

THE ROMANTIC CONCEPTION OF ROBERT J. RICHARDS

Abstract: In his new book, *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe*, Robert J Richards argues that Charles Darwin's true evolutionary roots lie in the German Romantic biology that flourished around the beginning of the nineteenth century. It is argued that Richards is quite wrong in this claim and that Darwin's roots are in the British society within which he was born, educated, and lived.

Key words: Charles Darwin, German evolutionary thought, Goethe, Robert J Richards, Romantic biology.

It is remarkable how Darwin recognizes among beasts and plants his English society with its division of labour, competition, opening up of new markets, 'inventions,' and the Malthusian 'struggle for existence.' (Letter from Karl Marx to Friedrich Engels, June 18, 1862.)

Robert J Richards is today's most brilliant, creative, and stimulating historian of evolutionary biology. His Pfizer Prize-winning

book, *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior*, was an incredible *tour de force*, taking us from the eighteenth to the twentieth centuries, packed with insights and backed by the most solid scholarship. His *The Meaning of Evolution: The Morphological Construction and Ideological Reconstruction of Darwin's Theory* was spritely and provocative, and where one disagreed one nevertheless learnt. Now we have his *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe*, and here he uncovers material about German thought and its relationship to biology that is as obviously vital as it was previously unknown. His treatment of Goethe on evolution not only challenges all that went before but sets the base for all future research. But Richards is too good a historian simply to invite adoration and praise – let us leave that until he is dead. Here rather I intend to engage him on one of the most controversial and (if established) important claims that his researches have led him to make. I argue that, like the titanotherium of old with its baroque nasal appendages, what started out as sensible and functional has ended in a form that properly belongs in a cartoon by Gary Larson.

The issue is that of Charles Darwin and the way in which his achievements should be regarded. Richards wants to argue that

Darwin and his theory of evolution was Germanized through and through, and that once this is seen then we have (for the first time) a full and proper appreciation of that great revolution in the middle of the nineteenth century. I argue that Richards is completely and utterly wrong in this, and that the traditional interpretation (from Karl Marx on) that sees Darwin as the quintessential Englishman is the better understanding of the man and his work. To set the scene, I give first what I trust is a full and fair exposition of Richards's position. Then I give the traditional position – or rather, because I do not want to hide behind others, I give my position, confident that even if not all would agree with every detail most would agree with the basic picture. Finally, I compare and contrast, trying to see who has the better case.

Darwin the Romantic

Robert Richards's view of Darwin is not entirely new to this recent book. He has been working up to this for some time, now. But it is on the new book, which has a detailed *Epilogue* on Darwin, that I shall concentrate here. The idea is simple. Charles Darwin was a Romantic. It was this philosophy that guided him and molded his vital theory of evolution.

The venerable Darwin, who peers out from John Collier's posthumous portrait, done in 1884, has the visage of a terrible Old Testament prophet. Photographs taken during his last years confirm that the artifice embraced the man, not merely the painting. These are the images of Darwin we remember most vividly – hardly the kind of figure one would think of as a Romantic revolutionary. Yet, that he was a revolutionary, there can be no doubt. Nor, I believe, can we deny, at least when the written evidence is carefully considered, the deep Romantic strains of his thought.

What does it mean to speak of Darwin as a Romantic? First and foremost, it is an attitude to nature. The world, organic and inorganic, is not dead or lifeless – it pulsates throughout with being, with becoming, with bursting, living energy. It is like a supra-organism, with everything part of a whole, with all being directed to the same end, with meaning, with life. The favourite philosopher of the Romantic is the Dutch lens-grinder, Baruch Spinoza, who may have been expelled from his synagogue but who was nevertheless the most religious of men, being a kind of pantheist, seeing the whole of being as one, as a manifestation of the deity. *Deus sive natura* – God or Nature.

Because the world is one living being, we expect to find connections and deep harmonies. The world is going to show repeated patterns as all is founded on underlying ideas and manifests them in its specific being. For the Romantic, it is isomorphism – homology – that is the key feature of the living and non-living (as we might term them), rather than any utilitarian design. Connected with this will be a kind of upward thrust to life, a progressive reaching to the top. For this reason, life is going to be deeply developmental – physically evolutionary in the opinion of many – with humans at the peak. In a way, the actual causes of change are less than pressing, for there is a kind of teleology about everything that takes one upwards. The development of the individual is a cameo for the development of life, with deep parallels between the ontogeny of the developing organism and the history of the developing line of organisms, whether this latter be interpreted in terms of physical continuity or not.

The picture we are dealing with is deeply anti-reductionistic. The whole idea of life as a mechanism or as a machine is alien to this way of thinking. To believe that you can capture the nature of anything – particularly an organism – by breaking it down into its parts is false and misleading. One must adopt what the twentieth-century, South

African statesman Jan Smuts was to call a "holistic" view of life. To remove one part is to destroy the whole. Save one consider things in relation to other things, one will fail entirely to capture the essence of being, particularly the essence of the living being. Humans must be seen as the top of the ladder of being. All thrusts upwardly to us and it is we who are the ultimate manifestation of holistic existence.

Human nature is essentially social, but more than this – social in a way that commits one to deep interpersonal connections. Humans alone – humans as Robinson Crusoe – are not truly human. It is in our relationships that we become truly what we are. Hence, to understand someone's position or claims, we must understand not just the formal claims but the background – the history that led up to the position or claims and the personality of the individual making the claims.

For Richards, Darwin is the epitome of this philosophy, partly through self-teaching and experiences – notably the time on the *Beagle* – but also through the reading that he did constantly, and especially the reading (and personal influence) of Romantic thinkers, most importantly the traveler and scientist Alexander von Humboldt. Secondary influences included most particularly the English anatomist Richard Owen.

Darwin came by his attitudes much as the earlier German Romantics had, through prolonged contact with exotic nature – but nature as filtered through a certain literature. In Darwin’s case, the literature was singularly provided by the conceptually and aesthetically lush works of Alexander von Humboldt, who taught him how to experience the sublime and how morally to evaluate the nature he met in the jungles, mountains, and plains of South America. That early experience, formed and shaped under the guiding images provided by Humboldt, settled deeply into the conceptual structure of the *Origin of Species* and the *Descent of Man*. The sensitive reader of Darwin’s works, a reader not already completely bent to early-twenty-first-century evolutionary constructions, will feel the difference between the nature that Darwin describes and the morally effete nature of modern theory.

What evidence do we have for all of this? Most obviously, there is the explicitly admitted influence of von Humboldt. Darwin refers to him with praise in the *Autobiography*, he was inspired by von Humboldt to go traveling, and then (and forever) Darwin saw the world through the spectacles of the older man. The world is seen as a living thing, with all connected to everything else. Nature itself is

living, a being of intrinsic value. No one would deny this of the travel book that Darwin wrote, the *Voyage of the Beagle*. The language is modeled consciously on von Humboldt's own writings about nature. But Richards argues that we find just this kind of Romantic writing in the *Origin*. Bringing in the poet John Milton – “that favorite of both the German and English romantics” – who found a solution to the problem of evil through the end result of good and the working of all to higher beings, Richards quotes those famous words of the final sentences of Darwin's greatest work.

It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent upon each other, in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction... a Rate of Increase so high as to lead to a Struggle for Life, and as a consequence Natural Selection entailing, a Divergence of Character and the extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object 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 law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been and are being, evolved.

To which Richards adds: "O felix culpa! Or rather, O felix natura! — nature, that thoroughly organic being, which embodies aesthetic and moral values."

But there is more. In Darwin's thinking there is a complete downplaying of mechanistic and other machine-like metaphors, and a pushing of nature as itself throbbing with life, moving ever upwards. Selection is no lifeless mechanical force, but the god of the Romantics — nature itself working to its desired end. Richards quotes the *Origin*.

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; Nature only for 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, at the improvement of each organic being in relation to its organic and inorganic conditions of life.

About this and like passages Richards writes:

These passages, which describe natural selection as peering into the very fabric of a creature, selecting altruistically that which is good and casting out what is bad, a natural selection that operates perfectly (as the earliest manuscript has it) – these passages hardly describe the operations of Locke’s spinning jenny [James Hargreaves, actually] or even the clatter and wheeze of a Manchester mechanical loom.

Then shortly after, Richards writes:

Darwin’s imaginative construction of natural selection exemplifies his early notions about the role of poetic fancy in science – a notion quite in conformity to that of the Romantics.

He came to believe, likely from reading Humboldt and also Wordsworth, that fabricating “castles in the air” must set the path for more rigidly analytic thought about a subject. Such fancy, he believed, was no less difficult than “the closest train of geological thought”; and, indeed, he judged that the capacity for imaginative constructions “makes a discoverer.” His own employment of such “castles in the air” not only aided him in the discovery of natural selection, but also deeply structured that discovery.

Homology is fundamental to Darwin, as it was to the Romantics. As is also the connection between the upward thrust of life and of the individual organism. And make no mistake. There is a strong parallel here, between the history of life and the history of the individual, with the latter recapitulating the adult forms that we see in the past. Richard Owen had tried to spell out the notion of archetype to explain homology, with each branch (corresponding to the four embrachements of Cuvier) having its own basic form – a form that was then molded to individual use in particular species. Of this Richards writes:

As an instance of the molding force exercised by archetype

theory on the deep structure of the *Origin*, one might point to Darwin's chronic presumption that the transformation of species occurred without common descent. In his "Essay of 1844," for example, he assumed that evolution would occur within the archetypes of, say, the articulata, radiata, mollusca, and vertebrata, but allowed that no common ancestor would be found for these branches of the animal kingdom. He thus concluded for the animal and plant kingdoms, "all the organisms yet discovered are descendants of probably less than ten parent forms." In the *Origin*, Darwin advanced this same conviction that "animals have descended from at most only four or five progenitors, and plants from an equal or lesser number." This hypothesis, he maintained, was sufficient for his general theory. He did venture, however, that analogy suggested that "probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed."

Finally, there is the matter of humans, firmly at the top of the heap, as one would expect in a Romantic conception of life. Most interesting and significant is Darwin's treatment of morality and our ethical sense. He is repelled by harsh utilitarian calculations of right

and wrong, putting all down to consequences. He is much more inclined to a general moral sense, a feeling of sympathy with our fellow humans. He is much opposed to the utilitarians trying to relate morality to self interest, a form of selfishness. To the contrary, Darwin thinks that through culture we have escaped some of our biology – praise and blame as motivating factors are important here – but underlying all is (what today we would call) a kind of group selection. A problem first worked on when he was thinking about social insects, it becomes very important by the time that Darwin gets to the *Descent*. Humans help each other in the group and this help, spurred by a sense of altruism or feeling that we ought to help each other, gets preserved by selection and passed on down through the generations.

Darwin conjectured that our ancestors lived in small tribal communities that would compete with one another, not unlike groups of social insect hives. Those communities would reap the propagative advantages if some members exhibited altruistic impulses that directed their behaviour to the welfare of the whole. And over generations, he believed, this process would further inculcate altruism in successful tribal communities. During the course of ages, intellectual acquisitions, learned customs, and advances in knowledge that a group might enjoy would focus the altruistic instincts of members on actions that

would be ever more efficient in producing real benefit for others (for instance, the discovery of the value of inoculation)...

The utilitarians, Darwin observed, had claimed that "the foundation of morality lay in a form of Selfishness; but more recently in the 'Greatest Happiness principle.'" His own theory, by contrast, did not suppose that moral action was motivated by self-interest or executed to achieve the greatest happiness. Rather, human beings, he maintained, acted spontaneously, impelled by their altruistic instincts, to advance the welfare of others without counting the cost to self.

Darwin the Middle-Class Englishman

What is the alternative standard position? It would not be one that set out to deny Richards entirely. Darwin was a man who felt very many influences and whose genius came in responding to so many and in building a picture rather like that produced by a kaleidoscope – where the many parts go together to make something entirely new. There are Romantic elements in Darwin's thinking. But – and it is a big but – there are many other elements in Darwin's thinking, French and British, and overall it is the British elements that

make for Darwin's real achievements. Darwin's is the paradigmatic British scientific theory. To see this, it is convenient to divide Darwin's achievements into two. First, there is the move to evolution as such, or evolution as fact, that is to the idea that all organisms come by a natural (that is, law-bound, non-miraculous) process of development from just a very few, perhaps one, forms. Second, there is the mechanism or cause of evolution, in Darwin's case of natural selection brought on by a struggle for existence. Let us take them in turn.

Darwin traveled on *HMS Beagle* from the end of 1831 until the fall of 1836. He certainly knew all about evolution (as fact) before he went away. He had dipped into his grandfather's evolutionary work *Zoonomia* and when at Edinburgh had mixed with the evolutionary anatomist Robert Grant. He also got lots of anti-evolutionary propaganda from the likes of Henslow, Sedgwick, and Whewell, when an undergraduate at Cambridge. He was not then an evolutionist and was apparently fairly literal in his reading of the Bible. He was a convinced Anglican. On the *Beagle* voyage he learnt more about evolution through his reading of the second volume of Lyell's principles, a work that not only gave a detailed exposition of Lamarck's evolutionary theory, but (incorrectly) presented Lamarck as trying to explain a progressive fossil record. A work also that suggested

strongly that the origins of organisms are natural but that fudged the exact causes. Theologically, Darwin moved from Christianity and theism to a kind of deism – God as unmoved mover – a belief that stayed with him right through the writing and publication of the *Origin*. (After that, particularly under the influence of Huxley, he moved to agnosticism, with occasional flashes of belief.) On the *Beagle* voyage, Darwin did not become an evolutionist, but some physical facts did disturb him, notably the distribution of the birds and reptiles on the Galapagos Archipelago. On return to England, he did become an evolutionist in the spring of 1837, most probably when he learnt definitively that the Galapagos organisms were different species. The influence of others, most particularly his new chum Richard Owen, cannot be discounted.

Now what is really driving Darwin in all of this? First, most obviously, he learns about evolutionary ideas. From where? From grandfather Erasmus, from Robert Grant, from Lamarck filtered through the Scots-born, English-educated Charles Lyell. Then there is the all-crucial move to deism. Although Darwin was raised as an Anglican theist, there was lots of deism all around him. Erasmus Darwin for a start, a man who linked his religious beliefs explicitly with his belief in an upward evolutionary process.

Organic Life beneath the shoreless waves
Was born and nurs'd in Ocean's pearly caves;
First forms minute, unseen by spheric glass,
Move on the mud, or pierce the watery mass;
These, as successive generations bloom,
New powers acquire, and larger limbs assume;
Whence countless groups of vegetation spring,
And breathing realms of fin, and feet, and wing.

Thus the tall Oak, the giant of the wood,
Which bears Britannia's thunders on the flood;
The Whale, unmeasured monster of the main,
The lordly Lion, monarch of the plain,
The Eagle soaring in the realms of air,
Whose eye undazzled drinks the solar glare,
Imperious man, who rules the bestial crowd,
Of language, reason, and reflection proud,
With brow erect who scorns this earthy sod,
And styles himself the image of his God;
Arose from rudiments of form and sense,
An embryon point, or microscopic ens!

Evolution, the triumph of unbroken law, is the apotheosis of God's standing and worth. Everything is planned beforehand and goes into effect through the laws of nature. "What a magnificent idea of the infinite power of *The Great Architect! The Cause of Causes! Parent of Parents! Ens Entium!*"

Then there is the Lyellian influence, a major factor on Darwin's development as a scientist. He becomes an ardent Lyellian geologist, totally committed to the uniformitarian strategy of understanding earth history. Darwin's theory of coral reefs is designed to pick up on a problem in Lyell's theory, and the same is true of the disastrous foray into explaining the parallel roads of Glen Roy. All terrain is to be seen as in a perpetual state of rising and falling. And again deism comes in, for instead of appealing to miracles or catastrophes, one is explaining through unbroken laws or natural processes – rain, snow, erosion, silting, earthquakes, and so forth. God is working through law. The god that is of the deist, the god of Lyell (who was worshiping with the Unitarians) and of his inspiration, the Scottish geologist James Hutton.

Finally let us not forget that Darwin's mother's family, the family of his Uncle Josh and of his soon-to-be wife and religiously earnest

cousin Emma Wedgwood, was also deistic. They were Unitarians and had supported Coleridge for a while when he was a minister. As manufacturers – the pottery works from which flowed so much money – they believed in machines and progress and a god who backs all of this. As the reverend Baden Powell (a latitudinarian Anglican) was to say later: “Precisely in proportion as a fabric manufactured by machinery affords a higher proof of intellect than one produced by hand; so a world evolved by a long train of orderly disposed physical causes is a higher proof of Supreme intelligence than one in whose structure we can trace no indications of such progressive action.” The wonder almost would have been had Darwin not become an evolutionist.

Now what about the move to natural selection, the move that made Darwin a Darwinian? Note at once that this was a very English move to make – a very Cambridge move to make, for a graduate like Darwin. Darwin was trying to be Newtonian. He knew he had to find a cause and that this cause had to be like a force. This was always a key feature of the mechanism of selection, a mechanism moreover that Darwin presented as being a *vera causa*, what Newton demanded. Darwin got his concepts of what it is to be a *vera causa* from the philosophers John F W Herschel and William Whewell, and this

structured the argument of the *Origin* – first the analogical move from artificial to natural selection, and then the consilience of inductions as Darwin explained so much using the unifying cause of selection.

In the route to discovery, Darwin went rapidly to artificial selection, and then spends the months until the end of September 1838 looking for a natural equivalent of this process. Artificial selection connects to British origins in two ways. First, the very process of artificial selection was bound up with an agricultural revolution – making better sheep and cows and root crops – that would feed an industrial revolution, the place where Britain was first with the most. Uncle Josh for instance was breeding merino sheep. Then artificial selection speaks to that feature of the organic world that Darwin thought most significant of all, namely its design-like nature, its adaptedness, its showing final cause. Organisms are not just thrown together but they are made of adaptations that function, that work. This was a key phenomenon for Darwin that he had learnt from his reading of Paley, as well as his mentors at Cambridge. (And, as first filtered through the teachers, to Darwin's knowledge of the work of Cuvier – to Darwin's conviction of the significance of the idea of the Conditions of Existence.) For Darwin, design was always the key issue and any adequate mechanism had to speak to it. (I suspect it was

also important as Darwin wrestled with the question of how the Galapagos organisms got as they were.)

Then – the second big step in the solving of the problem of cause, seeing how selection functions in nature – there is the struggle for existence that Darwin got from reading Malthus. (Darwin would have encountered the concept before, for it is frequently mentioned in Darwin's reading, including in Lyell's *Principles*.) Note that this move by Darwin is something that occurs very much in a British natural theological context. Malthus wanted to know what it was that got people up off their backsides and working. Why do we not spend all day long doing nothing? Because if we did, then the population pressures would overwhelm us and we would starve. God has designed it so that we will make an effort. More than this, Malthus appealed very much to the manufacturing class of which Darwin was a part, for he suggested that there is little point in spoiling the workers – they will only ask for more and breed more and exacerbate the problem. It is true that Malthus was anti-progress, but as noted it was Darwin's genius to turn things on their head and to make of ideas something very different from that which their authors intended.

There are other British ideas crucial to Darwin. Admittedly

initially learnt in a biological context from the Belgian-born Henri Milne Edwards, but going back to Adam Smith and much loved by the Darwin family, is the idea of a division of labour. You can make more pins by splitting up the job and each person specializing on one task. Charles Darwin made much of the division of labour, both at the individual level and at the group level. It was a major support of his explanation of the evolution of different species. He argued that such species would be able to exploit ecological niches much more efficiently, if they were in fact designed for the different niches, and not identical.

The advantage of diversification in the inhabitants of the same region is, in fact, the same as that of the physiological division of labour in the organs of the same individual body -- a subject so well elucidated by Milne Edwards. No physiologist doubts that a stomach by being adapted to digest vegetable matter alone, or flesh alone, draws most nutriment from these substances. So in the general economy of any land, the more widely and perfectly the animals and plants are diversified for different habits of life, so will a greater number of individuals be capable of there supporting themselves.

Enough has been said. Evolution by natural selection is a British theory by a British scientist. Let us have no more talk of the all-swamping Romantic influence.

Deciding

How are we to choose between these two very different pictures? Let me give a number of reasons for thinking that the British picture is right and the Romantic picture is wrong.

First, and perhaps most importantly, do note what a truncated Darwin we are being offered by Richards. He discusses natural selection, but never as a mechanism in its own right and with its own distinctive origins and purposes, namely to explain adaptation. It is discussed as an exemplification of the constant and detailed working of the god of the Romantics. But this is to belittle the notion to triviality. If natural selection is not the central thing in Darwin's thinking – in the thinking of all who follow him intellectually – I do not know what is. It is in having come up with a mechanism to explain evolution – a good strong mechanism to explain the most pressing question in biology, namely adaptation – that Darwin's claim to scientific fame rests. Yet this mechanism is essentially absent from the Romantic picture. It

does not figure in pre-Darwinian Romantic thought – Goethe, von Humboldt, Owen or any of the others – and it does not figure that greatly in post-darwinian Romantic thought – Haeckel particularly. It speaks to utilitarian design, and that is not a Romantic notion. It is a trite thing to say, but Darwin without selection and the problem of adaptation really is Hamlet without the prince. It is true that it is also Darwin without something that we have seen is embedded in the British agricultural revolution, so without selection Darwin is indeed less British. So this is a victory scored by Richards but at too high a cost. And this is before we start to mention other very British-based aspects of Darwin's thought that are omitted, notably the division of labour.

Second, there is Richards's basic claim that the world of Darwin – a world where the divinity is ever-present, always working – is the world of the Romantics, rather than the world of the miracle-mongering god of the Christians. This is true, but the world of Darwin is also the world of the British deist, who sees God as ever-present in the working of the creation. The world is not a dead object that God has now forgotten, but one in which His creative powers are always in play, as He produces His masterpiece. One of which, of course, in which evil is seen as a necessary part of the whole, making for the

triumph of good – namely the emergence of *Homo sapiens*. Consider Erasmus Darwin. “Would it be too bold to imagine, that all warm-blooded animals have arisen from one living filament, which THE GREAT FIRST CAUSE endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations; and thus possessing the faculty of continuing to improve by its own inherent activity, and of delivering down those improvements by generation to its posterity, world without end?” This is not sterile materialism, nor is the poetry quoted above. This is a god who is working all of the time. If this was so for the deist grandfather, then why not the same for the deist grandson? Such thinking was certainly not gone by the time that Charles was writing. Consider Robert Chambers writing at the beginning of the 1840s. “The inorganic has one final comprehensive law, GRAVITATION. The organic, the other great department of mundane things, rests in like manner on one law, and that is, – DEVELOPMENT. Nor may these be after all twain, but only branches of one still more comprehensive law, the expression of that unity which man’s wit can scarcely separate from Deity itself.”

Third, the language itself. Richards quotes Darwin’s *Origin* as evidence of the influence of Romanticism. Let me requote the final

part of the first instance of this passage, the *Sketch* of 1842, and follow this by quoting from a review of Comte by David Brewster – Scottish natural theologian par excellence – written and read by Darwin in 1838. I highlight words that occur in both passages.

There is a simple *grandeur* in the *view of life* with its powers of growth, assimilation and reproduction, being *originally* breathed into matter under one or a few *forms*, and that whilst this our *planet* has gone circling on according to fixed laws, and land and water, in a *cycle of change*, have gone on replacing each other, and from so simple an *origin*, through the process of gradual selection of infinitesimal *changes*, endless *forms* most beautiful and most wonderful have been evolved.

In considering our own globe as having its origin in a gaseous zone, thrown off by the rapidity of the solar rotation, and as consolidated by cooling from the chaos of its elements, we confirm rather than oppose the Mosaic cosmogony, whether allegorically or literally interpreted...

In the grandeur and universality of these views, we forget the insignificant beings which occupy and disturb the planetary

domains. Life in all its forms, in all its restlessness, and in all its pageantry, disappears in the magnitude and remoteness of the perspective. The excited mind sees only the gorgeous fabric of the universe, recognises only its Divine architect, and ponders but on its cycle and desolation.

I would argue that the evidence is overwhelming that Darwin's famous passage is a modification of a piece of typically British, natural theological writing and that there is no need to go to Romanticism for sources. If you disagree with me about the direct influence of Brewster, then you must still admit that Darwin is surrounded by this sort of stuff and have the task of showing why it is that Darwin had to reach out beyond, to other non-British sources.

Fourth, there is the question of mechanisms and machines. Richards argues that this is alien to Romantic thought and that it is alien to Darwin's thought. Since Richards refers not just to the *Origin* but to the *Descent* to make his case, it is surely legitimate to refer to the little book on orchids written by Darwin just after the *Origin*. In this book, Darwin was laying out evolutionary biology as he hoped it would be done. "I think this little book will do good to the *Origin*, as it will show that I have worked hard at details, and it will perhaps, serve

[to] illustrate how natural History may be worked under the belief of the modification of species" (Letter to his publisher, John Murray, September 24, 1861). It is teleological in the machine sense throughout. The very title flags you to this fact: *On the Various Contrivances by which British and Foreign Orchids are Fertilized by Insects, and on the Good Effects of Intercrossing*. Darwin was looking at the organic world as if it were an object of design by one of his grandfather's manufacturing friends: he was taking organized end-directed complexity as the absolutely crucial key to unlocking the secrets of the living world and its attributes. Contrivances are human-made objects, which are created with an end in view. As in: "I have discovered/invented a remarkable contrivance for getting the corks out of wine bottles." This was Darwin's perspective on the living world, just as it had been for Paley.

Then, when we get into the text of the orchids book, the theme continues. Thus right at the beginning, speaking of how an orchid is fertilized, Darwin described in detail the "complex mechanism" which causes this to happen. There are little sacks of pollen which are brushed by an insect as it pushes its way in, in search of nectar. But not just little sacks. Rather little sacks (or balls) which are going to go travelling. "So viscid are these balls that whatever they touch they

firmly stick to. Moreover the viscid matter has the peculiar chemical quality of setting, like a cement, hard and dry in a few minutes' time. As the anther_cells are open in front, when the insect withdraws its head,... one pollinium, or both, will be withdrawn, firmly cemented to the object, projecting up like horns." Then when the insect visits another plant, the pollen is transferred. But not just by chance. "How then can the flower be fertilised? This is effected by a beautiful contrivance: though the viscid surface remains immoveably affixed, the apparently insignificant and minute disc of membrane to which the caudicle adheres is endowed with a remarkable power of contraction..., which causes the pollinium to sweep through about 90 degrees, always in one direction, viz., towards the apex of the proboscis..., in the course, on an average, of thirty seconds."

Most remarkably, Darwin recognized that with evolution there is a significant shift sideways of our understanding. Unlike a human creator (or God for that matter), who can design from scratch and can call up tools and materials as needed, evolution through selection is constrained. It has to do with what is at hand. It is rather like being stuck in the desert with a malfunctioning car. Save you can make do with what you have, you will perish. You cannot send to the garage for spares.

Although an organ may not have been originally formed for some special purpose, if it now serves for this end we are justified in saying that it is specially contrived for it. On the same principle, if a man were to make a machine for some special purpose, but were to use old wheels, springs, and pulleys, only slightly altered, the whole machine, with all its parts, might be said to be specially contrived for that purpose. Thus throughout nature almost every part of each living being has probably served, in a slightly modified condition, for diverse purposes, and has acted in the living machinery of many ancient and distinct specific forms.

Enough said.

Fifth, there is the question of homology. Richards is right. This is prominent in Romantic thought and Darwin surely was influenced by such thought, if only through his friendship with Owen. But it is also in other sources, starting with Erasmus Darwin. (Actually, starting with Aristotle.) It is in French thought with which Darwin was acquainted, notably Étienne Geoffroy Saint-Hilaire. It is discussed by Darwin's teachers and mentors as well, for instance by Whewell in his *History of*

the Inductive Sciences – a work that Darwin read twice in 1837. So this is hardly something exclusively Germanic. And more than this, for Darwin homology was always a consequence of evolution rather than something put right up as the fundamental starting point of discussion. (Darwin quickly jettisoned the vertebrate theory of the skull as soon as Huxley criticized it.) Darwin was with Paley and Cuvier and Sedgwick and all of the others on this. Conditions of Existence (what Darwin tended to call Conditions of Life) were primary for him. He knew of homology, Unity of Type, and was not about to dismiss its importance, but it was something that fell out of evolution rather than something primarily to be explained first by the causes.

Sixth comes embryology. Again, Richards is right in drawing attention to the Romantic origins of this idea and of its significance for Darwin. But do note that in the *Origin* the embryological explanation that is really of key significance for Darwin is the selection-based explanation of why it is that the young can be so similar and the adults so different. Here Darwin is right into discussion about animal breeders and how it is that they select for adult forms rather than juveniles, and why this is the same for the natural world.

Fanciers select their horses, dogs, and pigeons, for breeding,

when they are nearly grown up: they are indifferent whether the desired qualities and structures have been acquired earlier or later in life, if the full-grown animal possesses them. And the cases just given, more especially that of pigeons, seem to show that the characteristic differences which give value to each breed, and which have been accumulated by man's selection, have not generally appeared at an early period of life, and have been inherited by the offspring at a corresponding not early period.

Again, therefore, it is a mistake to go overboard with the Romantic links and to ignore the British connections with and sources for Darwin's thinking.

Seventh we have progress. Let me praise Richards for having so consistently stressed that Darwin is a progressivist and that this comes through in his scientific writings. But why do we need to go to Germany for the source of all of this, when we have so much at home, starting with the deism – think of Erasmus Darwin's enthusiastic progressionism – and going on to the general, liberal socio-economic vision that Darwin shared with his family? More than this, Darwin was always uncomfortable with being too obviously a biological

progressionist and wanted to get away from all of those notions of necessary upwards rise that we properly associate with German thought – a kind of teleological momentum upwards that we see in both the individual and the group. Remember that famous comment Darwin made on the flyleaf of his copy of *Vestiges*, about staying away from talk of “higher” and “lower.” And when Darwin did tackle progress seriously, in the third edition of the *Origin*, he tied it in with selection, offering a version of what today’s evolutionists call “arms races.” Things get better in competition and this leads to a kind of absolute advance emerging from relative advance. “If we take as the standard of high organisation, the amount of differentiation and specialisation of the several organs in each being when adult (and this will include the advancement of the brain for intellectual purposes), natural selection clearly leads towards this standard: for all physiologists admit that the specialisation of organs, inasmuch as in this state they perform their functions better, is an advantage to each being; and hence the accumulation of variations tending towards specialisation is within the scope of natural selection.” This is basic British biology.

Eighth, following on this point, there is the matter of the perfection of organs, something expected in a Romantic view of life

and something that Richards claims true of Darwin. "From the time he read Paley's *Natural Theology*, Darwin never doubted that organs like the eye – Paley's favourite example – were adaptations of extreme perfection, hardly the sort of thing a machine could produce." I confess that I had always thought that the thing about machines is that they can produce perfection – have you ever tried to plane a piece of wood so that the top (say for a table) is absolutely flat and smooth? But in any case, as the late Dov Ospovat showed, there was a major shift in Darwin's thinking from the initial writings on evolution to the *Origin*, in which Darwin moved from perfection to a kind of relativism – this would be linked with the move from an inevitable upwards move to something that can come only through the production of relatively good features (as is produced by arms races). The eye is certainly not taken as perfect. "The correction for the aberration of light is said, on high authority, not to be perfect even in that most perfect organ, the human eye." By the sixth edition, the German physiologist Hermann von Helmholtz was quoted on the eye's failings. "That which we have discovered in the way of inexactness and imperfection in the optical machine and in the image on the retina, is as nothing in comparison with the incongruities which we have just come across in the domain of the sensations. One might say the nature has taken delight in accumulating contradictions in order to remove all foundations from

the theory of a pre-existing harmony between the external and internal worlds.”

Ninth, there is the matter of the origin of life. Darwin is sensibly cagey on this issue, but to tie his thinking to Romanticism is an exaggeration. If he did think there were several basic original forms, then Cuvier is as good an influence as any. But, in any case, Darwin cuts down on the numbers: “a few forms or into one,” he says in the *Origin*. Later, in private letters, he speculates on purely mechanical or chemical methods by which life might have started. “It has often been said that all the conditions for the first production of a living organism are now present which could ever have been present. But if (and oh! what a big if!) we could conceive in some warm little pond, with all sorts of ammonia and phosphoric salts, light, heat, electricity, etc., that a protein compound was chemically formed ready to undergo still more complex changes, at the present day such matter would be instantly devoured or absorbed, which would not have been the case before living organisms were formed.” I do not see that any of this must be traced back to Goethe and company.

Tenth and finally, we come to humans. That Darwin included humans in the evolutionary picture hardly calls for comment – all evolutionists did this, and put humans at the top. That Darwin was so

comfortable about this, or at least not worried – unlike Lyell for instance – is at least partly due to his experiences with the savages from Tierra del Fuego, particularly those being returned by the *Beagle* after a couple of years in England. Seeing them so rapidly revert to type taught the ship's naturalist a lesson that he never forgot. We humans are close to the animals.

The story of the *Descent* is a somewhat different matter. The reason why Darwin wrote the book is that Alfred Russel Wallace – the co-discoverer of natural selection – had taken up spiritualism and thought that humans had been produced by divine guidance. To this end, Wallace seized on certain features like our hairlessness and our big brains – features that he did not think could have been formed by natural selection. Darwin agreed, but invoked sexual selection to do the job instead. This is the reason for the odd balance of the *Descent* which is mainly about sexual selection and only partially about humans. But whatever the reason, the fact is that sexual selection is the main mechanism producing human features and sexual and racial differences – and this is as non-holistic a mechanism as you could imagine. It sets one species member against another. It is the epitome of individual selection. So the whole approach of the *Descent* is anti-Romantic in this sense. (Parenthetically, Richards is a little

confusing on the origin of the *Descent*. He claims it was triggered by a dispute between Darwin and Wallace over sexual selection. They did differ, with Wallace arguing against sexual selection through female choice – although, paradoxically, later in life he adopted this for humans. But the real spark was the issue of spiritualism, and Wallace citing certain features as impossible through natural selection. This led Darwin to make much more of sexual selection.)

As also, of course, is the very British attitude that Darwin takes to human nature and such things as Western civilization. In the *Descent*, there are not only speculations about the biological superiority of the Scots over the Irish (in the lingo of the trade, the latter are r-selectionists and have lots of children and give them little care, whereas the former are K-selectionists and have few children but look after them), but also about such things as the virtues of capitalism. The grandson of Josiah Wedgwood was loyal to his class. It is true that we do not all start life with the same benefits. “But this is far from an unmixed evil; for without the accumulation of capital the arts could not progress; and it is chiefly through their power that the civilised races have extended, and are now everywhere, extending their range, so as to take the place of the lower races.”

What about ethics? It is to Richards's credit how he has stressed the group thinking in Darwin's position on this subject. But there are some issues that should be raised, beginning with the fact that for all Darwin-the-Romantic supposed saw the world as impregnated with value, he did not simply deduce morality from nature (as someone like Herbert Spencer then and E O Wilson now would do) but gave an explanation of how morality evolved and then basically concluded (in a very British empiricist fashion) that this is about all one can do by way of justification. Then next, there is the fact that Darwin was far from an enthusiastic group selectionist, and had argued this issue with Wallace through the 1860s – the latter being enthusiastic for group mechanisms and Darwin holding back and thinking that individual selection must be the norm. So if Romanticism equals holism equals enthusiasm for group mechanisms, count Darwin out. More, as Richards himself notes, when Darwin did give in for human morality, at once he covered himself with a form of individual mechanism, namely reciprocal altruism. Perhaps morality is a function of the "you scratch my back and I will scratch your back" way of thinking. (Note also that Darwin did not have modern genetics, so he simply could not have seized on the explanatory virtues of kin selection at that time, so he was not rejecting an available individual mechanism that we today would accept). Further, Wallace was a group selectionist because of

his socialism, that he got from the Scottish mill owner Robert Owen. So if you are going to make something of Darwin as a holist, then there are certainly home-grown philosophies that should be considered. I do not myself for a moment think that Darwin was a socialist, but before you go for continental philosophies you should reject the native ones. And finally, on top of all of this, as Richards again notes, Darwin's moral thinking was very much in the British tradition of the eighteenth century that supposed ethics to be driven by moral sentiments. Even if Darwin was against utilitarianism, there are other British moral philosophies that have first claim on Darwin's allegiance.

Ten points are enough. I am not Martin Luther and Robert Richards is not the Catholic Church. Darwin was buried in Westminster Abbey, that Valhalla of British heroes. How appropriate!

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