

[Invited Commentary on the 200th anniversary of Charles Darwin's birth]

## From So Simple a Beginning, From So Simple a Theory\*

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**ABSTRACT:** The year of 2009 marks the 200<sup>th</sup> anniversary of Charles Darwin's birth and the 150th anniversary of the publication of his book, *On the Origin of Species*. Having survived the 150 years of hardening and tempering, Darwin's theory of natural selection is now more comprehensive and powerful than ever. It casts its shadow over nearly all academic disciplines and societal sectors. It truly revolutionized the way we look at the world and ourselves. In the midst of Darwinian revolution, however, Korea remains as a backward country as far as the understanding of Darwin and his theory is concerned. A variety of intellectual activities organized to celebrate the Year of Darwin is helping to narrow the gap. This article summarizes the kinds of such activities held in Korea this year and explains how Darwin made all this possible. To paraphrase the famous quotation by Theodosius Dobzhansky, I now dare to say, "Nothing in life makes sense except in the light of evolution."

**Key words:** Darwin Forum, Darwinian revolution, population thinking, the year of Darwin, typological thinking, variation

The world is celebrating the year of 2009 as the Year of Darwin, because it marks the 200th anniversary of Charles Darwin's birth and the 150th anniversary of the publication of his book, *On the Origin of Species*. Nearing the end of the last millennium, Gottlieb et al. (1998) published a book entitled *1,000 Years, 1,000 People*. The authors asked learned people all around the world who had influenced our lives most during the past 1,000 years, and came up with a list of top 1,000 names. Charles Darwin ranked the 7th along with Johannes Gutenberg, Galileo Galilei, Isaac Newton, and so on. If I were to run a similar survey in Korea, I know for sure that Darwin will not score even in the top 100. This is the intellectual gap existed between the world or more specifically, the West, and Korea. If such a gap displays no more than our academic inferiority, we may accept it as it is. The reality is very different, however. At the turn of the 21<sup>st</sup> century it is hard to find any academic field or societal sector over which Darwin's theory casts no shadow. It is this practical reason that we must concern about us being a backward country in Darwinian research.

With a goal of lessening the gap I launched a Darwin project in 1995 by forming 'Darwin Forum' with scholars of diverse disciplines whose research have been touched by Darwin and his theory. The first and foremost task the Darwin Forum undertook was to translate Darwin's most important books, namely *On the Origin of Species* (1859), *The Descent of Man* (1871), and *The Expression of the Emotions in Man and Animals* (1872). All three books were translated into Korean before and readily available to the Korean public, but the quality and accuracy of the translation are somewhat questionable. The members of the Forum felt that a good translation of these books could ignite the much needed study of Darwin and his theories in this country. In addition to this formidable goal, Dr. Iroo Joo, one of the Forum members is working on a book of compilation of Darwin's letters. He is sorting out the most interesting letters available from the dataset of Darwin Correspondence Project, and translating them with his own commentaries.

I too am writing a book on Darwin and Darwinian theories as part of the Darwin project. In this book I am

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trying to portray Darwin as a human being much like us, Darwin as a scientist who proposed the most complete theory of evolution, and finally Darwin as a revolutionary thinker who changed the way we see the world and more importantly, ourselves. I am currently writing for a column called *Professor Choe Jae Chun's Darwin 2.0* for *Naver*, arguably the most popular Korean internet portal. The book will come out as a compilation of my articles in *Naver*.

In addition to all this I am carrying out another rather ambitious book project in which I try to put together the dialogues with some of the most representative Darwinians of our time. It began with the request from the *Hankook Ilbo*, a major daily newspaper in Korea, which asked me to contact five famous Darwin scholars and interviewed them for the newspaper readers. I managed to interview Peter & Rosemary Grant of Princeton University, Edward O. Wilson of Harvard University, Daniel Dennett of Tufts University, Steven Pinker of Harvard University, and Richard Dawkins of Oxford University. While I was running this project I had an idea of expanding the list of interviewees and putting them altogether in a book. The Darwinians I additionally interviewed thus far include the following: Sir Peter Crane of Yale University, Janet Browne of Harvard University, Helena Cronin of London School of Economics, Steve Jones of University College London, Tetsuro Matsuzawa of Kyoto University, and two most exciting freelance writers of Darwinian thoughts, Matt Ridley and Michael Shermer, as well as James D. Watson of Cold Spring Harbor Laboratory. The total is 13 if I consider the Grants as one. I feel that it will make a handsome book. The book will be published both in Korean and English.

In addition to *Naver* and the *Hankook Ilbo*, other Korean newspapers also ran special series of articles in celebration of the Year of Darwin. To name a few, the *Chosun Ilbo* had a series called 'Darwin Came Back!' from the first day of the year and ran for several months. The series consisted of more than a dozen articles written by scholars of diverse academic fields, all of whom discussed the influences of Darwinian thoughts on their own disciplines. I added a few more chapters to these and published a total of 19 articles in the form of a book called *The 21<sup>st</sup>-century Darwinian Revolution* in August 2009. The *Joongang Ilbo* planned a series called *Darwin's Letter* prepared by Dr. Iroo Joo. Dr. Dayk Jang, another member of the Forum and the foremost philosopher of biology in Korea, has been writing very interesting columns called *Darwin's Study* for the *Joongang Sunday*. He resurrected Darwin and made him read books published after his death and then have chats with authors face-to-face or through e-mail. In this ingenious setup he re-examines

critically important books of our time through Darwin's very own eyes.

## WHY DARWIN MATTERS?

On 3 January 2006 Charlie Rose, an acclaimed interviewer and the host of the Charlie Rose Show of Public Broadcasting System, invited two giants of modern science, James D. Watson and Edward O. Wilson, on the same day. He invited them both because the two respectively had published anthologies of Charles Darwin in 2005. The title of Watson's book is *Darwin: The Indelible Stamp: The Evolution of an Idea* and Wilson called his *From So Simple a Beginning: Darwin's Four Great Books*. In the show Watson made a heck of a statement, in my opinion, quite irreversible. He said, "In my opinion, Darwin was the most important person ever lived on earth." Rose shook his head in awe and asked Watson, "the most important?" Watson replied with a boyish smile on his face, "More so than [my] Mom."

Michael Shermer, the founding editor of the magazine *Skeptic*, poses the following question in his book *Why Darwin Matters* (2006): why among the three intellectual giants of the 20<sup>th</sup> century, Darwin, Marx, and Freud, only Darwin is still influential in the 21<sup>st</sup> century? His answer is short and simple: Because Darwin, only Darwin was right. He then went on to say, "Darwin matters because evolution matters. Evolution matters because science matters. Science matters because it is the preeminent story of our age, an epic saga about who we are, where we came from and where we are going."

Quite a few of us still think of Darwin merely as a British biologist who once studied barnacles, earthworms, orchids, and so on, and proposed a hypothesis of evolutionary mechanism. Darwin is not just among many students of evolutionary biology but the one who put 'the indelible stamp' on the history of human thoughts. He is the most important evolutionary biologists of all time and at the same time among the most influential thinkers. For the past 2,000 years the mainstream of the Western philosophy has been that of Plato, namely essentialism. According to Plato's essentialism, there are 'ideas' or 'types' that represent the truths in this world. What we see in our daily lives are then imperfect images of the ever-lasting and immutable truths. Later, the deterministic ideas of Christian doctrine proved to be in a perfect harmony with Plato's philosophy and the two together dominated the thought process of the Westerners for nearly two millennia. Darwin was a thinker who gave us new eyes to look at the world and ourselves.

A great evolutionary theorist Ernst Mayr (1988) calls

the way Platonic philosophers look at the world ‘typological thinking’ and the Darwinian way ‘population thinking.’ Whereas Platonic essentialists see the deviations from the type imperfect, Darwinian populationists consider everything in the organic world unique. What is true for the human species, that no two humans are alike, is equally true for all other species of animals and plants. To Darwin variation is not an imperfect truth but existing reality that is the essential element for change. Variation is real and beautiful, certainly nothing to be shamed of—that is what Darwin taught us for the first time in the human history. Nowadays who believes that the world is composed of things unchangeable? We all know that things change in time and space. We all are now population thinkers and by that I mean, Darwinians.

### HOW DARWIN DID ALL?

The extent of achievement Darwin made is truly astonishing. Yes, he did not have to pursue an academic career as we do. He did not have to teach classes, advise students, attend committee meetings, and so forth. He had all the time he needed for his research. Even then, both the quantity and quality of the work he produced in topics ranging from the taxonomy of barnacles, behavior and ecology of earthworms, biomechanics of insectivorous plants, reproductive biology of flowering plants to various issues of geological history are beyond anyone’s imagination. How did he do all this?

First of all, he never stopped working all through his adult life. He had a financially comfortable life and could devote nearly all day everyday to his own research. Second, he had plenty of time to do repeated question-and-answer sessions within himself. He would first complete the initial writing on a well-defined topic and then ask himself a series of questions by putting himself in someone else’s shoes. For quite some time thereafter, then he would prepare answers to those self-posed questions. He also utilized a small circle of close colleagues to seek their constructive criticisms. Lastly, Darwin managed to obtain all sorts of help from a number of people all over the world. By writing kind and sincere letters he somehow made others collect specimens, carry out observations, and take measurements for him as well as exchange ideas with him. You name it! He could do all this without leaving his home.

Nonetheless, there is a widespread belief that Darwin deliberately avoided publishing his theory of evolution for a very long time. The possible reasons offered for his procrastination include his prudent and somewhat timid nature, fear of societal disapproval and possible

attack, concern for his religious wife, and even castration complex proposed by the psychologist Howard Gruber (1974). Recently, however, John van Wyhe (2007), a historian of science of Cambridge University, presented a new explanation by categorically refuting all ungrounded claims that Darwin intentionally delayed the publication of his theory. It is true that the letter from Alfred Russel Wallace prompted Darwin to hurry up the process in the last phase, but Darwin was working at his usual pace and more importantly, did not keep his thought a secret. Contrary to a popular caricature portrayed in, for example, David Quammen’s recent book *The Reluctant Mr. Darwin* (2006), Darwin was a very careful and meticulous person but not recluse or a man of mental anguish. Quite vividly documented by the sheer quantity of his letters, he corresponded with a great number of people and quite freely shared his ideas with his colleagues. If he were born again and becomes a colleague of ours in this era of high-tech communication, he would be just like us, if not more, chatting, e-mailing, texting, and so forth.

### WHAT DARWINIAN EVOLUTION IS?

Darwin was not the first who ever thought of evolution. Greek philosophers such as Aristotle, Empedocles, and so on studied fossils or had well-organized thoughts on evolutionary process. Carl Linnaeus, Georges-Louis Buffon, Jean-Baptiste Lamarck, Georges Cuvier, and Darwin’s own grandfather Erasmus Darwin were all evolutionary thinkers in their own rights. But it was Darwin’s theory that finally explained the way the world was ‘created.’ When we speak of evolution nowadays, we mean none other than Darwinian evolution, which can be succinctly defined as evolution by means of natural selection.

Shortly after he came back from the Beagle trip, he began working on the topic of the origin of species and as soon as he drew up “some short notes,” he began investigating the workings of artificial selection. He was particularly interested in a great diversity of pigeon varieties. Through this research he became quite convinced of the mechanism by which one could create a new variety through selective breeding. Then, it was his reading of Thomas Malthus’ *On Population* in 1838 to realize that the same process as in artificial selection can occur in nature without a selector. Thus, the theory of natural selection came about by replacing the word ‘artificial’ with ‘natural.’

By analyzing Darwin’s ideas presented in *On the Origin of Species*, we can draw up the conditions with which evolution can occur. They are as follows:

First, there have to be variations. Without them there will be no changes. Second, the variations have to be genetic in order to be hereditary. Third, there is the struggle for life because the resources are limited but individuals needing such resources are plentiful. This is the lesson Darwin learned from Malthus. Fourth, there are differences in reproductive outputs by different females in a population. There will be no changes if every female produces and raises exactly the same number of offspring to maturity, even when the first three conditions are met.

As long as these four conditions—variability, heritability, competition for survival, and differential reproduction—are met, evolution is bound to occur. But if any one or few of these four conditions are missing, there will not be any evolutionary changes. This is why these four conditions are called ‘the necessary and sufficient conditions.’ Can anyone think of the situation where these conditions cannot be met in the natural world? Evolution cannot stop because these conditions cannot be violated. This is why such a conservative pope the late John Paul II conceded that evolution is worthy of scientific investigation. Evolution is fact or phenomenon, and natural selection is a theory of evolutionary mechanisms proposed by Darwin, Wallace, and quite deservingly Malthus. Since evolutionary changes must occur if all those four conditions are met, natural selection, in my humble opinion, should be upgraded to be a principle or law. Evolution is an inevitable consequence of natural selection.

### EXCEPT IN THE LIGHT OF EVOLUTION?

Darwin proclaimed in *On the Origin of Species*, “... from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved.” We are indeed in awe seeing how this enormous biodiversity has evolved from so simple a beginning. In addition, I am in awe to see how the wondrous process to produce this endless stream of biodiversity can be explained by so simple a theory. A good theory must have three basic qualities, i.e., simplicity, universality or robustness, and beauty. Darwin’s theory is simple enough for even elementary school kids can understand, and yet it can apply to a bewildering range of topics. And most

importantly, it has intrinsic beauty. No other theory in any academic field has suffered longer and endured harsher attacks. With the 150 years of hardening and tempering, the theory of natural selection is now more comprehensive and powerful than ever. It truly revolutionized the way we look at the world. What has happened to the theory of natural selection is often symbolized by such phrases as Darwinian revolution, Darwinian industry, etc. by the historians of science. Theodosius Dobzhansky (1964), an instigator of the so-called ‘modern evolutionary synthesis,’ left a famous quotation: “Nothing in biology makes sense except in the light of evolution.” Now I dare to say, “Nothing in *life* makes sense except in the light of evolution.”

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