse, remain unaware of the crucial differences separating the contemporary understanding of selection and that of Darwin.

The real theory of the *Origin of Species* is conveyed, I believe, in the book itself and in the essays and notes upon which it is based, not in some abstract system that floats over the historical period of the book’s composition. When the historical theory is viewed with eyes not besotted with contemporary neo-Darwinian notions, it will be seen as advancing the conception of a nature that has distinctive mental characteristics. In Darwin’s scheme it is hardly *mere* metaphor to say that nature has designed her creatures for certain ends. And this is a view of nature that many of the German Romantics would have endorsed – and one Romantic contemporary of Darwin certainly did, namely Ernst Haeckel.

To regard Darwin as a Romantic biologist is to set him against a conceptual and psychological milieu that has been almost completely ignored in the vast literature that has accumulated around this paragon of the modern temper. Darwin, like any thinker of comparable genius in the history of science, escapes the simple classifications that would take his measure. He was sensitive to a multitude of conceptual, social, and personal forces, and they shifted his thought in ways that become obscured by the often routinized ideas of historians. Lest the reader think, however, that I have also failed to appreciate the range of powers that gave shape to Darwin’s theory, let me offer the caveat that concludes the analysis in my book *The Romantic Conception of Life*: “Darwin’s early attitudes about nature obviously became subject to conceptual influences other than those of the German Romantics – he was not simply, after all, Werther in his blue frock coat and yellow vest, reading his Homer and suffering unrequited love, albeit in a jungle clearing. But neither was he that unflinching mechanist who deprived nature of her soul of loveliness.”²¹

²⁰ Charles Darwin to Alfred Russel Wallace (5 July 1866), in *ibid.*, pp. 174–176.

²¹ Richards, 2002, p. 554.

The Problem of Design in Recent Evolutionary Conceptions

The red thread that guides Ruse in his portrayal of evolutionary thought in the period after Darwin is his conception of the Englishman's theory as an abstract entity that has natural selection as its essential feature. This allows him to dismiss as unauthentically Darwinian many kinds of evolutionary schemes that have certainly taken their rise from Darwin's *Origin of Species* – so, for instance, those evolutionary theories that allow for group selection. Ruse's neo-Darwinian conception of selection is such that he assumes Darwin simply dismissed group selection. But this is not true. In the seventh chapter of the *Origin*, Darwin introduces “community selection” to explain the wonderful instincts of the social insects. This kind of selection operates, he argues, on the whole hive of related individuals. And Darwin generalizes this notion in the *Descent of Man* to explain human altruistic behavior. Now Ruse understands this, but supposes that as soon as Darwin mentions community selection on human groups, he “reverts to an individualistic stance, suggesting what today is known as reciprocal altruism.”²² But in the *Descent*, Darwin doesn't revert to reciprocal altruism, which he calls a “low motive.”²³ He rather regards acts done for reciprocal benefit or the blandishments of praise and blame as instances of selfish behavior and thus as unfit to be taken as authentically moral. Indeed, he holds that by his moral theory “the reproach of laying the foundation of the most noble part of our nature in the base principle of selfishness is removed.”²⁴ That noble feature of our nature – the altruistic impulse – is instilled by group selection:

It must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual man and his children over the other men of the same tribe, yet an advancement in the standard of morality and an increase in the number of well-endowed men will certainly give an immense advantage to one tribe over another. There can be no doubt that a tribe including many members who, from possessing in a high degree the spirit of patriotism, fidelity, obedience, courage, and sympathy, were always ready to give aid to each other and to sacrifice themselves for the common good, would be victorious over most other tribes; and this would be natural selection.²⁵

²² Ruse, 2003, p. 211.

²³ Darwin, 1871, 1: 163.

²⁴ *Ibid.*, p. 98.

²⁵ *Ibid.*, p. 166. See also *ibid.* pp. 82, 84, 155, 157, and 2: 391 for other expressions of the group selection model for explaining the moral instincts.

After Darwin had formulated this idea of community selection in the *Descent* – to be sure, a generalization of his theory of selection in the social insects – he then reintroduced the idea to the *Origin of Species* in the last two editions, where it is perfectly clear that the community need not have its members all related (as would be the case if this were an example of kin-selection as we now understand it). Darwin wrote in the final edition of the *Origin*: “In social animals it [natural selection] will adapt the structure of each individual for the benefit of the whole community; if the community profits by the selected change.”²⁶ This is exactly the kind of selection characteristic of some mid-twentieth century versions of evolution (e.g., that of Wynn-Edwards) but rejected by George Williams in his classic, Neo-Darwinian study of natural selection and adaptation.²⁷ And it’s the kind of selection Ruse denies of Darwin as well. Darwin may well have been wrong about the explanation for human altruism and for behaviors of other social animals, but I think there can be little doubt concerning his endorsement of group selection.

Ruse also finds something unauthentic about evolutionary theories that focus on morphology and the phylogenetic descent of species. He somehow thinks that a morphological interest derails a naturalist’s belief in a selective explanation of adaptations. For Darwin, according to Ruse, “the big biological problem is adaptation,” which natural selection was designed to explain.²⁸ But “Huxley was indifferent to adaptation,” and in Haeckel’s hands “evolution became a second-rate Germanized tracing of phylogenies.”²⁹ Ruse’s narrow reading notwithstanding, we know that Darwin was keenly interested in morphology and phylogenetic relationships – his four large Barnacle books are exclusively about these topics; and the evidence drawn from his morphological research (including systematic phylogenies and embryological patterns as elaborated in chapters two, four, and thirteen of the *Origin*) provided him empirical grounds for his argument. Even such stalwarts as Sewall Wright and Theodosius Dobzhansky – since natural selection did not play a dominate role in their conceptions – even these architects of the modern synthesis were, in Ruse’s judgment, “not very Darwinian.”³⁰ I think by the standards that Ruse sets, not even Darwin was very Darwinian.

Ruse concludes his book with some strong and telling objections to those advocating what is now called “intelligent design.” This religious response to evolutionary theories is really a regression to nineteenth century objections to Darwin, mostly based on the idea that multiply dependent traits could not

²⁶ Peckham, 1959, p. 172.

²⁷ Williams, 1966, pp. 92–124.

²⁸ Ruse, 2003, p. 167.

²⁹ *Ibid.*, pp. 146 and 153.

³⁰ *Ibid.*, pp. 165–167.

come into existence simultaneously, except by the providential power of a supreme intelligence – obviously God, to whom these modern-day natural theologians like to refer without the use of last names.

The real conclusion of Ruse's book actually comes several chapters before the last, when he sums up his argument: "Now that things have been spelled out, we see that there is nothing very mysterious about purpose in evolution. At the heart of modern evolutionary biology is the metaphor of design, and for this reason function-talk is appropriate. Organisms give the appearance of being designed, and thanks to Charles Darwin's discovery of natural selection we know why this is true."³¹ Ruse thus resolves the problem of design in a way reminiscent of Kant's solution. Biologists quite routinely refer to the design of organisms and their traits, but properly speaking it's *apparent* design to which they refer – an "as if" design. Design-talk, Ruse concludes, must be regarded as metaphorical. Hence, neither the scientist nor the religiously minded para-scientist can validly infer from apparent design to a real designer. In scientific terms, design has to be cashed out as function, which is validly explained by the mechanism of natural selection.

Ultimately Ruse fails to take the role of metaphor and other aesthetic devices in science seriously. He assumes that they can be eliminated while leaving theory intact. He simply does not see how these modes of expression could have structured Darwin's conception of nature and the operations of selection in the first place. Darwin's metaphor of the intelligent and morally acute selector has, I believe, given nature a pulse that beats to ethical and aesthetic values. It has rendered, in Darwin's perception, alterations in nature more gradual and fine than could be produced by any human hand. It has led to the progressive development of creatures, with the ultimate goal of producing higher animals. Had Darwin conceived natural selection as mere mechanism, none of the aforementioned traits would have been accorded to nature. To comprehend the function of metaphor and trope in Darwin's theory does, of course, require a certain level of awareness, a Romantic sensitivity, perhaps. But then, if one's sensibilities have been deep frozen after years of suffering Canadian winters and now pressure cooked during the steamy summers of Florida, they may simply have been hardened into a bully lump.

Despite my reservations about certain aspects of Ruse's version of Darwin, I am ready to acknowledge the virtues of a scholar who writes with force and British common-sense, one who has given us a history of evolutionary ideas that brings out their contours in bold relief, one who presents clear arguments and strong conclusions. This is thought to reckon with. My differences with Michael Ruse, which have weathered over many years now, bear some resemblance to the long-standing disputes between Malthus and Ricardo in

³¹ Ibid., p. 273.

the early nineteenth century. At least my own feelings approach those of Ricardo, who, just before his untimely death, left off in a letter to his friend with this envoi: “And now my dear Malthus I have done. Like other disputants after much discussion we each retain our own opinions. These discussions however never influence our friendship: I should not like you more than I do if you agreed in opinion with me.”³²

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³² Cited by my one-time colleague George Stigler, 1988 [2003], pp. 210–211.