Rethinking Darwin

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A Vedic Study of Darwinism and Intelligent Design

Leif A. Jensen

with chapters contributed by

Jonathan Wells, William A. Dembski, Michael J. Behe, and Michael A. Cremo

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Introduction

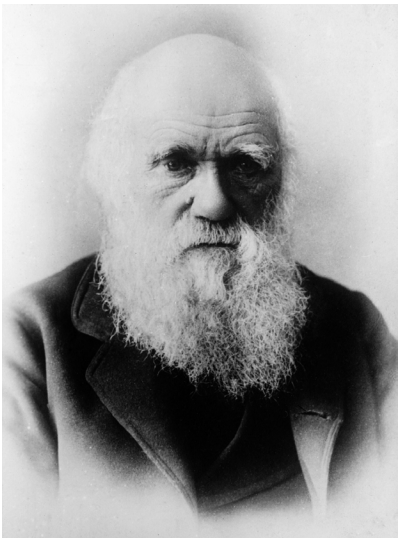
> "No biologist has been responsible for more – and for more drastic – modifications of the average person's worldview than Charles Darwin."[1]

These words were spoken by Harvard professor Ernst Mayr (1904–2005), veteran evolutionary biologist, when on September 23, 1999, he received the Crafoord Prize from the Royal Swedish Academy of Science in Stockholm. Dr. Mayr made the point that although most groundbreaking scientists, such as Albert Einstein, had a marked influence within their own fields of science, they made little impact on the way the average person apprehends the world, whereas Darwin changed the very fabric of our worldview.

And so this book. As long as the ideas of Darwin are so deeply woven into the lives of almost everyone, they will continue to be explored, explained, and critiqued from different perspectives. This book presents an overall scientific critique of Darwin's theory of evolution in a way that is accessible to laypersons, contains novel material and new perspectives that may interest even insiders within the scientific

community, and offers a alternative viewpoint to standard modern evolutionary thinking.

One distinguishing feature of this book is that it is written from the standpoint of someone trained in the thoughts of Eastern philosophy, or, more precisely, in the Vedic tradition of ancient India. This naturally has a bearing on the material selected and the issues discussed in the book, and the last chapter directly outlines a Vedic philosophy of nature as an alternative to Darwinism.



Charles Darwin (1809–1882)

Not only is this book about evolution; it is also, in its own right, the result of an evolution. It started as an idea to present some Vedic perspectives on Darwinism in the form of an easy-to-read booklet, to be published and widely distributed during the Darwin bicentennial in 2009. As the material accumulated, I saw that more than a small publication was taking shape. At one point I contacted three of the world's leading proponents of Intelligent Design, professor of biochemistry Dr. Michael Behe, mathematician and philosopher Dr. William A. Dembski, and biologist Dr. Jonathan Wells. They all found the idea of a book with a Vedic angle an interesting challenge, and each agreed to contribute a chapter. Then historian of archeology Dr. Michael Cremo, co-author of the taboo-breaking book *Forbidden Archeology* – a work directly inspired by the Vedic account of a human presence in ancient times – also consented to write a chapter. Clearly, a unique publication was unfolding. The result is what you now hold in your hand.

Until Darwin's time, mainstream science had concluded that life

was too intricate to have been caused by nature alone. Almost a hundred years before Darwin, when the Swedish botanist Carolus Linnaeus (1707–1778) revolutionized biology by inventing the system of taxonomy we still use today, he created a nested hierarchy showing all living forms as related, classifying them by species, genus, family (order), class, and kingdom. This didn't mean Linnaeus read natural evolution into his biological hierarchy; like almost any other scientist of his day, he saw the hierarchy as the materialization of a divine plan.

This view changed when Darwin, in 1859, published *On the Origin of Species*. Within Darwin's lifetime – perhaps only two decades after *Origin* was published – almost the only way a scientist could think and still be respected was as a natural evolutionist. This does not mean Darwin's ideas went uncontested. Many leading scientists of his day found evolution unconvincing. But the tide in favor of the theory was so strong that even Harvard professor Louis Agassiz, one of the nineteenth century's most stalwart natural scientists, fell practically into obscurity because of his opposition to Darwinian thought.

In the words of biologist Francisco Ayala, former president of the American Association for the Advancement of Science:

> Darwin's greatest accomplishment was to show that the complex order and function in living creatures can be explained as a result of a natural process – natural selection – without having to refer to a Creator or some other external factor.[2]

British zoologist Richard Dawkins put the matter more bluntly: "Darwin made it possible to be an intellectually fulfilled atheist."[3]

Of course, whether creating atheists was Darwin's actual intent is uncertain, even unlikely. At least in *Origin*, he only argued that the numerous species of living organisms need not have been created separately but could have emerged naturally, on their own, over eons, from one or a few simple and original life forms ("I view all beings not as special creations, but as the lineal descendants of some few beings which lived long before the first bed of the Silurian system was deposited."[4]).

Nevertheless, after Darwin the role of any intelligent agent such as God was pushed so much into the background that for all practical purposes He ceased to exist for the world of biology and for science in general. It was soon taken for granted that if life could have evolved into complex forms on its own, then life itself could have started without any intelligent agent.

Darwin's proposal caught on wildly, and in its wake it ushered in a modern era of materialism, or naturalism – the idea that material nature and the universe are closed, self-contained units and that to explain anything within them, including our selves, our feelings, our thoughts, and our consciousness, we need refer to nothing beyond the laws that govern matter, the laws of physics and chemistry.

But in spite of the widespread acceptance of Darwinism and its attendant materialism, Darwin's theory has always had its scientific critics, and their number has not decreased. Rather, and to the surprise of many, the criticism has greatly increased. Since the late 1980s, evolution has faced opposition from a growing number of members of the scientific community itself. This opposition has gradually united into an Intelligent Design front and pulled the world of science into what has been called "the Evolution War."

What Intelligent Design (ID) entails will be explained in the chapters to follow. But for now let me give a simple definition: Intelligent Design is the theory that infers signs of intelligence from the workings of nature. What this means becomes clearer if for a moment we turn to the field of archeology. Archeologists study discovered objects, such as flints, and ask the question whether everything about these objects can be explained naturally or whether, on the contrary, certain traits are the result of intentional work by humans. When archeologists determine that a discovered object could not have been shaped by natural processes alone, they infer design and regard the object as a human artifact. Similarly, ID is the attempt by scientists to draw a line between what could have been caused by nature working alone and what could not have and must therefore have been caused by an intelligent agent.

What makes ID controversial is not that it tries to discriminate

between designed and naturally formed objects per se, since this goes on not only in archeology but in many fields of science, but that contemporary design-theorists look for and claim to have found signs of intelligence in nature and life. Living organisms, they say, have features that cannot be ascribed to the laws of nature alone but are best explained as artifacts of an intelligent cause. Of course, this at once puts ID in opposition to Darwinism and evolutionary theory, which precisely claim that everything about life can be explained materially.

This explains why the face-off between evolutionists and proponents of Intelligent Design creates such a stir. Critics accuse ID of being veiled religion, whereas design theorists retort that ID is no more a religion than Darwinism – or perhaps only just as much. ID scientists say that since they demonstrate their conclusions entirely from studies of nature and not by recourse to religious concepts or scripture, ID cannot be called "religion" in any usual sense of the term. But if Intelligent Design should be called religious because it has religious implications – which everyone agrees it has – then Darwinism is also religious. The only difference between the two is that Intelligent Design points to an intelligent cause behind nature whereas Darwinism purports to show that an intelligent cause for life and nature is not necessary. Perhaps the real fact is that, whether one likes it or not, the discussion about the nature of life invariably overlaps both science and religion.

What science has to say about the nature of life has implications for more than just an elite group of experts. The question of life's origin and development influences every human being's self-understanding and indeed lies at the foundation of how we each build ideas of what is true and false, right and wrong, important and unimportant, and about the meaning of existence. This may be one more reason why this issue causes so much stir.

In this book, assisted by Jonathan Wells, Michael Behe, William Dembski, and Michael Cremo, I first offer the reader an understanding of what Darwinism and Intelligent Design are. Next, while agreeing with the basic ideas of Intelligent Design, I go one step further by examining evidence normally not a direct part of the Intelligent Design

discussion – in particular, studies of consciousness, parapsychological phenomena, inspiration, and evidence pointing to a conscious self that can exist apart from matter. Some may consider this a risky step, but upon examination one finds much high-quality scientific evidence in this field that opens a window on a nonphysical yet still observable reality. This, of course, can have great implications for how we understand the nature of life.

Finally, in the book's last chapter, I try to weave all these disparate strands of evidence together into a whole. Evidence never stands alone in science; it must be interpreted into a broader theoretical framework, often called a paradigm. For most modern biologists, the guiding paradigm is Darwin's theory of evolution. In the words of evolutionary biologist Theodosius Dobzhansky (1900–1975), "Nothing in biology makes sense except in the light of evolution" and "There are no alternatives to evolution as history that can withstand critical examination."[5] In this book's last chapter, I take up Dobzhansky's challenge and propose such an alternative.

As I have said, I have drawn my paradigm from the *Vedas,*[6] the ancient Sanskrit writings of Hindu India. From the viewpoint of modern science, the Vedic literature, apart from its philosophical content, records some astonishingly accurate details about the universe. Astrophysicist Carl Sagan (1934–1996) noted in his book *Cosmos:*

> The Hindu religion is the only one of the world's great faiths dedicated to the idea that the Cosmos itself undergoes an immense, indeed an infinite, number of deaths and rebirths. It is the only religion in which the time scales correspond to those of modern scientific cosmology. Its cycles run from our ordinary day and night to a day and night of Brahma, 8.64 billion years long. Longer than the age of the Earth or the Sun and about half the time since the Big Bang.[7]

Of course, that the ages of the Earth and the universe given in the Vedic literature roughly coincide with the figures discovered by modern

science is something Sagan considered accidental. But is it? My own feeling is that at least we should consider whether there may be more to the Vedic literature than meets the eye.

While there are numerous schools of Vedic thought, I have chosen to draw inspiration from one: the Gaudiya Vaishnava teachings given by the prominent Vedic scholar A. C. Bhaktivedanta Swami Prabhupada (1896–1977), founder and preceptor of the International Society for Krishna Consciousness. Prabhupada wrote more than fifty books on Vedic culture. Educated at a British college in Calcutta during the British raj, he was also familiar with Western science and philosophy. In his work discussing thirty-five prominent Western philosophers, he accepted Darwin to have been the most influential on modern thought. His critique of Darwinism, given in a series of conversations with Dr. Thoudam Singh, a chemist and student of Nobel laureate Harold Urey,[8] was published in 1976 in a much circulated book titled *Life Comes From Life*.

To form a meeting place for Vedic philosophy and modern science, Prabhupada established a research center known as the Bhaktivedanta Institute, with its main branch in Mumbai, India. In the years since his death, researchers associated with the Bhaktivedanta Institute have published numerous books and papers on modern science and Vedic thought, many of which have dealt specifically with Darwin's theories. This book is a footnote to their effort.

In conclusion, I owe gratitude to many for contributing to this book. First, I again have to express my deep and heartfelt thanks to Jonathan Wells, Michael Behe, and William Dembski. Although both they and I know they do not agree with everything in my Vedic presentation, they broadmindedly agreed to contribute to this book. I thank Michael Cremo, who not only wrote the chapter "Human Origins and the Archeological Record" but also served as a close advisor while I was writing and gave many valuable suggestions. Several scientists have reviewed and critiqued the manuscript in full or in part during its writing. In particular, biologist Dr. Gerald Bergmann of Northwest State College, Ohio, USA, reviewed the entire manuscript midways. Among others who similarly

helped were Denyse O'Leary, Phillip Johnson, Walter ReMine, Günther Momsen, Arne Kiilerich, and Krishna Kripa Dasa. My thanks are to all of them. The responsibility for whatever shortcomings remain in the book despite their careful scrutiny and advice is my own.

Many others have also made significant contributions. I thank Kaisori Bellach for her untiring work of editing, and Brahma Muhurta Dasa for being a visionary publisher willing to undertake this publication. Jayadvaita Swami and Ksama Dasi deserve special mention for their editing and proofreading. Krishna Kripa also worked on the notes and the bibliography. I thank Ramaprasada Dasa for his work on the illustrations, and Govinda Dasa for the design and layout. Finally, my deep gratitude to my wife, Dandaniti Devi Dasi, for her encouragement and patience during the writing of this book.

Leif Asmark Jensen (Lalitanatha Dasa)

CHAPTER 1

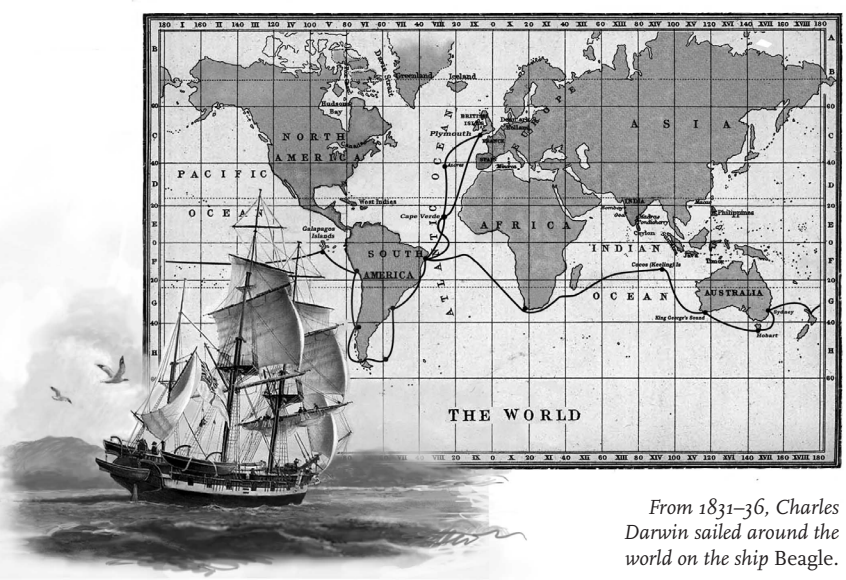
The Origin of Species

Even though Darwin's ideas were considered revolutionary in Victorian England, natural evolution was no novel concept when in 1859 he published *On the Origin of Species*. Some philosophers and scientists of the eighteenth and nineteenth centuries had already been toying with the idea that species were not stable – that is, that they could change and, over time, become new species. Scientists like the French naturalist Jean-Baptiste Lamarck (1744–1829) and Charles Darwin's grandfather, Erasmus Darwin (1731–1802), had been exploring the idea for years. However, no one had been able to convincingly suggest a natural mechanism that could be driving evolution, and so natural evolution had remained a fringe idea.

Apparently, Darwin was not an adherent of evolution (or what it implies) in his younger years. Rather, at least according to official biographies, he was a strong believer in the Bible, trained in Christian theology. As he later described, "I did not then in the least doubt the strict and literal truth of every word in the Bible."[1] And according to the Bible, creation had taken place just a few thousands – and not millions – of years earlier, when over a period of six days God had created each species – each type of plant, animal, and human being – separately.

Darwin is supposed to have changed his outlook, however, while undertaking a five-year voyage (1831–1836) to some of the remotest corners of earth as a naturalist aboard the HMS Beagle. His travels took him to the bottom of South America and to the windswept shores of the Galapagos Islands in the Pacific Ocean, 970 kilometers off the coast of Ecuador. There he encountered much that didn't fit his understanding of Biblical creation. He saw geological wonders – volcanoes and rock strata – that pointed to an earth much older than the six thousand years the Bible allowed. Of course, he had already encountered the idea that the earth was more ancient than he had previously supposed when he read British geologist Charles Lyell's *Principles of Geology,* the first volume of which was published just a year before Darwin set out. In *Principles* Lyell proposed that the earth's geological structure was a result not of a recent creation but of slow natural forces operating almost invisibly over millions and millions of years. Darwin felt what he saw on his voyage confirmed Lyell's hypothesis.

Aside from geological questions, Darwin also found himself puzzled



From 1831–36, Charles Darwin sailed around the world on the ship Beagle.

by the geographical distribution of species. That the Galapagos alone hosted many distinct yet obviously related species of plants and animals scattered over a few small islands sowed in his mind the seeds of the idea of organic evolution. He wrote in his journal, "It is the circumstance, that several of the islands possess their own species of the tortoise, mocking-thrush, finches, and numerous plants, these species having the same general habits, occupying analogous situations, and obviously filling the same place in the natural economy of this archipelago, that strikes me with wonder."[2]

If species had been created separately, then why had God created different yet very similar species for each of the small islands, the smallest of which were, in Darwin's words, barely more than "points of rock"? It would have made more sense if completely different species inhabited each island. This phenomenon, something Darwin began to notice everywhere he traveled, led him to think that perhaps the species had not been created separately at all but had evolved from a common ancestor in the distant past.

When Darwin returned to England in 1836 he continued to ponder the issue and gradually became convinced of organic evolution. In 1844 he wrote a friend, "At last gleams of light have come, and I am almost convinced (quite contrary to the opinion I started with) that species are not (it is like confessing a murder) immutable."[3]

As other naturalists of Darwin's time also observed the geographical distribution of species, they too became convinced of evolution. One such naturalist was Alfred Russel Wallace (1823–1913), a young correspondent of Darwin's who now and then sent Darwin plant and animal specimens from his travels in Borneo. Wallace shares with Darwin the honor of having proposed the theory of evolution, because while Darwin had written down his thoughts privately, he had never published his theory. Wallace had found the time to spell out his ideas on evolution through natural selection while he was bedridden with malaria in Borneo. He detailed his thoughts in a paper he sent to Darwin, asking him to send on both the letter and the paper to Charles Lyell, whom Wallace did not know. It is said that Darwin was dismayed

to receive Wallace's paper[4] – Darwin had been quietly working on the same ideas for twenty years by this time. Now the younger Wallace was about to receive credit for the theory Darwin considered his own. Of course, there were differences between Darwin's conception and Wallace's conception. Darwin had focused on the uniqueness of species and Wallace on the driving force of natural selection. But both had drawn their ideas from Malthus's paper on population economics. When Darwin mentioned Wallace's letter to Charles Lyell, Lyell encouraged him to copublish the theory with Wallace. Wallace readily agreed to share the spotlight, and on July 1, 1858, their joint paper was presented to the Linnean Society of London. This was the official birth of the theory of evolution through natural selection.

The theory drew little notice at first – it was only one of several papers read at the Linnean Society that summer – but it came more into the light a year later when, on November 22, Darwin published *On the Origin of Species*. The book was an overnight bestseller and somewhat eclipsed Wallace's role in the theory's development. From then on, the theory of evolution has been almost exclusively attributed to Charles Darwin.

What made Darwin's and Wallace's theory unique was that it proposed what appeared to be a plausible natural mechanism to account for how the numerous species scattered over the earth had come about: they had evolved from a common ancestor by the processes of variation and natural selection. As mentioned previously, others had long ago presented ideas about evolution, but no one had yet presented a plausible driving mechanism. Lamarck, for example, had proposed that evolution was fueled by a nebulous vital force or inner urge common to all living organisms. Darwin and Wallace, however, confined their theory to "variation" and "natural selection" as sufficient mechanisms to create variety in life.

Darwin's theory can be summarized in a few words: Every species contains variations among individuals in terms of size, ability, color, pattern, etc., and some of these differences prove advantageous for an organism in its competiton for survival with other members of the

same species. Individuals with advantageous traits live longer and produce more offspring than those without them. When these more adept individuals reproduce, they pass on their advantageous traits to their offspring; concomittantly, the less adept fail to pass on their less advantageous traits because they often fail to survive long enough to reproduce, or they manage to produce significantly fewer offspring than more favored individuals. Gradually, the species comes to contain *only* individuals with the advantageous traits; those traits that disadvantage the species become extinct. This process of "natural selection" causes a species to develop in particular directions and can eventually lead to the development of a new species.

To support the idea of natural selection, Darwin relied heavily, in his research, on the artificial breeding of plants and animals. We only have to look around the agricultural world to see how breeding for specific traits can appear to change one species almost entirely. Breeding dogs has resulted in both Great Danes and poodles, with every conceivable variety in between. Darwin was himself an expert breeder of pigeons and argued that if man can cause sweeping changes in a species through artificial selection after only a few generations, then nature must have been able to accomplish incredible feats after eons. He felt it was conceivable that anything could happen through natural selection, including that humans and all other species could gradually develop from previously existing species, which themselves had evolved from other species, which had developed in their ancient histories from the simplest of microbes.

The Downfall of Darwinism

Darwin's theory is undoubtedly simple and elegant. But is it true? This, of course, was the central question during Darwin's lifetime, and it remains the central question to this day. Considering the enormous impact Darwin's theory has had over the last 150 years, many people may be surprised to learn that within decades of its being proposed scientists had come to see that it was obviously *not* true. Today, virtually no serious scientist believes in Darwin's theory as he proposed it.

Rather, they have come to believe in some form of neo-Darwinism, a later development that agrees with Darwin on only two points: that evolution from a common ancestor took place and that it occurred through natural processes alone.

To make the difference between Darwinism and neo-Darwinism clear, it is useful to look at what was wrong with Darwin's original theory. This will also allow us to see how some people, including certain biologists, unwittingly cling to some of the ideas that have otherwise been rejected for well over a century.

Varieties and Species

The standard definition of a species for sexually-reproducing organisms requires that members of the same species can mate and create fertile offspring. If two organisms engage in sex and cannot produce offspring capable of further propagation of their own species, the two organisms belong to different species. Darwin agreed with this definition.[5]

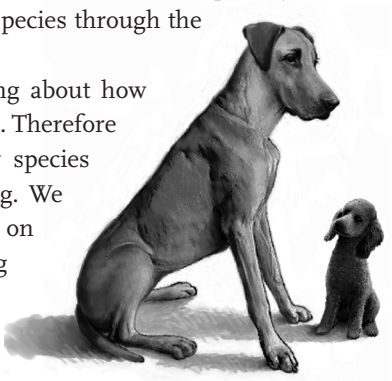
Taxonomy teaches us that species are divided into varieties, also known as races or sorts. However, varieties, unlike species, do not have strong demarcations between them; that is, they can crossbreed freely and produce fertile offspring. Their offspring will still belong to their species even if the crossbreeding produces a new variety. The various races of humans are an example of the effect of crossbreeding. All humans, regardless of race (variety), can propagate and produce fertile offspring.

The crux of Darwin's argument is that *varieties can gradually become species through breeding*. In other words, he believed that the changes that appear in the varieties within a species can be extended unlimitedly:

> Nevertheless, according to my view, varieties are species in the process of formation, or are, as I have called them, incipient species. How, then, does the lesser difference between varieties become augmented into the greater difference between species? That this does habitually happen we must infer from most of the innumerable species throughout nature presenting well-

> marked differences; whereas varieties, the supposed prototypes and parents of future well-marked species, present slight and ill-defined differences.[6]

In short, Darwin believed that plant and animal breeding can give rise to new species. The first chapter in *Origin*, "Variation Under Domestication," examines the effect human-directed breeding has on a species. Although he doesn't state it outright, Darwin implies that if given enough time and enough crossbreeding, species could be bred until they become a new species. In his second chapter, "Variation Under Nature," Darwin argues that nature also has the capability to breed varieties until they become new species through the process of natural selection.



Even though of all kinds of sizes, from Great Danes to tiny poodles, varieties of dogs always remain dogs and never become new species through breeding.

As it turned out, Darwin was wrong about how much change actually occurs in varieties. Therefore he was also wrong to think that new species could arise given enough crossbreeding. We now know that nature has placed limits on how far a species can change. Breeding can affect differences only in preexisting characteristics. For example, by breeding dogs one can produce dogs of different sizes, temperaments, or hair length and color. But whether short or tall, the dogs remain dogs. It is not possible to breed for characteristics that are not already present in dogs. We will never be able to produce a cat by breeding dogs, even if we breed through many generations. Breeding simply shuffles and recombines already existing traits.

We have also discovered that there are limits even on how much one can enhance or suppress the inherent characteristics. The American botanist and plant breeder Luther Burbank (1849–1926) stated:

> I know from experience that I can develop a plum half an inch

> long or one two-and-a-half inches long, with every possible length in between, but I am willing to admit that it is hopeless to try to get a plum the size of a small pea, or one as big as a grapefruit. I have roses that bloom pretty steadily for six months of the year, but I have none that will bloom twelve, and I will not have. In short, there are limits to the development possible.[7]

The noted French zoologist Pierre Grassé (1895–1985) agreed:

> In spite of the intense pressure generated by artificial selection (eliminating any parent not answering the criteria of choice) over whole millennia, no new species are born. A comparative study of sera, hemoglobins, blood proteins, interfertility, etc., proves that the strains remain within the same specific definition. This is not a matter of opinion or subjective classification, but a measurable reality. The fact is that selection gives tangible form to and gathers together all the varieties a genome is capable of producing, but does not constitute an innovative evolutionary process.[8]

In 1982, Francis Hitching wrote similarly about selective breeding:

> It is now absolutely clear that there are firm natural limits to what can be done. Remarkable achievements can be made by crossbreeding and selection inside the species barrier, or within a larger circle of closely related species, such as wheats. But wheat is still wheat, and not, for instance, grapefruit. Between 1800 and 1878, the sugar content of beets was raised from 6 to 17 per cent. A half century of further breeding failed to make any difference."[9]

All this was not only demonstrated in the years following Darwin; before and during his time biologists had already been correctly observed that there were limits to the changes one could effect through breeding.

Darwin's notion that varieties could turn into species was wishful thinking and not based on actual evidence.

Pangenesis – The Inheritance of Acquired Traits

The other thing Darwin got wrong was the mechanism of inheritance, and this soon became obvious as the science of genetics advanced. While he conceded his ignorance ("The laws governing inheritance are quite unknown"[10]), he still made assumptions about how they worked. It was later shown that they didn't work in the way he had thought.

Natural selection alone is not enough to create a new species. Natural selection cannot create; it can only eliminate. The French scientist Hugo de Vries pointed out that natural selection may explain the *survival* of the fittest but not the *arrival* of the fittest.[11] Even more important than natural selection is the appearance of favorable variations. As Darwin himself noted, "…unless profitable variations do occur, natural selection can do nothing."[12] For example, there could be no breeding of new dog races if all dogs were born completely identical. Natural selection has to have some variation to select from in order for evolution to take place.

Darwin believed that the variation needed for his theory was provided by external influences on the organisms. He believed that food and environment effect and change the organisms as do how organisms use – or not use – their organs. These affected changes would then be passed on through the generations. Darwin wrote,

> The great and inherited development of the udders in cows and goats in countries where they are habitually milked, in comparison with the state of these organs in other countries, is another instance of the effect of use [that causes changes in the organisms].[13]

And,

> From the facts alluded to in the first chapter, I think there can be little doubt that use in our domestic animals strengthens and

> enlarges certain parts, and disuse diminishes them; and that such modifications are inherited.[14]

Darwin also thought that experience (external influences) and the traits acquired through experience affected the "reproductive elements," the semen and egg cells. This is why these traits were passed on in new variations. He writes, "But I am strongly inclined to suspect that the most frequent cause of variability may be attributed to the male and female reproductive elements having been affected prior to the act of conception."[15]

Darwin was wrong in assuming that either environment or natural selection create new characteristics.

Darwin shared this idea with Lamarck, who had suggested that giraffes who stretch their necks to eat the leaves other giraffes cannot reach develop longer necks and in turn produce calves with longer necks. However, all these ideas are now known to be incorrect. Acquired traits are not inherited. We may lift weights until we develop muscles like steel, but our children will not be born with larger muscles. In some cultures where women enhance their beauty by enlarging their lips or earlobes, their daughters are not born with bigger lips or earlobes than girls in any other culture. It is not true that cows develop larger udders when milked and pass this trait to their calves, or that a species exposed to the cold develops fur, fat layers, and a higher metabolism and adds these traits into its genetic makeup to be passed on to its offspring. Darwin was wrong in assuming that either environment or natural selection create new characteristics. Natural selection simply eliminates those individuals that don't have the favorable traits already.

Just when Darwin was publishing *Origin* Gregor Mendel (1822–1884), an Austrian monk living in the Augustinian monastery of Brno, was studying the laws of inheritance. Mendel is an exemplar of both a deeply religious man and a staunch scientist. In his research he performed extensive experiments crossing different varieties of plants and

noting how their characteristics were passed from one generation to the next. Especially well known are his experiments with peas.

Mendel's research demonstrated anything but the evolution that Darwin envisioned. Mendel observed no genetic changes in species over the generations. In 1866, only seven years after Darwin had published his book, Mendel published his treatise *Versuche über Pflanzenhybriden* (*Experiments on Plant Hybridization*), in which he introduced "the laws of constant elements." The word "constant" appeared in his paper sixty-seven times – "constant characters," "constant offspring," "constant combinations," "constant forms," "constant law," "a constant species," etc. Mendel concludes that heredity involves a transmission of constant factors that determine an organism's traits. Although the factors can be mixed and matched during reproduction, they remain discrete and unchanging from one generation to the next.[16]

The laws of inheritance Mendel discovered were opposite to the laws Darwin had assumed. A simple way to understand the difference between the two views is to think of a deck of cards. By shuffling the deck, one can combine the cards in quite a large number of ways, but no new cards will arise in the process. This was Mendel's correct view of inheritance. Darwin, on the other hand, incorrectly imagined that new cards, i.e., previously non-existing traits, could arise by shuffling the cards around. Jonathan Wells explains it like this:

> [Darwin] believed that every cell in an organism produces "genmules" that transmit characteristics to the next generation in a blending process he called "pangenesis." The advantage of Darwin's view was that genmules could be changed by external influences, or by use and disuse, and thus account for evolutionary change. The disadvantage of Darwin's view was that it was false.[17]

Although Mendel's paper was published in 1866, it was ignored for decades, perhaps because of its anti-evolutionary implications and Mendel's own opposition to evolution. It wasn't until several years after

his death that his work was appreciated and his laws of inheritance became the cornerstone of modern genetics.

Of course, all this is old news. Mendelian genetics has been firmly established for more than a century. Amazingly, however, one can still meet evolutionary scientists who appeal to Darwin's concept of the inheritance of acquired traits. American biologist Christopher Wills writes,

> The force that seems to have accelerated our brain's growth is a new kind of *stimulant:* language, signs, collective memories – all elements of culture. As our cultures evolved in complexities, so did our brains, which then drove our cultures to still greater complexity. Big and clever brains led to more complex cultures, which in turn led to bigger and cleverer brains.[18] [emphasis added]

Here a biology professor, as late as 1993, is appealing to an external factor, a "stimulant," to explain how a new trait (bigger brains) arose. It is surprising to see the concept of pangenesis still showing up in modern evolutionary thought. One would expect today's biologists to have a better explanation than pangenesis for a complex organ like the human brain.[19]

Darwinism as Dogma

The cornerstones of Darwin's theory are that varieties can evolve into new species and that acquired traits are inherited. The work of Mendel and others refutes both of these. One might ask, Then what happened to the idea of natural evolution? Did scientists revisit the idea that species may have been created separately – or that they may have been created at all? Did they consider the possibility that more than natural mechanisms were operating in nature?

The answer is no to both questions. But to understand why, we need to study the impact Darwinism had not just on science but on society as a whole. From the last decades of the nineteenth century on, Darwinism became as much a worldview as a scientific hypothesis. In his 2007

book *Darwin Day in America,* Dr. John G. West discusses how by the beginning of the twentieth century Darwin's theory had pervaded all of Western society and culture and replaced the more traditional ways of understanding life. This in turn led to many of the socio-political events of the first half of the twentieth century. John West:

> At the dawn of the last century, leading scientists and politicians giddily predicted that modern science—especially Darwinian biology—would supply solutions to all the intractable problems of American society, from crime to poverty to sexual maladjustment. Instead, politics and culture were dehumanized as a new generation of "scientific" experts began treating human beings as little more than animals or machines:
>
> - In criminal justice, these experts denied the existence of free will and proposed replacing punishment with invasive "cures" such as the lobotomy.
> - In the welfare department they proposed eliminating the poor by sterilizing those deemed biologically unfit.
> - In business, they urged the selection of workers based on racist theories of human evolution and the development of advertising methods to more effectively manipulate consumer behavior.
> - In sex education, they advocated creating a new sexual morality based on "normal mammalian behavior," without regard to long-standing ethical or religious imperatives.[20]

Darwinism thus permeated society with far-reaching consequences, and as it did, the theory left the realm of hypothesis and moved into the realm of "established fact," something not to be doubted. It was no longer a question of *whether* evolution had taken place but of how.

A comment made by Wallace is revealing. Wallace later differed with Darwin on a number of points (discussed in chapter 12), including Darwin's idea that evolution was an unguided, natural process. Rather,

he came to see evolution as part of God's great plan to place eternal souls in physical bodies for spiritual evolution.[21] In a 1903 interview, the eighty-year-old Wallace was asked if he thought scientists would become more spiritually minded. His reply reveals his opinion of what Darwinism had done to scientific minds:

> I do [think scientists will become more spiritual], but the process is a very slow one. The attitude of science was probably never more materialistic than now... Spiritual scientific men are very few, and most of them are afraid of revealing their mind. The majority of scientists seem to regard it as a sign of insanity to avow belief in any other than what are called the ordinary laws of nature.[22]

In his 1991 book, *Darwin on Trial,* Berkeley law professor Phillip Johnson explores how the central Darwinian concept of descent with modification from a common ancestor became dogma rather than science and over time stopped being tested as hypotheses are usually tested:

> We can only speculate about the motives that led scientists to accept the concept of common ancestry so uncritically. The triumph of Darwinism clearly contributed to a rise in the prestige of professional scientists, and the idea of automatic progress so fit the spirit of the age that the theory even attracted a surprising amount of support from religious leaders. In any case, scientists did accept the theory before it was rigorously tested, and thereafter used all their authority to convince the public that naturalistic processes are sufficient to produce a human from a bacterium, and a bacterium from a mix of chemicals. Evolutionary science became the search for confirming evidence, and the explaining away of negative evidence.[23]

Johnson illustrates his opinion with an interesting incident. In 1967, the Wistar Institute in Philadedelphia, USA, hosted a conference

called "Mathematical Challenges to the Neo-Darwinian Interpretation of Evolution." At the conference leading mathematicians met with leading evolutionary biologists and argued the statistical impossibility that complex organs, such as the eye, could have evolved by a series of thousands upon thousands of small, random mutations; the number of mutations needed to create a complex eye is simply far too large, and there just hasn't been time in the world's history for these random mutations to have occurred. Instead of acknowledging the problem, however, the biologists accused the mathematicians of "doing science backwards." Evolution, they said, was an established fact; the eye *had* evolved. So the mathematical problems could not be reflecting reality. A leading attendee at the conference, evolutionist Ernst Mayr, said, "Somehow or other by adjusting these figures we will come out all right. We are comforted by the fact that evolution has occurred."[24]

Evolutionists have become so convinced that evolution is a fact and not a theory that at times they have even been unable to clearly distinguish between fact and theory. A prominent spokesperson for evolution in the latter part of the twentieth century, Harvard paleontologist Stephen Jay Gould (1941–2002), once wrote:

> Facts are the world's data. Theories are structures of ideas that explain and interpret facts. Facts do not go away while scientists debate rival theories for explaining them. Einstein's theory of gravity replaced Newton's, but apples did not suspend themselves in midair pending the outcome. And human beings evolved from apelike ancestors whether they did so by Darwin's proposed mechanism or by some other, yet to be identified.[25]

Phillip Johnson notes,

> The analogy is spurious. We observe directly that apples fall when dropped, but we do not observe a common ancestor for modern apes and humans. What we *do* observe is that apes and humans are physically and biochemically more like each other

> than they are like rabbits, snakes, or trees. The apelike common ancestor is a hypothesis in a *theory*, which purports to explain how these greater and lesser similarities came about. The theory is plausible, especially to a philosophical materialist, but it may nonetheless be false. The true explanation for natural relationships may be something much more mysterious.[26]

One can even find examples of evolutionists who are so convinced of evolution that they accidentally cite evidence that actually counters it. Tim Berra is an example of one such evolutionist. In his 1990 book, *Evolution and the Myth of Creationism*, Berra tried to help readers understand why the fossil record establishes descent from a common ancestor. He compared fossils to a series of automobile models: "If you compare a 1953 and a 1954 Corvette, side by side, then a 1954 and a 1955 model, and so on, the descent with modification is overwhelmingly obvious. This is what [paleontologists] do with fossils, *and the evidence is so solid and comprehensive that it cannot be denied by reasonable people*."[27] [emphasis in the original]

Evolution became dogma in Darwin's time and has remained dogma ever since.

Phillip Johnson dubbed this "Berra's blunder" because everyone knows that cars are designed in advance by intelligent designers and that each car is manufactured separately. Their similarity is not the result of an unguided Darwinian process of descent dependent on reproduction. What Berra actually showed is that resemblances between species can be due to design; similarities found in the fossil record might as easily be due to common design as common descent. But because he was so convinced about the "fact" of evolution, he saw even a contradictory example as evidence for evolution.

In short, evolution became dogma in Darwin's time and has remained dogma ever since. Although much could be argued against his proposed mechanisms of evolution, most evolutionary scientists

today refuse to look at the evidence and instead have taken on the task of finding mechanisms to account for what they already accept as fact.

Neo-Darwinism: The Modern Synthesis

Darwinism was dealt a serious blow when it was shown that acquired characteristics could not be inherited. The inheritance of acquired characteristics was then replaced with the idea that mutations must have caused genetic variation. Scientists could see that although inherited characteristics remain stable and unchanging from one generation to the next, on rare occasions there are genetic changes. These changes, originally called "freaks of nature" and later "mutations," became the proposed source of the new genetic material needed for evolution to occur. And with the discovery in the 1950s of the DNA double helix, scientists learned that mutations are caused by random errors taking place when the genetic code, which is stored in the DNA, is copied.

What is now known as Neo-Darwinism, or "the Modern Synthesis," was the result of an attempt by leading biologists between 1936 and 1947 to formulate a theory of biological origins that reconciled Mendelian genetics with Darwin's concept of evolution from a common ancestor. The biologists concluded that organisms evolve due to small changes caused by random mutations "sifted" through natural selection.

Here it must be recognized that the mechanism proposed by the Neo-Darwinians is much weaker than the mechanism originally proposed by Charles Darwin. Darwin's mechanism of acquired traits is almost deterministic in nature. If food is scarce for long enough and the only way to survive is to stretch your neck and consume what no other member of your species can reach, then over the generations, your descendants will certainly develop a longer neck and become long-necked giraffes. But to achieve the same result through random mutation is a different story. The number of random mutations required to evolve a long neck do not happen simply because long necks are advantageous at any given moment. Since the mutations are random, they may or may not occur, and most likely they will *not* occur at the moment when they have the best chance of being useful.

Random mutations, we now know, account for very few novel and favorable traits, even though this mutation idea has been widely accepted for almost a century. That mutations occur is not at issue. What is in doubt is how they advantage an organism, since most mutations have been shown to be either neutral (having no effect) or detrimental. The medical libraries are full of books listing mutations and the harmful conditions and diseases they cause, but the literature rarely reveals examples of mutations benefiting organisms.

In fact, almost the only examples given of beneficial mutations are those that make bacteria resistant to antibiotics. Other examples address how the mutation that causes sickle-cell anemia – a mutation that kills 25 percent of its human hosts – also provides resistance to malaria. Thus in spite of a 25 percent mortality rate from sickle-cell disease, those possessing this mutation in malaria-infected areas have a greater chance of surviving malaria than those who do not.

In his 2007 book *The Edge of Evolution* Michael Behe asks how much mutations can actually achieve. He tries to answer this question by exploring a number of cases, some in which evolution did occur and some in which it did not. Take malaria, for example. Malaria has killed an amazing number of humans in recorded history, yet although the malaria parasite has been around for tens of thousands of years, it can live only in the tropics. Malarial parasites cannot reproduce in temperatures below 16 degrees Celsius. An obvious question: Why hasn't this parasite evolved the ability to tolerate lower temperatures and thus enabled itself to spread to colder climates? Certainly it has had plenty of opportunity to do so because, as Behe points out, with its staggering reproductive capacity and short generation time there have been more malarial parasites on earth in the last ten thousand years than mammals in the last two hundred million years.

But as it turns out, if the malarial parasite is to adapt to lower temperatures, multiple coherent genetic mutations would be needed – more mutations than one can expect to take place randomly and concurrently. Behe concludes, through this and other examples, that if more than one mutation is needed for an organism to evolve, Darwinian evolution

begins to become improbable; the more mutations needed, the more exponential the decrease in probability that Darwinian processes will be able to achieve a particular system.

Thus although neo-Darwinism has been in vogue for more than a century, no satisfactory mechanism exists to account for how evolution occurs. This was further seen when, in 2008, the Konrad Lorenz Institute in Austria invited the world's leading theoretical biologists to a conference called "Toward an Extended Evolutionary Synthesis." The organizers explained themselves in their invitation:

> The challenge seems clear to us: how do we make sense, conceptually, of the astounding advances in biology since the 1940s, when the [Modern Synthesis] was taking shape? Not only have we witnessed the molecular revolution, from the discovery of the structure of DNA to the genomic era, we are also grappling with the increasing feeling that we just don't have the theoretical and analytical tools necessary to make sense of the bewildering diversity and complexity of living organisms.[28]

Could it be clearer? Evolutionists today seem to have an "increasing feeling" that they don't have the "theoretical tools" to explain "the bewildering diversity and complexity of living organisms."

The Search for Speciation

Not only is there no satisfactory mechanism to account for how new species appear, but speciation (the forming of new species) has never been observed. As was true in Darwin's day, variations within a species are readily observed, but "evolution" beyond variations is still hypothetical. Still, one can find some who contest this assessment. Whole lists have been posted on the internet of instances of speciation, often drawn from prominent scientists' statements.[29] But without exception all these examples deal with variations within particular species and not with speciation.[30]

Darwin's finches are one commonly cited example of supposed

speciation. The Galapagos Islands are located almost a thousand kilometers off the coast of Ecuador. There one finds a number of finch species called Darwin's finches. When Darwin first visited these islands he paid little attention to these birds. Later, however, it was seen that although they vary in size and color, the finches all appear to have originated from a single strain, birds that probably migrated from somewhere on the American continent and thus provide an excellent example of Darwinian evolution.

Yet although the finches appear to have a common ancestor, they are not a true instance of speciation because when they mate they produce fertile offspring. Some of the species actually appear to be remerging. In other words, the finches offer an example not of speciation but of variation within a species.[31]

Another oft cited example is the herring gull. The herring gull and the lesser black-backed gull form what is known as a "ring species." These birds appear in Europe as two separate species, but if one were to follow the herring gull east through Russia and Siberia into North America, Greenland, Iceland, and back to Europe, one would see that the herring gull gradually becomes more and more like the lesser black-backed gull. The evidence is strong that they have branched out from one ancestral gull species, and especially in Europe that they have become two species that do not interbreed.

Yet it turns out that they are *able* to breed and produce fertile offspring. What keeps them from doing so is not biological inability but a difference in behavior. Again, this is not an example of true speciation but another variation within a species.[32]

The herring gull and the lesser black-backed gull form what is known as a "ring species."

To sum up, bacteriologist Alan H. Linton writes,

> [Nothing] exists in the literature claiming that one species has been shown to evolve into another. Bacteria, the simplest form of independent life, are ideal for this kind of study, with generation times of twenty to thirty minutes, and populations achieved after eighteen hours. But throughout 150 years of the science of bacteriology, there is no evidence that one species of bacteria has changed into another... Since there is no evidence for species changes between the simplest forms of unicellular life, it is not surprising that there is no evidence for evolution from prokaryotic to eukaryotic cells, let alone throughout the whole array of higher muliticellular organisms.[33]

In 2002, evolutionary biologists Lynn Margulis and Dorion Sagan echoed Linton:

> Speciation, whether in the remote Galapagos, in the laboratory cages of the drosophilosophers, or in the crowded sediments of the paleontologists, still has never been traced.[34]

The theory of evolution, whether in Darwin's original formulation or in the formulation of neo-Darwinism, still lacks an evidential confirmation. The origin of species is as much a mystery today as it was when Darwin published his book 150 years ago.

If we have never witnessed the formation of new species, what do evolutionists have to offer in support of their theory? In the chapter that follows, biologist Jonathan Wells takes a close look at some of the most often cited evidences of evolution.