The Theory that Changed the World:

Charles Darwin and His Influence on Church History

Great men and women of history leave the world a changed place when they die. Few people in history have changed the world as significantly as Charles Darwin. His theory of evolution by means of natural selection, published in 1859 in *On the Origin of Species*, fundamentally altered the course of scientific progress and shook the foundations of Christian theology. By explaining the life sciences with natural law, Darwin completed the scientific revolution begun by Copernicus in 1543—the whole of science had been decisively separated from theology.

Darwin was born February 12, 1809 to Dr. Robert and Susanna Darwin. His mother died when he was eight, and he was subsequently raised by his sisters. Even at eight years old, Charles developed a fondness for collecting and studying nature that was to serve him well in his career.[1] The next year, he went to a boarding school and stayed there seven years. Although living at the school, his family lived nearby, and he was therefore able to spend time at home, "keeping up home affections and interests."[2] While at boarding school, Darwin learned the importance of experimental science by assisting his brother in self-directed chemistry experiments.[3]

Charles began attending Edinburgh University in 1825 in order to study medicine. He found the lectures there dull and much preferred to study by reading. In his second year at the university, he cultivated friendships with several other students, and together they developed

1 C. R. Darwin, *The autobiography of Charles Darwin 1809-1882. With the original omissions restored. Edited and with appendix and notes by his grand-daughter Nora Barlow*, (London: Collins, 1958) 22
2 Darwin 25
3 Darwin 46

a love of natural history. Darwin spent time outside of class attending lectures on geology and zoology, reading and writing papers on natural science, and studying marine animals.[4]

After studying for two years in Edinburgh, Darwin's father, a doctor himself, perceived that Charles did not want to be a physician and suggested to him that he become a clergyman. Although initially reluctant to embrace the dogma of the Anglican church, Charles nevertheless fully accepted the creed of the church before enrolling in divinity school. In his autobiography, he writes, "I did not then in the least doubt the strict and literal truth of every word in the Bible."[5] In order to prepare for the clergy, Darwin entered Christ's College at Cambridge University in 1828. While at Cambridge, Charles developed tastes in art and music and spent a great deal of time riding, shooting, and hunting. Although he later felt ashamed of spending much of his time thus occupied, he writes that he "cannot help looking back to these times with much pleasure."[6]

Darwin also invested time at Cambridge developing his aptitude in natural science. He thoroughly enjoyed a pastime of collecting and cataloguing beetles. Charles developed friendships with several professors at Cambridge, including a Professor Henslow. Through these relationships, Darwin continued studying and discussing natural science. After completing his final examination at Cambridge, Henslow persuaded Darwin to stay and study geology. Charles spent the year of 1831 touring the English countryside studying the natural history of the land he encountered. Upon his return to Cambridge, Henslow informed Charles of the open position of naturalist on board the *Beagle* for its voyage around the world. Although initially reluctant to allow his son to go, Darwin's father was persuaded. Charles

4 Darwin 49-53
5 Darwin 57
6 Darwin 60

writes, "The voyage of the *Beagle* has been by far the most important event in my life and has determined my whole career…"[7]

Darwin spent five years on board the *Beagle*. His primary tasks were to study the geology of the land and to collect and catalogue the various species he encountered. He recorded his thoughts and findings in his journals and sent them home to England whenever possible. While on his journey, Charles learned to judiciously apply his time and resources to efficiently accomplish the task at hand.[8] Although he loved the work as a naturalist on the *Beagle*, he was ambitious to do such work to "take a fair place among scientific men."[9]

After returning to England in 1836, Darwin devoted himself to writing and further expanding the work that was begun on the *Beagle*. It was during this period that he fully developed the theory of evolution by means of natural selection. Charles married in 1839 to Emma Wedgewood. Echoing the thoughts all married men have had, he writes, "I marvel at my good fortune that she, so infinitely my superior in every single moral quality, consented to be my wife."[10] Charles and Emma had ten children, three of whom died at a young age.

Charles Darwin spent the remainder of his life developing his theories, writing them in books, and studying the world around him. He died in 1882 and is buried in Westminster Abby.

Before more specifically addressing Darwin's theory of natural selection and discussing its effect on theology and the church, it will be helpful to understand Darwin's own personal religious beliefs.

Darwin's father, greatly admired by his son, was not especially religious—a curious

7 Darwin 76
8 Darwin 78
9 Darwin 81
10 Darwin 97

fact considering that it was Darwin's father who suggested that Charles become a clergyman. The elder Darwin's goal, however, was not pious. Rather, he knew that as a clergyman his son would have a steady, guaranteed income for life. Although he was not raised to be particularly religious, Darwin did, as mentioned earlier, accept the full thirty-nine articles of faith of the Anglican church. In the two years after his voyage on the *Beagle*, Charles spent much time thinking about religion, and "[he] gradually came to disbelieve in Christianity as a divine revelation."[11] Darwin writes in his autobiography:

> But I found it more and more difficult, with free scope given to my imagination, to invent evidence which would suffice to convince me. Thus disbelief crept over me at a very slow rate, but was at last complete. The rate was so slow that I felt no distress, and have never since doubted even for a single second that my conclusion was correct. I can indeed hardly see how anyone ought to wish Christianity to be true; for if so the plain language of the text seems to show that the men who do not believe, and this would include my Father, Brother and almost all my best friends, will be everlastingly punished. And this is a damnable doctrine.[12]

Although he rejected Christianity, he did not entirely reject the concept of the divine. Again in his autobiography he reflects on the origin of all things and surmises that this First Cause may in fact possess human-like intelligence.[13] However, acknowledging the inherent unknowability of the divine, he writes, "…I for one must be content to remain an Agnostic."[14]

In 1859, Charles Darwin published *On the Origin of Species*, in which he presented his theory of evolution by means of natural selection. This theory, often referred to as darwinian evolution or, simply, darwinism, accompanied with its implications, fundamentally changed the relationship between the church and science. Darwin's theory completed the Scientific Revolution started by Copernicus. Copernicus explained the motion of the heavens in terms of

11 Darwin 86
12 Darwin 86-87
13 Darwin 92-93
14 Darwin 94

itself using natural law rather than theological premise. Darwin's theory completed this revolution by explaining the life sciences (including the diversity of species, the problem of suffering, and the relation between species) by means of natural law. Darwin proposed that all variation in species can be explained as an accumulation of small changes over time, each of which offered an increased likelihood of allowing that species to successfully mate and produce offspring. The current understanding of evolution in 1859 was that each species was static, created in a very similar form to what is seen now, and individuals within a species could be treated as a homogenous group. Darwin's new idea proposed that all life was interrelated, species arose from similar ancestors, and individuals of a species needed to be treated independently rather that as part of a homogenous whole.[15]

Darwin's work was not revolutionary in that it proposed a natural theory. Natural explanations predate Darwin, and new scientific theories in the mid-nineteenth century were expected to have natural explanations.[16] Nor is Darwin's theory unique in that it caused conflict with the church. Conflicts between scientists and the church predate Darwin by hundreds of years. Natural selection was not controversial in its social context. Evolution as a process of improvement over time (a somewhat mistaken interpretation of Darwin's theory) fit perfectly well with the mindset of Victorian society.[17]

Darwinian evolution is revolutionary in that it completely removed the divine from scientific explanations. When it was published, it was the final split between science and theology. Previous to Darwin, scientific ideas eventually came to rest on theology to explain

15 Darwin did not understand the mechanism of inherited characteristics, which we know today to be DNA. Gregor Mendel's work in genetics was published in 1866 and largely ignored until 1900.

16 Frederick Gregory. "The Impact of Darwinian Evolution on Protestant Theology in the Nineteenth Century." *God and Nature*. Ed. David C. Lindberg and Ronald L. Numbers (Berkeley, CA: University of California Press, 1986) 371

17 Gregory 379

the world. After Darwin, science was solely concerned with natural law and explanations to describe the universe. Both theology and science concerned themselves with their own explanations of the universe; there was such polarization of thought on both sides that little substantive debate occurred and all flow of ideas between the two was effectively shut off.[18]

Before Darwin published *Origin*, natural theology "gave to the Christian believer evidence from nature that stood on the same plane as evidence from Scripture…[and] gave to the naturalist…a reasonable hypothesis for the observed distinctness in kinds of organisms.… God could thus be cited as the author of harmony in nature."[19] According to Ernst Mayr, Darwin's theory has given six contributions to modern thought. First, natural selection is a rejection of supernatural phenomena and causations. Second, darwinian evolution is a rejection of typology and an adoption of the perspective of populations as varied individuals, which Mayr says is essential to counter racism. Third, Darwin made teleology unnecessary. There is no final purpose in evolution, just undirected selection. Fourth, nature is nondeterministic and requires study by probabilities. Fifth, Darwin provides a new view of humanity. Mankind's origins are not special, but, by virtue of his intelligence, ethics, and language, his current position in nature is unique. Finally, natural selection provides a scientific foundation for ethics. Behavior in an individual that is individually harmful but good for the group is selected. These ideas, taken together, "places our fate squarely in our own evolved hands."[20]

Because the Christian church was dealing with many internal struggles in the mid-

18 A. Hunter Dupree. "Christianity and the Scientific Community in the Age of Darwin." *God and Nature*. Ed. David C. Lindberg and Ronald L. Numbers. (Berkeley, CA: University of California Press, 1986) 361-362

19 Dupree 354-355

20 Ernst Mayr. "Darwin's Influence on Modern Thought." *University of Hamburg Botany Online*. 25 Oct. 2008 <http://www.biologie.uni-hamburg.de/b-online/e36_2/darwin_influence.htm>.

nineteenth century, it was slow to respond to the threat posed by darwinism.[21] However, the theory did face early opposition. Louis Agassiz rejected darwinian evolution and supported creationism on scientific grounds.[22] As an opponent of Darwin, Agassiz became popular with the American Protestants. Asa Gray, on the other hand, accepted darwinian evolution and maintained that the theory does not conflict with religion or theology.[23] The church as a whole had varied responses to Darwin's theory of natural selection. The Catholic church took issue with some implications of the theory but generally accepted it. Moderate and liberal Protestants merged evolution into their theology in various degrees. Conservative Protestants responded to Darwin with a negative theology.

The Catholic church was reluctant to become involved in another scientific debate similar to the one with Galileo, therefore there was not as much public condemnation as attempts to persuade authors to retract their ideas.[24] In 1860, a provincial council convened in Cologne, Germany and discussed evolution. It provided the most explicit statement on evolution given by the Catholic church in the nineteenth century. The council

> …did not condemn an evolutionary origin outright, but only opposed those who asserted that this evolutionary process had taken place *without the assistance of divine action.* On the contrary, there would be no problem in accepting evolution so long as one recognized simultaneously the necessity of divine participation for the process to take place, in such a way that the secondary causes might join with continuous divine action in giving being and activity to all organisms.[25]

Rome was against the idea that humans are just improved animals. Tradition is authoritative in the Catholic church, and scriptural literalism was never part of that tradition. Therefore the

21 Gregory 372-374
22 Dupree 358
23 Dupree 360
24 Mariano Artigas, Thomas F. Glick, and Rafael A. Martinez. *Negotiating Darwin.* (Baltimore, MD: The John Hopkins University Press, 2006) 6
25 Artigas 23

question of the literal accuracy of Genesis was never an important question.[26] The Roman authorities rejected evolution as applied to humans and limited themselves to acting on the denunciations that reached them.[27]

Six cases of the Roman church's response to publications reconciling evolution and theology serve to illustrate its position.[28] Raffaello Caverni, an Italian priest, proposed a reconciliation of evolution with Catholic doctrine in an 1877 book. This book was formally censured by the church, yet no reasons were given for the censure. In the second case, a French Dominican Dalmace Leroy published a favorable reconciliation of evolution and Catholic doctrine in 1891. This work was not censured, but Leroy retracted his work after threats of censure were made. John Zahm, an American priest, published a book on science and religion in 1896 that, although opposed by Rome, was never formally censured. Geremia Bonomelli, an Italian bishop, praised Zahm's view on evolution, yet later retracted his comments after discovering that the church opposed his position. John Hedley, a Benedictine bishop, also praised Zahm's books. Hedley later published a letter that was mistaken for a retraction. Finally, the sixth case is that of St. George Mivart, an English biologist, who, in an 1871 book, claimed that evolution and Christian doctrine had no conflict. Later Mivart was refused sacraments in the church because of an argument attributed to his views on evolution. The response to these six cases was not based on any formal Catholic policy with respect to evolution.[29] The interesting point is that no proactive intervention was necessary by the church because nineteenth century Catholic theologians were virtually unanimous in

26 Peter J Bowler. *Monkey Trials and Gorilla Sermons* (Cambridge, MA: Harvard University Press, 2007) 179
27 Artigas 277
28 Artigas 16-18
29 Artigas 270

opposition to evolution. However, this more severe view softened in the twentieth century.[30] The important point for the Catholic church is the question of the divine creation of the soul rather than the origin of the physical body.

The Protestant acceptance of Darwin's theory began as a response to the hostile reaction evolution received from conservative churchmen.[31] Those who recognized the progress of science and were convinced that "[a]ny theology…will be moribund and doomed if it does not incorporate [Darwinian evolution] into its very bloodstream."[32] Protestant theology incorporated evolution in one of three ways: importing evolution into theology, reformulating Christian doctrine, or making evolution itself a cornerstone of theology.

The first response, importing evolution into theology, can be seen in the writings of A. H. Strong and James McCosh. Strong, president of Rochester Theological Seminary, viewed evolution as the means of divine intelligence.[33] Strong's views differed from the negative conservative viewpoint in that, rather than rejecting evolution outright, he acknowledged the evolutionary origins of humans.[34] McCosh, "the first well-known American religious leader to make an accommodation with Darwin,"[35] accepted evolution and saw it as the agent of divine design.[36] Far from seeing natural selection as the enemy of divine providence, McCosh viewed the evolutionary process as the final result of supernatural design.[37] By importing evolution into theology, Strong and McCosh both stated that God works primarily through natural law,

30 Artigas 279-280
31 Gregory 378
32 Arthur Peacocke. "Biology and a Theology of Evolution." *Religion and the Challenges of Science*. Ed. William Sweet and Richard Feist. (Burlington, VT: Ashgate Publishing 2007) 75
33 Gregory 379
34 Gregory 380
35 J. David Hoeveler. *The Evolutionists: American Thinkers Confront Charles Darwin, 1860-1920*. (Lanham, MD: Rowman & Littlefield Publishers, Inc. 2007) 78
36 Hoeveler 96-98
37 Gregory 380

including miracles. God remains constantly involved in creation and intervenes by way of natural law. Because they saw no conflict of their views with biblical Christianity, essential doctrines of the faith were preserved.[38]

The second Protestant response was to reformulate Christian doctrine and make it compatible with modern scientific thought. Frederick Temple, later Archbishop of Canterbury, viewed evolution as the process by which the natural world works—God simply set the process in motion from the beginning. His is a deterministic view of the world in which God is distant and rarely interferes.[39]

The reformulation of Christian doctrine was embraced by the Protestant Liberalism movement of the late nineteenth century. This movement sought a "liberation of mind and a resulting purer Christianity informed by reason, moral good, and modern science."[40] Henry Ward Beecher, pastor and major contributor to the Protestant Liberalism movement, understood evolution to mean that humans can struggle to rise above base beginnings and, with the power of the mind, rise from fleshly things to the divine.[41] According to Beecher, "Evolution…takes us beyond the static God of the Enlightenment and presents us with an active God at work in the universe over ages of time. Evolution therefore improves our understanding of design."[42]

The third method of incorporating evolution into theology taken by the liberal protestants was to make evolution a cornerstone of theology. In this line of thinking, the evolutionary process itself becomes the means of reconciliation with God and the Incarnation

38 Gregory 380-381
39 Gregory 381
40 Hoeveler 105-106
41 Hoeveler 115-116
42 Hoeveler 121

is the fulfillment of that process. John Bascom, embraced the liberalism of Beecher and went on to say that there is no sharp distinction between mind and matter. Therefore, Bascom argues, the evolutionary process of the expansion of the human mind, from lower forms until now, allows humans to comprehend God, and makes God's revelation complete.[43] This liberal view is summed up by Arthur Peacocke:

> …Jesus the Christ, the whole Christ event, has…shown us what is possible for humanity.…In Jesus there was a *divine* act of new creation…[Jesus] represents the consummation of the evolutionary creative process which God has been effecting in and through the world.[44]

In each of these responses, science is subordinated to religion in varying degrees. The more conservative groups which accepted darwinian evolution did so while maintaining the essential concepts of orthodox Christian theology. The more liberal movements tended to use the challenge of evolution as an opportunity to reformulate Christian doctrine in ways which abandoned many traditional Christian beliefs. The liberal viewpoint focused on higher moral values and had little need for sinful humanity or redemption.[45]

Darwin's theory of evolution by means of natural selection met with strong criticism among conservative Protestants. Many Christians in the nineteenth century saw natural selection as a direct attack on their faith. Indeed, their concerns were justified since many of the proponents of darwinism argued that science had supplanted faith as the way to know ultimate truth. Opponents of Darwin and his ideas had three main objections to natural selection. One, scientists were attempting to explain the facts of nature. Two, a common-sense incredulity seemed to defy the likelihood of undirected evolution developing complex structures like the human eye. Three, Darwin claimed an impersonal natural law but

43 Hoeveler 124-125
44 Peacocke 85
45 Bowler 166

constantly anthropomorphized it to explain natural selection.[46] These arguments against Darwin and the negative theology that developed to counter evolution caused Darwin's theological critics not to be taken seriously.[47] The negative theology that was developed offered no new ideas and were simply a reformulation of pre-Darwin thought.

In 1874, the first orthodox response to Darwin emerged in Charles Hodge's *What is Darwinism?* Hodge sums up his argument by writing "…the denial of design in nature is virtually the denial of God."[48] Hodge did not believe that he was opposing science. Rather he believed that Darwin's theories were based on dogmatic belief[49] and therefore not true science. Hodge believed himself to be a supporter of scientific inquiry and cautioned other theologians against basing biblical interpretation on scientific ideas.[50] This admonition against basing theology on scientific thought was echoed by Charles Spurgeon: "Science is never in conflict with the truths of Holy Scripture, but the hurried deductions drawn from those facts, and the inventions classed as facts, are opposed to Scripture."[51] The example given is that of correlating the six days of creation with prehistoric geological periods. If, Spurgeon argues, the geological history of the earth were to be revised because of newly discovered evidence, Scripture is not proved wrong, merely the interpretation of it. These warnings by Hodge and Spurgeon spoke directly to those who would change Christian doctrine to incorporate the theory of evolution.

The current conservative reaction to Darwin's theory of evolution is found in the Intelligent Design (ID) movement. To understand this movement, one must understand its

46 Hoeveler 86-87
47 Gregory 377
48 Gregory 377
49 Gregory 376
50 Hoeveler 80-81
51 Doug Kutilek. "Spurgeon on the Bible and Darwinism, Part 2." *ShaperIron*. 25 Oct. 2008. <http://sharperiron.org/2007/08/31/spurgeon-on-the-bible-and-darwinism-part-2/>

origins.

Darwinian evolution was widely accepted by the end of the nineteenth century, even among theologians. The rise of fundamentalism in the 1920s resurrected the pre-darwinian argument from design,[52] that is, that the design seen in nature is sufficiently complicated to require supernatural origins. According to Francisco Ayala, the early twentieth century opponents of the teaching of evolution can be traced to Seventh Day Adventism and Pentecostalism.[53] State legislatures in Arkansas, Mississippi, Oklahoma, and Tennessee were persuaded to pass resolutions prohibiting the teaching of evolution in public schools. Conservatives were concerned that evolution was encouraging the relaxation of moral values and teaching people to behave like animals.[54] These prohibitions were challenged in various court cases, including the famous Scopes Monkey trial. Eventually, the Supreme Court declared unconstitutional any law banning the teaching of evolution. Fundamentalists then changed their argument and began to insist that "creation science" be taught alongside "evolution science" in schools. "Creation science, it was asserted, propounds that all kinds of organisms abruptly came into existence when God created the universe, that the world is only a few thousand years old, and that the biblical Flood was an actual event that only one pair of each animal species survived."[55] After World War II, fundamentalists focused on extreme biblical literalism and attacked evolution and the scientific disciplines behind it such as geology and paleontology. The equal time laws were struck down in court in the 1980s because, the Supreme Court said, the phrase "creation science" endorses a specific religious

52 Bowler 176
53 Francisco Ayala, Darwin's Gift: to Science and Religion 2007, 25 Oct. 2008. <http://www.myilibrary.com/Browse/open.asp?ID=84437&loc=Cover> 168
54 Bowler 181
55 Ayala 169

viewpoint.[56] The phrase was changed to "Intelligent Design," and the original argument from design critique of Darwin's work became the movement's centerpiece. ID, itself, was challenged in court. The 2005 *Dover* decision, issued by Judge John Jones in Pennsylvania federal court affirms that ID is a religious view and not a scientific theory, and moreover, confuses students' understanding of the current state of scientific enquiry.[57] Similarly, Bowler gives the following critique of Intelligent Design:

> …there is no active scientific research based on ID. The movement's arguments are always negative: it claims that here is something you will *never* explain—and the whole point of science is to identify a puzzle and to propose naturalistic hypotheses as potential explanations. If the ID movement's argument is accepted in any one case, science simply has to give up at that point, so ID is not so much a form of science as an excuse for stopping science in its tracks.[58]

In more recent years, theologians have attempted to bridge the gap between the liberal response of changing Christian doctrine and the fundamentalist response of replacing science with theology. Many Christian denominations, including Catholics, Presbyterians, and Lutherans, affirm evolution and see no conflict with Scripture.[59] The fundamentalist view on creation science is relatively new. "[B]etween 1800 and 1950, hardly any educated person would have endorsed the position we now call young-earth creationism. The fact that the earth had changed over a long period of time was accepted even by those who found the theory of evolution disturbing."[60] However, as science began to explain more and more of the natural world without using a divine First Cause, fundamentalists feared these new views would undermined important church doctrines and the authority of scripture. Contrary to orthodox Christian belief, Darwin's theory claims humans are not fallen form a high state but

56 Ayala 169
57 Ayala 171
58 Bowler 213
59 Ayala 164-165
60 Bowler 191

emerging from a low one.[61] There is tension in the conflict between science and religion on both sides of the debate. Modern scientific views bring with them certain philosophical ideas that can be just as dogmatic and proselytizing as religious viewpoints,[62] and, in trying to reconcile science and theology, "many religious intellectuals tend to give away too much to science while neglecting the interests of religion."[63] A more moderate view sees science and religion as two different realms that together inform the individual in how to live. Science cannot confirm religious belief, but it can confirm or deny facts about religious beliefs. Religion, on the other hand, does not reveal natural law but can judge science by guiding the direction of scientific inquiry and commenting on the meaning of scientific truths.[64] As an analogy, science and religion go together like architecture and aesthetics. Solid architecture does not mean a structure is beautiful; likewise, a structure's aesthetic appeal does speak to its structural soundness. One may admire the architectural principles of a building or see order in its aesthetic properties, but great structures require attention to both architectural and aesthetic principles. Similarly, individuals must incorporate scientific principles and religious truth to determine meaning and purpose in life.

When studying the profound changes Darwin's theory brought to both the religious and natural worlds, one may wonder how the would would be different had Darwin never been born. Two simple answers immediately spring to mind. First, one may suppose that since natural selection is the basis of so much in modern science, everything would be totally different. Second, had Darwin never lived, because of the likelihood that someone else would

61 Terry D. Cooper. *Dimensions of Evil: Contemporary Perspectives*. (Minneapolis: Fortress Press 2007) 22
62 Cooper 29
63 John C Caiazza. *The War of the Jesus and Darwin Fishes*. (New Brunswick: Transaction Publishers 2007) 131
64 William Sweet. "Science and Religious Belief: Some Conceptual Issues." *Religion and the Challenges of Science*. Ed. William Sweet and Richard Feist. (Burlington, VT: Ashgate Publishing 2007) 225-227

have published a similar theory, life today may be very similar to how we currently see it. Both theories can be supported by evidence, but they offer a very simplistic answers. A more nuanced view is much more fun.

After returning from his voyage on the *Beagle*, Darwin began writing a very large work meant to explain his theory and its implications. In 1858, he received a manuscript from Alfred Wallace that described a theory of evolution by means natural selection based on his own work in Indonesia.[65] After reading Wallace's work, Darwin quickly wrote a summary of his thoughts and findings and published them in *Origin of Species*. Had Darwin not published in 1859, Wallace's work would have been published, and today we would be discussing the implications of Wallian evolution. This argument discredits Darwin, though, because one of the major factors in the acceptance of *Origin* was its clear style and well-reasoned arguments. Had Wallace published instead of Darwin, his work may not have been as well argued, and theological arguments may have been more successful against his ideas.

Darwin's impact, though, is not his theory, *per se*, but its completion of the Scientific Revolution and the total separation of science and theology. Suppose the theory evolution by natural selection had never been proposed by either Darwin or Wallace. If we today lived in a world where natural selection had never been proposed, how would our world be different? To answer such a question, one must concede that many scientists in the nineteenth and twentieth centuries would have needed to be either blind or stupid to not draw darwinian conclusions from the results of their experiments. Genetics, geology, paleontology, archeology, and biology all offer evidence for natural selection, and we would need to assume that darwinian conclusions were not developed in any of these fields.

65 Darwin 121

Perhaps the best way to answer this question is to look at the social context and worldview of 1858 and extrapolate one hundred fifty years. If natural selection had not been proposed, the Age of Reason may have never come to an end. Modernism replaced the Age of Reason after the horrors of World War I demolished the idea that humanity was always advancing. If self-reliance and the supremacy of reason were not completely separated from the divine, as they were by the theory of natural selection, the Great War and its horrors may have been attributed to God's dealings and not a product humanity's failure. This would have caused a great apostasy, but neither the fundamental idea of the time (that is, human progress by reason) nor the authority structures would not have been in danger. This response would have been similar to the response of the Jews to the Holocaust. Many lost their faith, yet Jews still retained their cultural identity and sense of place in the world.

If the Age of Reason had not ended, Christian fundamentalism might not be as strong. Fundamentalism grew in prominence in the 1920s in response to the materialism of the preceding forty years. However, had divine purpose still been a part of the prevailing worldview, fundamentalists would have not focused on responding to materialism but rather responding the great apostasy that would have followed World War I. The preaching of divine purpose would have fallen of deaf ears for most of that decade, but when hard economic times hit during the Great Depression, the fundamentalists' message would have reverberated with people and led to the Third Great Awakening.

Science also would be radically different had natural selection never been proposed. All scientific theories proposed in the mid-nineteenth century required a natural explanation to be accepted, so we can assume that naturalistic explanations to observed phenomena would still be proposed had Darwin not lived. Genetics, as discovered by Mendel, is known today as

the primary mechanism of natural selection. Without a theory of natural selection, though, Mendel's works would have been seen as arcana already known for centuries by farmers and shepherds. Mendel's work would be resurrected and examined later in to the twentieth century, but the field of genetics as we know it today would be but a shadow of itself. Likewise, biological understanding would be limited to studying homogenous members of groups rather than distinct individuals. Unfortunately, this limited understanding, combined with a lack of development in the field of genetics, would have radical consequences for medicine. Inherited diseases and cancers may be attributed to diving purpose or curse in a family. Of course, if a family were viewed as cursed by God, they might be socially outcast and, for lack of mates, die out quickly, thus ending the curse (or genetic disease).

One interesting development in the late twentieth century is that of using computers and evolutionary algorithms to solve problems containing multiple interconnected variables. Such programs can produce unexpected and novel solutions to questions that may otherwise be exceedingly difficult to solve. One example of such a problem is the design of an antenna. Each part subtly affects the effectiveness of every other part of the antenna, so creating an optimal design is quite difficult. An evolutionary approach creates thousands of random designs, determines their effectiveness, and then "mates" good antennas together to create the next generation of antenna. This process is repeated hundreds or thousands of times to create a final antenna design that meets or exceeds all design goals. Without a thorough understanding of darwinian concepts, such programs would not be written.

The life sciences in general would be informed by theology, and, therefore, scientific inquiry would be limited. There would be no search for the origins of humans or life in general because, theology says, "God did it." Theology would also limit the direction of other

fields of study either because of lack of perceived need to study it (why study when one knows that the cause is God?) or because of prohibition by theological interpretation. Fields thus limited would include birth control, cloning, stem cell research, and the search or extraterrestrial life.

In order to control the direction of scientific inquiry, theologians would need to establish a scientific council which must approve all scientific research. This council would start with good intentions, but it would quickly consolidate power and begin to suppress dissenting opinions. Most likely, such a controlling council would inspire a second reformation to break free of religious authority.

Darwin's theory of evolution changed the course of history. While offering a more complete view of the natural world for science, his ideas presented the church with its most significant challenge ever. With Darwin, a complete worldview apart from theology was possible and defensible. His ideas on life have revolutionized the understanding of humanity and its place in the world. His goal while on board the Beagle, to "take a fair place among scientific men,"[66] has been met, perhaps beyond his wildest imagination.

66 Darwin 81