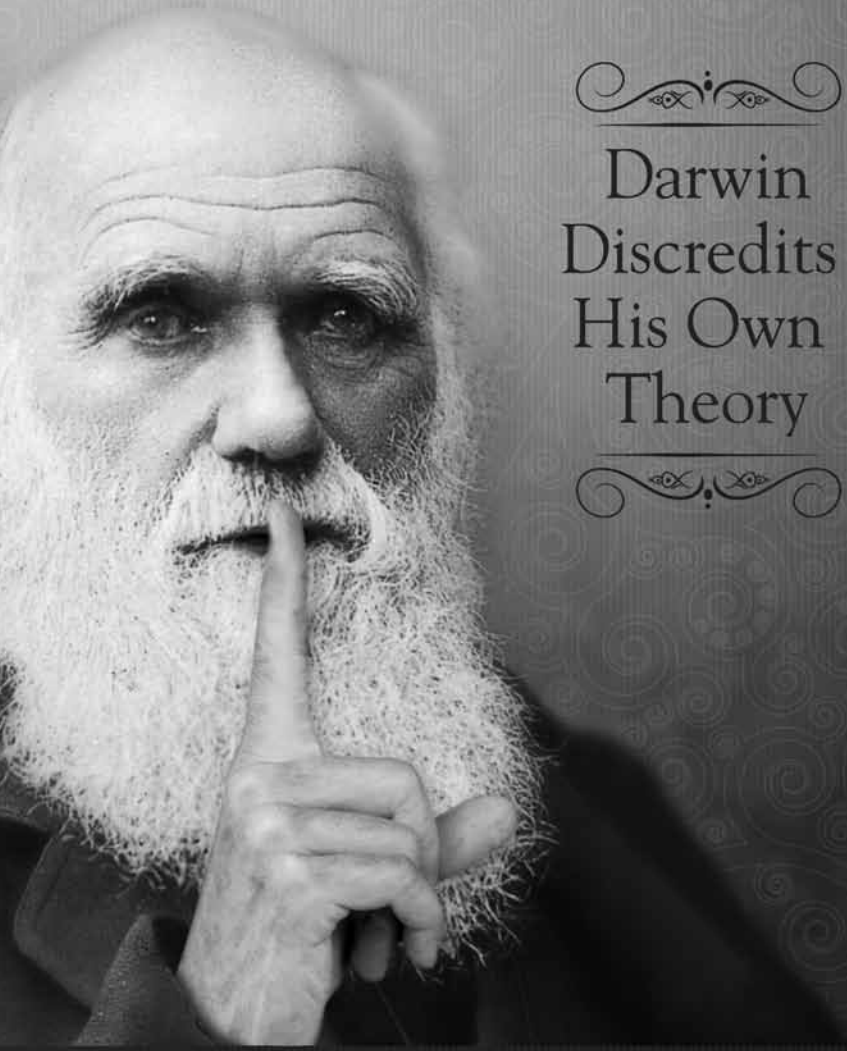
Secrets of the Sixth Edition



Darwin Discredits His Own Theory

RANDALL HEDTKE

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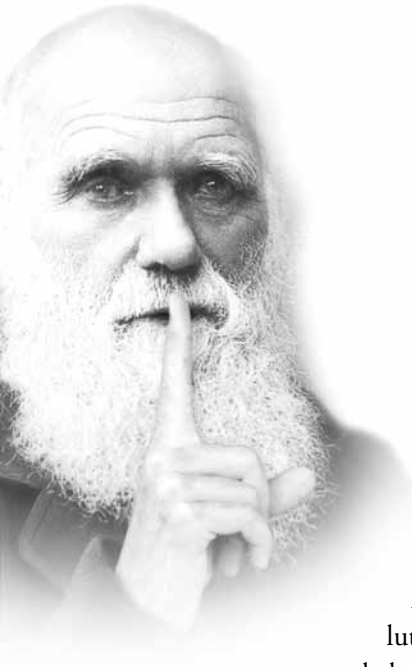
Evolution is purported to be a scientific theory; therefore, all teachers have an unassailable right to question the evidence in the classroom. Not only an exalted right but a common sense expectation, and an invulnerable obligation to students and the science.

— Randall Hedtke



Foreword

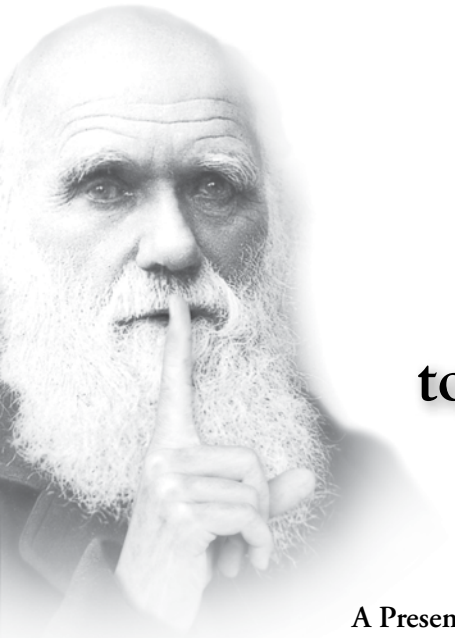
What is the secret of the sixth edition of *On the Origin of Species*? Incredibly, Charles Darwin, in his old age, abandoned natural selection, the mechanism by which evolution was believed possible. The reader may well ask how something of that significance could have remained a secret for so long when the sixth and last edition of the *Origin* was published in1872. The primary reason why Darwin's secret had not previously been revealed to the public may simply be because few people bother to read the *Origin*. The book is probably one of the most-quoted or paraphrased, but least read books in the world. The *Origin* is seldom read for two reasons. First, Darwin's writing style was wordy, repetitious, and vague; consequently, few people have the mental stamina or desire to read the book from the beginning to the end. Second, there is little reason why anyone would want to read the *Origin*, since the basic concept of natural selection, or survival of the fittest, is explained in just a few sentences in most high school or college textbooks. I dare say that a survey of the general public or even of high school or university biology instructors would reveal a very low percentage who have actually read the sixth edition or any other edition of the *Origin*.

The larger question as to why Darwin abandoned natural selection, a hypothesis that is often placed on a par with Newtonian physics

or Einstein's relativity, requires an intimate understanding of Darwin himself. It has been over ten years since I discovered, while studying the *Origin*, that Darwin had, inconceivably, abandoned his life's work. It was precisely because it was so inconceivable that Darwin would abandon natural selection that the knowledge languished in my mind and in my notebook for so long. I had, in the interim, occupied my spare time by researching and publishing other aspects of evolutionary views. It was not until reading two recently published books about Darwin's illness, which I had previously understood to be hypochondria but which is revealed in the books to be an anxiety-caused psychoneurosis, that I had reason for what had formerly seemed so unreasonable. The first investigation, *Secrets of the Sixth Edition*, provides evidence and the reasons why Darwin abandoned natural selection. The following investigations pertain to other closely related aspects of his hypothesis.

The last chapter, "The Principle of Applied Creation in an Origins Curriculum," describes the curriculum strategy that I developed and have taught for many years. The curriculum avoids the civil rights problem of separation of church and state. On the other hand, the curriculum does restore a basic human right formerly missing in the evolution curriculum, namely the right of every student to learn about alternative points of view or, as I described it in the essay, freedom of thought. On this point the code of ethics of the education profession adopted by the National Education Association is quite clear: "In fulfillment of the obligation to the student, the educator shall not unreasonably deny the student access to varying points of view." I am sure everyone in education would agree that is a commendable obligation to students. The concept of creation in the curriculum is used in a secular way to fulfill that obligation. Conversely, evolutionary theorists wish to have the scientific evidence for the origin of life interpreted exclusively from an evolutionary point of view. That being the case, the controversy is basically between the evolutionary theorist's scientific *modus operandi* and the education profession's code of ethics. My experience has taught me that freedom of thought prevails over any scientific *modus operandi*.

Finally, I hope the reader will excuse some repetition that was allowed to remain in the essays, taking into consideration that they were written over a period of 11 years and deal with overlapping subject matter.



Chapter I

An Introduction to the Evolutionary Hypothesis

A Presentation of the Founders

It is only natural that in any drama, and the evolution controversy certainly is one, the principal players should be introduced at the outset. These consist of Charles Darwin, the author of the controversial view of the origin of life, and those who were in frequent and personal contact with him, his lieutenants, as one author called them.

Charles Darwin (1809–1882)

Charles was the son of Robert, a successful country physician whose father, Erasmus, grandfather to Charles, also had a successful medical practice. Erasmus had, during his lifetime, gained considerable recognition for his writings in the area of organic evolution, and it is his ideas that form the foundation for Charles's book *On the Origin of Species* published in 1859.

Charles attended Edinburgh and Cambridge without being attracted to any particular profession. He did not wish to follow in his father's and grandfather's footsteps as a physician, since for one thing, he had discovered that the dissecting of cadavers made him ill. At one time, he entertained the thought of entering the ministry and devoting his spare time to science, which is what he may have done had an

uncle not arranged a position for him aboard the sailing ship *Beagle* on a government-sponsored exploration voyage. During the five-year voyage, Charles, the ship's naturalist, kept copious notes on his observations and collected and preserved numerous specimens. One of his first accomplishments shortly after his return to England was to publish a journal of the voyage and a description of the many specimens.

In 1839 Charles married a cousin, Emma Wedgewood. They resided in London for about two years and then bought a house near the village of Down about 15 miles from London. It was while living in London that Charles chose his life's occupation, which was to continue his grandfather's work on evolutionary ideas. Having an adequate inheritance, he retired to Down, and his life thereafter was characterized by a single-minded devotion to the cause of evolution, as this excerpt from his autobiography indicates:

> Few persons can have lived a more retired life than we have done. Besides short visits to the houses of the relations, and occasionally to the seaside or elsewhere, we have gone nowhere. During the first part of our residence we went a little into society, and received a few friends; but my health almost always suffered from the excitement, violent shivering and vomiting attacks being thus brought on. I have, therefore, been compelled for many years to give up all dinner parties; and this has been somewhat a deprivation to me, as such parties always put me into high spirits. From the same cause I have been able to invite here very few scientific acquaintances. My chief enjoyment and sole employment throughout life has been scientific work; and the excitement from such work makes me, for the time, forget, or drives right away my daily discomfort. I have, therefore, nothing to record during the rest of life except the publication of my several books.[1]

Nearly all of the publications to which he refers were written for the express purpose of enhancing the credibility of the hypothesis contained in the *Origin.* Although Charles enjoyed robust health during his youth and while aboard the *Beagle,* symptoms of a psychoneurosis began to appear shortly after his marriage. The illness continued throughout most of his life, with Emma becoming much

like a nurse and mother, not only to Charles but to the ten children she raised.

Alfred R. Wallace (1823–1913)

A.R. Wallace was a self-made naturalist whose limited formal schooling was compensated by unlimited interest and enthusiasm. He traveled widely and endured numerous hardships in his zeal to collect specimens, which he studied and sold. Like so many others in his day, he too was preoccupied with the idea of discovering a materialistic explanation for the origin of life. In January 1858, on the small unexplored island of Ternate, while ill with a fever, the natural selection hypothesis suddenly occurred to him.

> One day something brought to my recollection Malthus's *Principle of Population*, which I had read about twelve years before. I thought of his clear exposition of "the positive checks to increase" — disease, accidents, war, and famine. . . . It then occurred to me that these causes or their equivalents are continually acting in the case of animals also. . . . Vaguely thinking over the enormous and constant destruction which this implied, it occurred to me to ask the question, "Why do some die and some live?" And the answer was clearly that on the whole the best fitted lived. . . . Then suddenly it flashed upon me that this self-acting process would necessarily *improve the race* because in every generation the inferior would inevitably be killed off and the superior would remain — that is, *the fittest would survive.*[2]

As soon as the fever left him, Wallace spent a few days developing the hypothesis in more detail and sent it off to Darwin. Much to his disappointment, Darwin read a hypothesis almost identical to the one he had been working on for some 20 years and at first assumed that priority for it would go to Wallace. Darwin's priority, though, was established by an 1844 sketch that he had written, and in 1859, about a year after receiving Wallace's paper, Darwin published the *Origin,* but A.R. Wallace's name had become inseparably linked to Darwin.

Sir Joseph Dalton Hooker (1817–1911)

Joseph Hooker was one of Darwin's oldest and perhaps closest friends, confiding in him as early as 1844 about his endeavor to formulate

a credible hypothesis of evolution for the origin of life. Hooker's specialty was in the area of plant taxonomy, and during his career he contributed to scientific publications for many years. In 1865 he succeeded his father as director of Kew Gardens, a position that he held for many years. The other founders of evolutionary views were acquaintances of Darwin through a mutual interest in the view, but Hooker's relationship to Darwin seemed to have been one of genuine friendship.

Sir Charles Lyell (1797–1875)

Lyell was originally trained as a lawyer but found his true vocation as a geologist. He was both Darwin's mentor and his most frustratingly recalcitrant follower. In 1831 he published *Principles of Geology,* which had the distinction of establishing the concept of uniformitarian geology as opposed to what was then in vogue*:* catastrophic geology. According to uniformitarian geology, all of the geologic features of the earth's crust came into being by continuous processes presently operating. One can see, then, that the uplifting of a mountain range or the excavation of a Grand Canyon would take an exceedingly long time. Catastrophic geology, on the other hand, would postulate that mountain ranges were uplifted in the past by extraordinary forces not presently operating or that the Grand Canyon was excavated by a much greater volume of water before the sediment had solidified into sedimentary rock, consequently requiring a much shorter period of time.

Lyell's *Principles* was one of the books that Darwin had with him while aboard the *Beagle*. Evolutionary views and uniformitarian geology fit hand in glove; one enhances the credibility of the other. There can be no Darwinian evolution within the short time frame of catastrophic geology. Uniformitarian geology has the potential to push the age of the earth back to infinity, consequently creating a time frame long enough for Darwin's alleged organic evolution to take place.

Incredibly, Lyell was not an evolutionist. His thinking in regard to living things was not consistent with the continuous-processes thesis of uniformitarian geology. For the creation and extinction of living things, he called upon catastrophic or miraculous forces. Lyell's uniformitarian geology, with its extended time frame, cleared the way for evolutionary views, yet evolution was personally unacceptable to him. Perhaps for these reasons Darwin regarded Lyell as his barometer for

success; if Lyell could be converted, then he could rest content. Darwin seemed to need the approval of Lyell in order to still his own doubts about his views. When Hooker suggested that Lyell was reacting favorably to the hypothesis, Darwin immediately wrote a letter of joy and relief to Lyell: "I rejoice profoundly; for, thinking of so many cases of men persuing an illusion for years . . . I have asked myself whether I may not have devoted my life to a phantasy."[3]

Darwin's joy was premature. Although he kept hinting that he would, Lyell never announced his conversion. Nevertheless, this did not prevent him from promoting Darwin's hypothesis. Since it enhanced his own geology views, he had a professional, vested interest for doing so.

Asa Gray (1810–1888)

Gray originally trained as a physician but found his niche as the leading American botanist at Harvard. If Lyell was recalcitrant, Gray was downright rebellious by comparison. Gray had been groomed by Darwin before the *Origin* was published to spread the word of his hypothesis in the United States. Gray faithfully performed this duty

He arranged for the publication of the *Origin,* defended it against criticism, and wrote favorable reviews. Like Huxley and Lyell, Gray performed the duties that Darwin desired, yet held serious reservations about the hypothesis.

In his book of essays on evolutionary views entitled *Darwiniana*, he consistently urged those who would reject it not to be hasty, and those who would accept it, not to do so prematurely. In regard to natural selection, Darwin's alleged mechanism for evolution, Gray states: "We believe that species vary and that 'natural selection' works; but we suspect that its operation, like every analogous natural operation, may be limited by something else."[4] In other words, he was denying Darwin's thesis that nature could select variations that would accumulate into new species.

Gray eventually had a falling-out with Darwin over the question of design. Gray could look around and see evidence of design in nature indicating to him the result of intelligence, not chance. Would Darwin base his views on theism or atheism? Darwin chose atheism, and with that decision Gray could no longer count himself among Darwin's inner circle of friends, although an apparently cordial relationship did continue.

Thomas Henry Huxley (1825–1895)

T.H. Huxley was in his day what we would today describe as an antiestablishment leader. He was an immensely popular fellow with an inexhaustible amount of energy and ambition that he directed not only against the religious establishment (he coined the word agnosticism) but against any social and educational inequities that came to his attention.

Were he alive today, he would certainly have become an ally in the feminist movement. He pioneered in the area of women's rights in higher education and against archaic laws that discriminated against them. He possessed a complete disregard for traditions or social mores that in his opinion favored the establishment at the expense of the masses. At one time his daughter Ethel wished to marry the widower of her deceased sister, Marion. There was a law in England at the time against marriages of this sort, and in protest to the law and in sympathy for his daughter, he took her to Norway where the marriage was consummated.

Something of Huxley's character is revealed in his personal letters, which frequently contained warlike similes directed against the opposition. Bibby describes the estimation others had of Huxley's ability and intellect.

> Wallace experienced in his presence a feeling of awe and inferiority which neither Darwin or Lyell produced; both Darwin and Hooker declared that in comparison with Huxley they felt quite infantile in intellect. And it was not a narrow or merely scholastic sort of intellect; it was many-dimensioned and as effective in practical affairs as in abstract reasoning. As a modern American writer has perhaps too colorfully put it, "Huxley had more talents than two lifetimes could have developed. He could think, draw, speak, write, inspire, lead, negotiate, and wage multifarious war against earth and heaven with the cool professional ease of an acrobat supporting nine people on his shoulders at once."[5]

All of this energy, ability, and intelligence was directed at making a name for himself. To his sister he wrote:

> I will leave my mark somewhere, and it shall be clear and distinct: T.H.H., his mark, and free from the abominable blur

> of cant, humbug, and self-seeking which surrounds everything in this present world — that is to say, supposing that I am not already unconsciously tainted myself, a result of which I have a morbid dread.[6]

It is no wonder that the reclusive Darwin was overjoyed when Huxley found favor with his hypothesis and agreed to publicly defend it. It is no wonder, also, that Huxley should be attracted to evolutionary views as a weapon against established religion, which was anathema to him.

Huxley's scientific credentials were mainly in the area of comparative anatomy and taxonomy. He defended the hypothesis enthusiastically, albeit with some very important reservations that perhaps were not consistently and fairly expressed to his constituents.

It is ironic that the mark that Huxley achieved should be most popularly recognized as that of "Darwin's bulldog," a subordinate position to a man of lesser talents. Huxley is said to have enjoyed the luxuries of genius while Darwin possessed the bare essentials.

St. George Mivart (1827–1900)

St. George Mivart, an English biologist, was, like Lyell, educated for the bar but devoted himself to the biological sciences. Although an evolutionist of sorts, he was not a supporter of Darwin's natural selection mechanism. It was Mivart's criticisms to which Darwin responded in the sixth edition of the *Origin.* These criticisms forced concessions from Darwin that were tantamount to abandoning his natural selection mechanism, the warp and woof of evolutionary views.

The Social Darwinists

Last but by no means least, we cannot forget the social Darwinists, perhaps the most forceful of all the champions of the hypothesis. Their enthusiasm for evolutionary views were only surpassed by their ignorance about its finer points. These were the numerous writers of Darwin's day and after who possessed the mental capability to somehow make the connection that any kind of *change* — social, political, personality, or whatever — was evidence that organic change was possible. With their constant literary references to evolutionary views, they succeeded in making it a public fad while the question of its validity became passé. It was not the scientific accuracy of evolutionary theory

that appealed to their minds, but the philosophy behind it that held them in rapture. Evolution scientists owe more than they admit to the social Darwinists and their "evolutionism."

Historical Background

No student of evolutionary views can claim to understand Darwin and the phenomenal acceptance of his hypothesis without taking into consideration the cultural times in which his book, *On the Origin of Species,* was published.

Well over 100 years ago, when the industrial or scientific revolution was new and in full swing, a handful of dedicated men were able to convince much of Western civilization that life had originated from some primordial soup in the oceans and continued to evolve into the great diversity of life that we see today, guided by little more than chance gene mutations acted upon by natural selection.

This was no small accomplishment and would have been doomed to failure like all of the previous attempts to formulate a materialistic explanation for origins had it not been for the opportune times in which the *Origin* was published. The success factor was not the invincible evidence or the soundness of the hypothesis, but the utopian dream of a new world wrought by science. This dream that nearly everyone shared placed the public in an ingenuous frame of mind. Were not evolutionary views delivered to us under the auspices of science? Are not scientists the great benefactors of our time? Is not the scientific method infallible? Seldom in the history of mankind had the power and prestige of a fraternal group risen so rapidly and to such dizzying heights as that of the scientific community. Macaulay, a noted British historian, exemplifies the public attitude of his time.

> Macaulay was full of admiration for the scientific revolution he was witnessing in the early 19th century, and in this, as in so many things, he typified his age. For him as for others, then and now, "science" meant only partly empiricism, a method of looking at data. More immediately, more tangibly, "science" meant the secondary results of that method: the products of technology. During the long reign of Queen Victoria, "science" transformed many of the conditions of people's lives. The first railroad was built in England in 1825 when

> Victoria was a little girl; before that, the maximum speed of land travel was, for up-to-date Englishmen as it had been for Caesars and Pharaohs, the speed of the horse. But before the queen and empress died, almost all of Britain's now existing railroads had been built; "science" had begun that liberation of man from animal muscle, that acceleration toward inconceivable velocities which is so characteristic of our own age and is still as impressive to us as it was to the Victorians.
>
> Impressive: "science" was *doing* things, making things *work*. The practical, empirical, positivistic British temperament was fascinated. While Victoria occupied the throne, transatlantic steamship service was begun; power-driven machines revolutionized industry; the telegraph became a practical instrument and the telephone was developed; the electric lamp and the automobile were produced. Eight years before the *Origin*, the Victorians celebrated *Progress* at the first world's fair in the fabulous Crystal Palace where Macaulay felt as reverent as at St. Peter's. "Science" was making things happen; it could predict their occurrence; its success precluded doubt. It seemed to many at the time final and unambiguous. One could depend on it.[7]

Evolutionary views arose by science and by science it must stand or fall, and yet it soon happened that the hypothesis became instead a popular ethical, social, and philosophical concept that permeated nearly every aspect of Western culture.

> Persuasive because "science" was persuasive, evolution became a watchword to the late Victorians. By the end of the century, hardly a field of thought remained unfertilized by the new concept. Historians had begun looking at the past as a "living organism"; legal theorists studied the law as a developing social institution; critics examined the evolution of literary types; anthropologists and sociologists invoked natural selection in their studies of social forms; apologists for the wealthy showed how the poor are the unfit and how progress under the leadership of the fit was inevitable; novelists "observed" their creatures as they evolved in an "empirical" way; and poets hymned a creative lifeforce.[8]

The social Darwinists had become an unexpected and powerful ally to the evolutionary movement. The social, ethical, and philosophical selling points propogated by the proponents of evolutionary views and enforced by the Victorians' overriding awe of science became the chief defenses for the evolutionary hypothesis. Indeed, the Victorians followed Darwin blindly. The evolutionist philosophers were soon on the offensive. Who would dare to question their interpretation of the evidence? Some theologians dared, but they were dismissed as religious bigots. After all, are not scientists paragons of objectivity? George Bernard Shaw candidly states:

> Never in history, as far as we know, had there been such a determined, richly subsidized, politically organized attempt to persuade the human race that all progress, all prosperity, all salvation, individual and social, depend on an unrestrained conflict for food and money, on the suppression and elimination of the weak by the strong, on free trade, free contract, free competition, natural liberty, laissez-faire: in short, on "doing the other fellow down" with impunity.[9]

Charles S. Pierce arrived at a similar conclusion that Darwin's hypothesis was nowhere near to be proved, but its favorable reception "was plainly owing, in large measure, to its ideas being those toward which the age was favorably disposed, especially, because of the encouragement it gave to the greed-philosophy."[10] The hypothesis had become, to a large degree, removed from accountability to the scientific community that had produced it.

Darwin's Obsession with His Book

Charles Darwin's writing career produced several books and papers in addition to his principal work, *On the Origin of Species,* which introduced his hypothesis of evolution. All of his other works, such as *The Descent of Man*, are subsidiaries to the *Origin*. Considering that he spent half of his entire lifetime writing and rewriting the *Origin*, the book was more than his major writing effort — it was his life's obsession. For example, he began earnestly taking notes in 1837, after his return from the exploration voyage aboard the *Beagle*, which put his age at 28. The first edition of the *Origin* was published in 1859 when

he was 50, and the sixth and last revised edition was published in 1872 when he was 63. He died in 1882 at the age of 73. The actual span of time that he spent periodically writing and rewriting the *Origin* was approximately 36 years — half of his entire lifetime.

Many of the changes made in the *Origin* are what appear to be pointless word changes that do not improve the sentence structure nor change the meaning of a statement. On the other hand, some revisions are made that change the entire significance of the original statement. As an example, consider the following sentence from the first edition.

> Yet in North America there are woodpeckers which feed largely on fruit, and others with elongated wings which chase insects on the wing; and on the plains of La Plata, where not a tree grows, there is a woodpecker, which in every essential part of its organization, even in its colouring, in the harsh tone of its voice, and undulatory flight, told me plainly of its close blood-relationship to our common species; yet it is a woodpecker which never climbs a tree.[11]

The purpose of describing the woodpecker was to point out to the reader that he had discovered a bird with woodpecker characteristics that does not live as a woodpecker. This purpose becomes untenable as the revisions proceed. By the time the sixth edition is published and all of the concessions are made and embellishments added, we discover that *Colaptes campestris* is after all a rather ordinary woodpecker.

> Yet in North America there are woodpeckers that feed largely on fruit, and others with elongated wings which chase insects on the wing. On the plains of La Plata, where hardly a tree grows [in the fifth edition, he conceded that some trees do grow in the area], there is a woodpecker *(Colaptes capestris)* which has two toes before and two behind, a long pointed tongue, pointed tailfeathers, sufficiently stiff to support the bird in a vertical position on a post, but not so stiff as in the typical woodpecker, and a straight strong beak. The beak, however, is not so straight or strong enough to bore into wood; and I mention, as another illustration of the varied habits of the tribe, that a Mexican *Colaptes* had been described by De Saussure as boring into hard wood in order to lay up a store

> of acorns for its future consumption! ["Into hard wood" is changed in the fifth edition to read "into wood" because if the beaks are not as straight or strong as a typical woodpecker, then how can they bore into hard wood? Finally, everything from the last semicolon is removed from the sixth edition.] Hence this *Colaptes* in all the essential parts of its structure is a woodpecker. Even in such trifling characters as the colouring, the harsh tone of its voice, and undulatory flight, its close blood-relationship to our common woodpecker is plainly declared; yet, as I can assert, not only from my own observations, but from those of the accurate Azara [local inhabitants], in certain large districts it does not climb trees, and it makes its nest in holes in banks! [Now he has conceded that the bird does climb trees in some districts.] In certain other districts, however, this same woodpecker, as Mr. Hudson states, frequents trees, and bores holes in the trunk for its nest. [Now we learn that the bird is able to nest in the holes that it is capable of boring.][12]

The reader will note how Darwin attempted to make something significant for evolutionary hypothesis out of *Colaptes campestris*. He was attempting to persuade the reader that he had discovered a bird that was evolving to become a woodpecker. For example, it has stiff tail feathers, but not as stiff as a typical woodpecker; it has a strong beak, but not as strong as a typical woodpecker; it does not climb trees. But in the end, over a span of about 13 years and five editions, it is conceded that there are some trees in La Plata, the bird can climb them, bore holes in them, and nest in them. I have quoted mostly from the first and sixth editions; altogether, it requires an entire page to record the revisions and additions made between the first and sixth editions without repeating original text.

"Of the 3,878 sentences in the first edition, nearly 3,000, about 75 percent, were rewritten from one to five times each."[13] Most of the revisions seem to be nothing more than worrisome tinkering. If one realizes that his hypothesis is not provable by any scientific test and that he himself viewed the book as "one long argument," the tinkering becomes understandable. The thought that may well have been the cause of his obsession with the wording in the *Origin* was the specter

that, being an argument, others could argue against it, and being non-provable, it could possibly be subject to disproof. Because the book is essentially an argument, it is inherently biased. The bias lies in the fact that he was arguing for a materialistic explanation for the origin of life, which would complement the new materialism of the age. That being the case, it is obvious that he was not likely to look at any evidence from a creation point of view, since it was that point of view that he was arguing against. This is in contrast to an honest-to-goodness scientific investigation that would attempt to prove how life arose, per se, rather than attempting *a priori* to prove that it arose materialistically.

Eventually Darwin's argument resulted in five revised editions and "over 1,500 sentences being added, and of the original sentences, plus these, nearly 325 were dropped. Of the original and added sentences there were nearly 7,500 variants of all kinds. In terms of net added sentences, the sixth edition is nearly a third as long again as the first."[14] Even spread out over many years, it was a tremendous effort that must have consumed a great deal of time and energy. It also affected his health and was the main cause of his psychoneurosis. One can imagine the daily tension plaguing someone who has written an argument concerning a very controversial issue and the constant concern as to how long his arguments would stand the test of time. Would someone eventually advance a decisive argument against it? Would someone conduct a conclusive test against the hypothesis?

The Technique of Covert Intimidation

The psychology involved in Darwin's method of persuasion is the highlight of the *Origin.* It is the writing style and his unique presentation of evidence, not the "scientific-ness" of the hypothesis, that is the persuasive factor. The skeptical reader is generally mentally unprepared to untangle arguments as intricately woven as those in the *Origin*. One is also confronted with imagination extensively applied, and the critic, thinking in terms of reality, is left with the only recourse, silence, if not acceptance. Even the mechanics of sentence structure, such as the frequent use of semicolons, seem to conspire against the reader. Quite often the essence of a sentence or sentences is difficult or impossible to discover. For example, consider this quote from the *Origin* and comments by Samuel Butler.

> "In the earlier editions of this work I underrated, as now seems probable, the frequency and importance of modifications due to spontaneous variability. But it is impossible to attribute to *this cause* [i.e., spontaneous variability, which is itself only an expression for unknown causes] the innumerable structures which are so well adapted to the habits of life of each species. I can no more believe in this [i.e., that the innumerable structures, etc., can be due to unknown causes] than the well adapted form of a racehorse or greyhound, which, before the principle of selection by man was well understood, excited so much surprise in the minds of the older naturalists, can thus [i.e., by attributing them to unknown causes] be explained."
>
> It is impossible to believe that after years of reflection upon his subject, Mr. Darwin should have written as above, especially in such a place, if his mind was clear about his own position. Immediately after the admission of a certain amount of miscalculation there comes a more or less exculpatory sentence, which sounds so right that ninety-nine people out of a hundred would walk through it, unless led by some exigency of their own position to examine it closely, but which yet, upon examination, proves to be as nearly meaningless as a sentence can be.[15]

Darwin often confuses the reader by making an assertion and then obscuring it by qualifying it or appearing to renege. Generally, Darwin followed the rule of using a maximum number of words to establish a minimum number of concepts or ideas, rather than the other way around. Consequently, not everyone has the patience or the mental stamina to read the *Origin* cover to cover. The persuasive, argumentative nature of the *Origin* is described in the reaction of John Stuart Mill.

> His first reaction to the book was genuine astonishment that so much could have been done with so fantastic an idea. Darwin had not proved the truth of his hypothesis, but he had proved that it might be true, which Mill took to be "as great a triumph as knowledge and ingenuity could possibly achieve on such a question." Nothing can be at first sight more entirely unplausible than his hypothesis, and yet after beginning by thinking it impossible, one arrives at something like an actual