

Darwin for the General Reader – A Talk Given at the ACTC Conference in 2009

By Nicholas Maistrellis

I have recently produced a selection of readings from Darwin's *Origin of Species*, designed for use in interdisciplinary courses of all kinds. My talk will focus on some of the considerations that shaped this edition, but first I'd like to make some general points concerning the use of core texts with beginning students.

The use of core texts in interdisciplinary courses is full of challenges, but if we include them, our fundamental assumption must be that the texts can in some way speak directly to beginning readers. We must not approach a text as though it absolutely required scholarly commentary and analysis in order to be accessible.

This is particularly true of the kind of commentary that gives historical background as though the core text were simply unintelligible without it—as if the text were so tied to its own time that special scholarly knowledge is necessary to approach it at all. We find examples of this attitude in the many editions of the *Divine Comedy* of Dante, all of which come with massive commentaries explaining who all the characters are. Dante did in fact fill Inferno, Purgatory, and Paradise with actual people from the distant and not too distant past, and even with his contemporaries; and the commentaries provide useful information for the reader – without them we probably won't know who these people were. Years of reading Dante with undergraduates persuade me that this kind of commentary is not essential for the beginning reader, and usually gets in the way. The great dramatic moments in the work are accessible to anyone who is given a chance to simply read it. Think of the tragic poignancy of the love of Paolo and Francesca, of the grand but destructive pride of Ulysses on his last voyage, and of the meeting of Dante and Beatrice. The last thing you want a student to be doing is to be glancing back and forth between the text and a commentary to learn who these people were in real life. Dante tells you all you need to know about his characters. Paolo and Francesca fell in love when they shouldn't have, and they ended up caring about nothing but that love. That is what the story is about.

What kind of help is needed by the beginning student to enrich his reading of the

text? My claim is that this only occasionally involves historical background. In the particular case of Dante, the background that would be genuinely useful for the beginning reader would include the following: First, something about the astronomical theories of Ptolemy; second, The Bible; third, the writings of Aristotle, especially the *Ethics*; fourth, writings of St. Augustine and St. Thomas. *As is true of most core texts, the most important background reading is other core texts.* This is a general principle that we should never lose sight of. Where students cannot be counted on to have read these earlier works, the teacher has to make a judgment about how much secondary exposition, if any, should be provided to the students. This is a very difficult question which I will not attempt to answer for the case of Dante; but the safe answer is that *less is more*. Even if I were approached by a particularly enthusiastic student who wanted to further his study of Dante, I would probably not recommend any scholarly works. I would instead advise him or her to learn some Italian.

I began with the example of Dante to show that the issue I want to raise is not unique to scientific and mathematical works, although it can take a somewhat different form in them. To reiterate, the problem is to produce the kind of commentary that enriches the beginning student's reading by making the text more available – by leading the reader into it.

Classic scientific and mathematical works often present a special problem for the teacher. On the one hand, the founding works of science and mathematics can be a very good way to introduce students both to the fundamental ideas of a science and to the scientific way of thought and imagination. On the other hand, the way into the text is often barred by what seems an arcane and antiquated technical terminology. Often, though, the text is quite accessible once this difficulty is mastered. I should say that not all classical texts of science and mathematics have this problem to the same degree. Euclid's *Elements*, for example, can be read by anyone with no commentary at all. Lavoisier's *Elements of Chemistry* can be read by a beginner with minimal annotation. On the other hand, the student attempting to read Ptolemy's *Almagest* and Newton's *Principia Mathematica* will need substantial help. Also, in all these cases, someone will

have to make selections from the texts. They are all too long to be read *in toto* in a normal class.

The ability to choose selections and annotate them requires some special experience. First, one should be familiar with the text under consideration, as well as with the science which the text helped to originate. Second, one should have experience reading the text with beginning students. This second requirement is crucial. A commentator who is knowledgeable about the text but who has not shared its study with beginning students is too likely to produce commentary that reflects the state of the subject rather than responding to the needs of the reader—commentary that may be valuable and interesting in its own right, but which may tend to supplant the text rather than lead the beginner into it.

I would like now to describe briefly my approach to Darwin's *Origin of Species*.

Darwin's great work is an ideal candidate for inclusion in a core texts curriculum for a number of reasons. First, it is a truly seminal work, since it showed for the first time that the world of living things in which we ourselves live is essentially historical—that it has come into being over time through causes immanent in it. Second, it stands closer to the current practice of the science it founded than almost any other founding work. Finally, it doesn't present the great barrier of mathematics that most of the great founding works of physics do. The student can begin to enter into this work with a minimum of editorial help.

The main problem with Darwin's great work is, of course, its length. It is over 400 pages long, much too long to be read in a course that might devote three or four classes to it at most. So how should it be shortened? Darwin himself calls the book "one long argument." This give us the clue to successful abridgment.

Darwin's argument displays two interrelated structures. In one respect it is an extended analogy between *natural selection* and *artificial selection*. This analogy divides the book into two parts, Chapter One on the origin of domesticated animals and plants, and the rest of the book, which deals with animals and plants in the wild. In another respect, though, the book displays a threefold division into (1) the statement of the theory, (2) a roster of the difficulties the theory faces, and finally (3) the application of

the theory. These divisions are not absolute; all three themes are constantly playing against one another. However, it is roughly true that the first five chapters state the theory, the next four deal with interesting difficulties of the theory, while Chapters 10–13 apply the theory to a number of engaging phenomena. The final chapter recapitulates and summarizes the whole.

In my edition I chose to emphasize two things from the first chapter; Darwin's complex and subtle account of the nature of variation and its causes, and the famous story of the origin of all breeds of domestic pigeons from one wild species. I then passed immediately to the third chapter on the Struggle for Existence. Here is the true center of Darwin's theory, for it is here that he takes up the issue of the capacity of all living things to adapt to their conditions of life. He shows it to be the result, not of an established harmony but rather of the forces which come into play when the reproductive potential of all living things comes into conflict with limited resources. Darwin is at his best in this chapter, marshaling both arguments and images to present a new picture of the world around us, one in which beautiful order emerges out of apparent chaos.

The selections from Chapter Four on natural selection were chosen to show how Darwin teaches us to think about the world that Chapter Three described. The selections emphasize, first, Darwin's remarkable and wholly imaginary examples of natural selection; and second, his attempt to represent the evolution of many new species out of a single species.

Selections from Chapter Six on the difficulties of the theory focus attention primarily on the question whether an engineering model, so to speak, is the best way to view natural selection. Is the vertebrate eye, for example, best looked at as an engineer's solution to the problem of vision? Darwin argues that it is not, for such a claim would hinge upon the efficacy of purpose in nature, a purpose that is simply not present in the world under the struggle for existence.

Finally, the theory is shown at work on the problem of the distribution of animals and plants around the world, a distribution which Darwin finds to be the result of historical contingencies like the glaciers of the last ice ages and the particular distribution of land in the continents.

So much for the choice of selections from Darwin's book. The annotations to the text present a challenge. The temptation for me is to offer all the interesting insights I have had about the *Origin of Species*; but this, of course, would be a mistake, for it would deprive the student of the opportunity to make his own discoveries. It is difficult to identify general principles on how to write such annotations, but I will give one or two examples to illustrate what I think needs to be done as well as what should be avoided.

In my general introduction I ask the students to pay close attention to Darwin's title, *The Origin of species by Means of Natural Selection, or the Preservation of Favored Races in the Struggle for Life*. I do this for three reasons. First, the title does, in fact, reveal a lot about the theme of the book. It is worth some effort to ask about the word "or": Is the second half of the title a restatement of the first half or not? Second, I wish to make it clear to students, right from the beginning, that all the words of the text are to be taken seriously. Finally, focusing on the title allows me in a natural way to say something about the technical terms "species" and "race," both of which, in addition to being technical terms, also have meanings in ordinary speech. The term "race" is of course controversial, and I have tried to assist students to think about what the word refers to both in scientific and in ordinary speech. Here the annotations teach something, but in doing so aim to open up questions rather than close them off.

I had a very different purpose in mind for my annotations to Chapter One, on variation under domestication. The beginning of the chapter is a long meditation on the nature of the variations that are found among the members of even closely related forms, as, for example, a closely-bred kind of dog. If it weren't for such differences, there wouldn't be competition. Here my remarks are directed primarily to students who know a little biology and who, inevitably, will try to understand Darwin on the basis of the genetics they have learned. They will be tempted to make the distinction between germinal and somatic variations, a distinction that is not in Darwin, and whose assumption by the student would make it impossible to see the subtlety of Darwin's remarks. Basically, I encourage such students to value, but to temporarily set aside, what they have been told, in order to enter with Darwin into an inquiry based on facts and patterns that we can discern without special training. We are relying on Darwin for his immense breadth of experience, not on a store of theoretical knowledge.

Finally, a third kind of purpose is served by my remarks on Darwin's discussion of the dispersal of animals and plants during the Ice Ages. Here what is needed is factual information, primarily about the actual geography of the earth. I provide a map which illustrates how earth's land masses are not evenly distributed but largely concentrated in the northern hemisphere. I also inform the student that continental glaciations, the last of which receded about 20,000 years ago, were just beginning to be recognized by scientists in the mid-nineteenth century. Darwin had the insight that the ice age and its aftermath provided the evidence that the present distribution of animals and plants could be best understood on the basis of contingent historical causes rather than as a direct response to climate. Once these things are understood the student is in the position to understand and appreciate Darwin's argument on its own.

I hope I have produced a text that allows students to think for themselves, and discuss among themselves, some of the riches of Darwin's seminal work. I hope my review of the principles involved will be helpful to you in evaluating, or even producing, editions of other works to include in your own teaching.