

## Introduction

If I were to give an award for the single best idea anyone has ever had, I'd give it to Darwin, ahead of Newton and Einstein and everyone else. In a single stroke, the idea of evolution by natural selection unifies the realm of life, meaning, and purpose with the realm of space and time, cause and effect, mechanism and physical law.

D. C. Dennett (1995)

This is the judgment of the philosopher Daniel Dennett about the English naturalist Charles Robert Darwin, who discovered the theory of evolution through natural selection, published in 1859 in his *Origin of Species*, the work that provides the ongoing framework for evolutionary studies today. It is a judgment with which I concur. Many do not. Most obviously, there are the many American evangelical Christians who take the words of the Bible absolutely literally and who hence assert that the world and its denizens were created by God, miraculously, some six thousand years ago, in the space of a week. Recently, these "Creationists" have been joined by believers of a more sophisticated ilk, the so-called Intelligent Design theorists, who argue that no natural account of origins can be adequate, and hence that all histories must make space for special interventions by some form of thinking being. These are people at one end of the religious spectrum, yet even those toward the other end – those who argue that Genesis must be interpreted metaphorically and that God did create according to laws of evolution – tend nevertheless to suppose that blind laws need help, that they need special pushes, to create the wonderful world of life and to alleviate the harshness of the Darwinian process.

It is easy and natural for those of us of a more secular bent to smile somewhat smugly at what we take to be the insecurities and failings of the religious. We do not reject evolution, even for humans, and we want no interventions from outside nature. But interestingly and depressingly, when it comes to Darwinism – natural selection as the chief causal process behind all organisms – large numbers of people stand virtually back to back with the religious critics. It is well known now that many students of literature and (particularly) those drawn to cultural studies have little but contempt for (and, one suspects, fear of) almost everything to do with science and technology. Notorious is their claim that there is no objective truth and that everything – science particularly – is a social construction, an epiphenomenon of the society in which it is produced. A scientific theory tells us no more about reality than does a political manifesto or a preacher's sermon. In this gloomy assessment, Darwinian evolutionary theory always has a special place – right at the center of the pit of damnation reserved for the very worst sinners. Supposedly, Darwinism reflects and justifies the grossest sins in our society – domination, greed, selfishness, sexism, and more. Those who have tried to portray Darwinism positively in literature must be tarred with the same brush. In the opinion of the many historians who espouse this ideology of science, all of this is hardly a surprise. Apart from the fraud and plagiarism that would make the most hardened internet-essay buyer blush, the coming of Darwinism was more an excuse for various people in the nineteenth century to park their prejudices in a respectable place, and this is a practice that has continued down to the present.

Many members of the social sciences – particularly in areas like sociology and cultural anthropology – feel much the same way. The very suggestion that humans might be animals, reflecting their biology like other brutes, is enough to bring on apoplexy in the nicest and best-qualified assistant professors. If not that, then firmly shut mouths and minds as tenure decisions loom. Darwinism supposedly leads straight to “genetic determinism” and other horrible philosophies that still have the odor of the vile world systems of the first part of the twentieth century. At the other end of the scientific spectrum, we now have physicists who tell us that their science can do it all for us – that there is no real need of natural selection. The laws of physics, unaided, can produce and explain everything worth knowing about organisms. Even the new areas of inquiry, like cognitive science, are getting into the act. People whose only knowledge of

the living world has been filtered through the glow of the computer screen calmly tell us that their algorithms prove that the ideas of the *Origin* are now as outmoded as phlogiston theory and Ptolemaic astronomy.

What is truly surprising is that this skepticism is to be found in the biological sciences, even in evolutionary studies. For the past three decades, there have been well-qualified and articulate evolutionary biologists who have been showing so visceral a hatred of Darwinian thinking that one suspects that their objections cannot be grounded purely in theory or evidence. Tempting as it is to indulge in psychoanalytic hypotheses about lack of self-worth, the reasons are probably more prosaic. The more noted critics are avowed Marxists – one book dedication runs “To Friedrich Engels, who got it wrong a lot of the time but got it right where it counted” – and this bastard offspring of Hegelian idealism, itself an attempt to rejuvenate the traditional religion of the centuries, is taken to be reason enough to abjure any theory that suggests that biology might make humankind at one with nature. The underlying themes of Christianity run deep and emerge in unexpected places. What turns all of this from farce to tragedy – especially for me, a professional philosopher – is that these critics, the evolutionists particularly, have infected my own field of study. For more than a quarter-century now, there has been an apparently limitless flow of philosophical invective directed against Darwinism. Even when it is temperate, it is almost uniformly negative or belittling.

It is the nature of philosophy that its practitioners are drawn to attack received or standard positions – that is how we make our living, and there is no shame in that. But when you have a dominant scientific theory that its practitioners think is working magnificently well, and when one philosopher after another after another devotes large chunks of a career to proving that it is conceptually flawed and morally dubious, then one does start to wonder. It is all too reminiscent of those clever Jesuits who hauled Galileo over the coals for being a Copernican. Could it be that these most secular thinkers are a little scared that we humans might not be all that special after all? Can they not handle the awful truth that, after Darwin, the starting point of philosophical inquiry must be that we are the end product of a long, slow, natural process of selection rather than the creation of a good God miraculously on the Sixth Day? In the immortal words of Margaret Thatcher to George H. W. Bush when he showed signs of doubt and hesitation, when push comes to shove, are they getting a little wobbly? Thank goodness, there is yet time for repentance of

sinners. Having spent a lifetime rejecting God and promoting Darwinism, the philosopher Anthony Flew has had a road-to-Damascus experience. Science cannot do it all. There must be something out there bigger than the both of us. “As people have certainly been influenced by me, I want to try and correct the enormous damage I may have done” (Wavell and Iredale 2004, 7).

At the risk of damning myself in the eyes both of sound scholarship and of God, let me be categorical. All of the critics of Darwinism are deeply mistaken. Charles Darwin was a good scientist, the biological revolution of the nineteenth century led to genuine understanding, and today’s version of the theory is good quality science. It tells you important things about the real world. The integrity of evolutionists in general, and of Darwinians in particular, does not give great cause for complaint or alarm. It is of fundamental importance to philosophy to recognize the implications of Darwin’s work for the major questions of knowledge (epistemology) and morality (ethics). Life would be much poorer without creative writers, and one welcomes the fact that they turn their attention to evolution. Whether what they say about Darwinism is a cause for concern is another matter. Finally, although, like all good science, Darwinism challenges religion, Christianity specifically, it can and should provide a positive and creative stimulus for religious people to think about their faith and move forward in a richer and deeper way. But let me not spend time telling you about what I believe. Let me turn at once to telling you why I believe what I believe.

## CHAPTER ONE



# Charles Darwin and His Revolution

It is not to be expected of Darwin that he should have been troubled by thoughts of fallibility, relativity, or indeterminacy; but only that he should have observed the standards of his own time. And it was by those standards that he was in arrears. Nineteenth-century science was sufficiently aware of the desirability of precision and standardization to make Darwin's tool chest seem distinctly unprofessional. In this, as in other respects, he gives the appearance of an amateur, an amateur even for his own day.

G. Himmelfarb (1959)

The above quotation is about Darwin as a practicing scientist and about how he went about things on a daily basis. It is typical of a certain strain of thought. At least here Darwin is only being labeled second-rate. His moral integrity is not being impugned. Others feel less constrained. Often we learn that Darwin's supposed virtues were equally his vices: "a conservative outlook in every respect except the evolutionary hypothesis; a failure to recognize or to relate his own ideas, his larger ideas, with those of others working in the same field; and a flexible strategy which is not to be reconciled with even average intellectual integrity" (Darlington 1959, 60). No wonder the conclusion is that "Darwin was slippery."

These are judgments made nearly fifty years ago, and in the time since then a veritable Darwin industry has grown up, publishing hitherto-unseen documents, assessing and reassessing the personality and actions of Darwin and his fellows, and looking at broader issues (Ruse 1996a). But in some respects things are little better. One prominent scholar has made a whole career out of arguing that what we truly had was a

“Non-Darwinian Revolution” (Bowler 1988, 2005). Others doubt that there was a revolution at all, and certainly do not think that it was truly Darwinian (Hodge 2005). It is argued that picking out one person, Charles Darwin, rather than any other is a matter of hero making after the event, and probably tells us more about our needs and interests than about anything that actually went on at the time (Secord 2000). There are others who agree that there was a revolution and that Darwin rode the crest of it, but (much as is suggested in the quotation above) who think that really Darwin was drawing on the efforts of others. The spade work was done for him (Herbert 2005; Lennox 2005). One variant of this line of approach is to suggest that although it is true that Darwin himself was English, it is a mistake to think that the Darwinian revolution was essentially English. Depending on the person writing, it is argued that the really important moves were made on the continent; France and Germany most commonly favored (Richards 2003; Corsi 2005).

So what did happen and who does deserve the credit? Let us see.

### The Problem of Final Causes

The earliest evolutionists, as we would understand them – thinkers proposing the idea or fact of evolution, namely, common origins for organisms, and believing that everything occurs according to normal laws of nature – were people like the general man of letters, the Frenchman Denis Diderot, writing in the middle of the eighteenth century. We must ask two questions. First, why did it take so long for such an idea to emerge? Second, why did it emerge exactly when it did? You might think that answers to both of these questions rest ultimately on empirical discoveries, and to a certain extent you would be right. Although the major focus of the Scientific Revolution that had begun two centuries earlier was on physics and later on chemistry, increasingly attention was directed to the life sciences broadly construed. The invention of the microscope stimulated interest in the world that exists beneath our vision; journeys of exploration brought back fabulous new finds of various life forms around the world; and this is not to mention the side effects of technology and the growing methods of industry – the fossil finds, for instance, thrown up by mining and by the labors involved in building roads and (increasingly) canals. But none of these findings really speaks right to our questions. Back at the time of the ancient Greeks, four or five centuries before Jesus, there were

speculations of at least a quasi- or proto-evolutionary kind. Empedocles suggested that there were disembodied parts of organisms floating around, and that sometimes these came together, and that if they worked, they cohered and reproduced. Why did such an idea not take off back then? There was one major reason why such an idea did not convince. The serious thinkers – people like the philosophers Plato and Aristotle – simply could not see how the intricate functioning parts of organisms, what we now call “adaptations,” integrated into full living beings, could come about through blind, undirected law. The engineers call it Murphy’s Law: if things can go wrong, they will. Blind law leads to disorder and to mess, not to complex entities working toward ends (Ruse 2003).

What then does lead to complexity working toward ends? The Greek philosophers had the answer: intelligence. Aristotle referred to the causes that bring on adaptive functioning as *final causes* (as opposed to things like efficient causes, which start things going), and for two thousand years it was these that made ideas of evolution simply not plausible. It was not old-fashioned prejudice but common sense. Where and what is the intelligence lying behind final causes? With the coming of Christianity, the great theologians – Saint Augustine and Saint Thomas Aquinas – argued that final causes point to the divine intelligence at the center of their religion. This yielded the so-called Argument from Design or Teleological Argument for the existence of God. “We see that things that lack intelligence, such as natural bodies, act for an end, and this is evident from their acting always, or nearly always, in the same way, so as to obtain the best result. Hence it is plain that not fortuitously, but designedly do they [things of this world] achieve their end.” From this premise, we move to the Creator behind things. “Now whatever lacks knowledge cannot move towards an end, unless it be directed by some being endowed with knowledge and intelligence; as the arrow is shot to its mark by the archer. Therefore some intelligent being exists by which all natural things are directed to their end; and this being we call God” (Aquinas 1952, 26–7).

In the Scientific Revolution, the notion of final causes came under heavy attack in the physical sciences. They were judged scientifically useless and misleading. The philosopher Francis Bacon referred to them as akin to the Vestal Virgins – decorative but sterile. Yet in the biological areas of science, it was agreed that it is impossible to study nature without making reference to ends, to intentions, to values. “For there are some things in nature so curiously contrived, and so exquisitely fitted for certain

operations and uses, that it seems little less than blindness in him, that acknowledges, with the Cartesians [the followers of the seventeenth-century French philosopher and mathematician René Descartes], a most wise Author of things, not to conclude, that, though they may have been designed for other (and perhaps higher) uses, yet they were designed for this use" (Boyle 1688, 397–8).

This brings us to the eighteenth century, with people seeing that organisms need final causes for their explanation, and recognizing also that final causes seem inexplicable in purely natural terms. Evolution is a naturalistic explanation. Hence, evolution seemed an unreasonable position. Why then did evolutionary ideas start to emerge? Almost paradoxically, the reason lies in the Christian religion. As people started to find Christianity less and less compelling – as philosophers showed that it was unreasonable, as travelers brought back tales of other religions and other civilizations, as the move to an industrial world made the social force of the old beliefs less compelling and pertinent – they nevertheless sought alternatives in terms that Christianity had set. Although the Greeks had histories, they did not have a world history in our sense. They thought of the universe as eternal – going in endless cycles, with some limited variations here on Earth, but ultimately with no real direction. There was no creation out of nothing. Moreover, we humans were not the central focus of the action, however important we may seem to ourselves. Aristotle's God spent his time contemplating his own perfection and had no interest in us. The Jewish story of origins, taken up into Christianity, changed all of that. We have a beginning, a middle, and talk of an end. We have the creation of life from nothing. We humans have a special status, because we are made in the image of God. The world does not necessarily exist just for us, but we are the star players. We have the story of our Fall, but then comes the drama of Jesus and his sacrifice on the Cross, creating the possibility of our salvation. We have our roles to play, worshiping God and loving our neighbors. And finally, if everything works out, assuming that God is on our side and we have done what we should, we have the promise of eternal life.

People were looking for a non-Christian alternative, but set in the Christian terms – history, meaning, humans. Evolution told just such a story, offering rival answers to these same questions. It tells us where organisms came from – they started as primitive blobs way back when, and then grew and developed up to the forms that we have about us now.



It puts us humans up at the front of the picture, as the most important organisms, that to which all has been pointing. It gives us tasks to do, namely, to keep things going and to make sure that things do not fall back – even better, to keep things moving forward. And finally, it offers hope of a brighter tomorrow, if not for us, then for our children and our children's children.

The reader today might question all of this – we ourselves will be questioning much before this book is finished. But for now, leave how you think that evolution should be interpreted, and go back nearly three hundred years to the way that the first evolutionists thought of the topic. Powerful at that time was a growing belief in the possibility and importance of progress – the idea that through our own efforts we humans ourselves can make life better and more efficient, in the realm of culture and technology. France particularly (but then spreading to other countries) was a home of such speculations. The idea's greatest enthusiast, Jean-Antoine-Nicholas Caritat, marquis de Condorcet, saw progress as something that started with the new discoveries in science and the arts and medicine and so forth, arguing that they lead up from error and poverty and inequality, to truth and understanding and universal harmony. It was easy for a man like this to move from progress in the social world to progress in the biological world – from the simplest to the most complex, from the least valuable to the most valuable, from the monad to the man, as people were wont to say (Ruse 1996b, 2005b).

This all tailored nicely with a notion (the so-called Chain of Being) going back to Aristotle that one can put all organisms in a line, from the simplest to the most complex – namely, us humans (Figure 1.1). Then, with a progressivist form of evolution postulated, the move was usually made in a circular fashion in justification back to the social world. Such were the speculations of Erasmus Darwin (1794–1796), grandfather of Charles, a physician writing in England toward the end of the eighteenth century. They were also the ideas – at the beginning of the nineteenth century – of the man who provided the fullest overall picture of upward natural change, the French (sometime aristocrat) Jean Baptiste de Lamarck (1809). He saw a “spontaneous generation” of lower life forms from mud and dirt, and then an upward progression through the Chain of Being, until we reach the human form. Admittedly, he thought that sometimes there are diversions and vagaries – generally brought on by the heritable effects of use and disuse, as the giraffe's neck gets ever-longer through

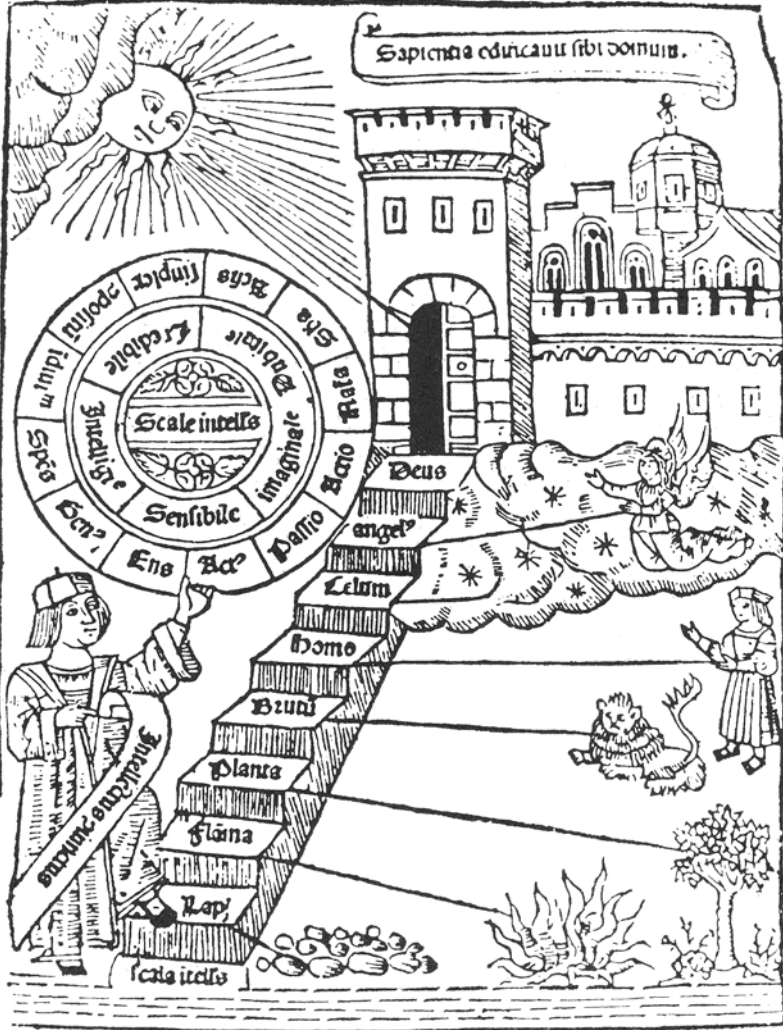


FIGURE 1.1. Ramon Lull's ladder of ascent and descent of the mind (1305).

stretching to reach leaves on the upper branches of trees (the mechanism traditionally known as “Lamarckism”) – but, overall, nature shows the progress that Lamarck, as a good French radical, thought is evidenced in the best human societies. This does not mean that Diderot and Erasmus Darwin and Lamarck and other evolutionists (including, by the end of his long life, the German naturalist and poet Johann Wolfgang von Goethe)