According to Thomas S. Kuhn, the author of *The Structure of Scientific Revolution*,¹ at a particular time there can be in the scientific community a consensus as to how certain phenomena are to be explained. This explanation or theory permeates the world view in education and forms the background against which people do their thinking, acting as a kind of baseline. It is called a paradigm; and this paradigm is the framework within which the thinking of a particular era is done. Such was the Ptolemaic theory, the earth-centered theory embraced by nearly all for centuries. Even after Copernicus (1473–1543) had presented his heliocentric alternative, it still took centuries for the Copernican theory to establish itself beyond further challenge. While the old paradigm is under challenge, there are always defenders of the new theory who argue vigorously and ingeniously to attack the anomalies which appear to undermine the old theory. Since he published the *On the Origin of Species* in 1859, Charles Darwin’s hypothesis of natural selection has become the paradigm of our time, and the concept of so-called evolution is one of the dominate theories of our culture. When Mortimer J. Adler came to write on the idea of evolution for *The Syntopicon Volume of Great Ideas*² he began:

This Chapter belongs to Darwin . . . The point is rather that many of the topics are dictated by and draw their meaning from his thoughts, and he figures in all the major issues connected with the origin of

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species, the theory of evolution, and the place of man in the order of nature.

Today there is an increasing recognition of difficulties with what we will call Darwinism, and these challenges to the dominance of this theory have prompted vigorous responses on the part of Darwin’s defenders. Nevertheless there are instances of what may be considered challenges to the dominant theory, and here the work of Gilson and those behind the Intelligent Design (ID) movement fit in.

The insight regarding Kuhn’s paradigm thesis and the challenge to the Darwinism is not original with me. It is the subject of the final chapter of Michael Denton’s *Evolution: A Theory in Crisis* entitled “The Priority of a Paradigm.” The overwhelming bulk of this study is a review of the evidence that can be brought to bear to support the evolution of species; but when the summation is made, the hypothesis that all nature represents a continuum of beings, which is sometimes called the community of nature, and that this continuity has developed over tremendous amount of time by the process of natural selection, by a mechanism of chance—Denton argues the evidence is not there. Quoting a great and articulate supporter of Darwin, Ernst Mayr: “all evolution is due to the accumulation of small genetic changes guided by Natural Selection and that transpecific evolution is nothing but an extrapolation and magnification of the events which took place within population and species.” Denton comments on Mayr: “This theory remains as unsubstantiated as it was one hundred and twenty years ago.”

Denton affirms that on the microevolutionary level the Darwinian theory is a success; that is in explaining diversity in a limited area, but the gaps in the overall continuum, the so-called continuity of nature, still exist as they did in Darwin’s time, and all the paleontological digging by Darwin’s supporters has failed to uncover evidence to fill in those gaps.

That gaps cannot be dismissed as inventions of the human mind, merely figments of an anti-evolutionary imagination—an imagination prejudiced by topology, essentialism or creationism—is amply testified by the fact that their existence has been just as firmly acknowledged by the advocates of evolution and continuity.

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4 Id., 344.
5 Id., 345.
Within five years of Denton’s challenge in 1986, Phillip E. Johnson’s *Darwin on Trial* delivered a further blow to the paradigm of Darwinism as Johnson argued from the point of view of a trial lawyer and law professor that Darwin had failed to make a successful case for the origin of species by natural selection and its activation by chance.

In a feature of the 2nd edition in 1993, Johnson added an epilogue, “The Book and its Critics.” In this reflection on the response to his critique of Darwinism and the scientific naturalism of the contemporary paradigm, he refers to Stephen Jay Gould’s review in *The Scientific American* (July, 1992): “The review was an undisguised hatchet job aimed at giving the impression that my skepticism about Darwinism must be due to ignorance of basic facts of biology.”

Johnson’s work provoked widespread negative response in scientific journals, but here was a critic who could not be dismissed as a young earth fundamentalist exponent of *Genesis*. In a relatively short time Johnson was the center of Symposia on university campuses where he was prepared to debate Darwinists. I cannot say how much this played into what was a growing movement of ID but it, the increasing criticism of Darwinism, was soon to be followed by other writings that, taken together, may be judged as a movement. And in the past few years this has come to be called “Intelligent Design.”

*Darwin’s Black Box: The Biochemical Challenge to Evolution* by Michael J. Behe was a work by a professional chemical biologist who could not be dismissed as Johnson was with the remark that “he is just a lawyer.” Rather Behe argues that the “irreducible complexity” of the organisms studied in molecular biology cannot be explained by the chance workings of natural selection.

Shortly after Behe’s criticism was published, the writings of a mathematician and scientist began to appear; William A. Dembski’s *The Design Inference: Eliminating Chance Through Small Probabilities* came out in 1998 along with a work edited by him, *Mere Creation: Science, Faith and Intelligent Design*. The next year, 1999, another book of his was published, *Intelligent Design: The Bridge Between Science and Theol-

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7 Id., 160.
Here, as the titles indicate, the ID people, while not arguing from the religious premises or revelation, are indicating more than a simple openness to religion; they are showing that their arguments for design in nature leave the door open for an intelligent designer, i.e., a Creator. Dembski’s work as a mathematician is to show how great the probability is against a species development by the chance process of natural selection.

These publications are accompanied by a number of websites and the funding of different institutes devoted to furthering the anti-Darwinist cause. In late September of 2002, I attended a conference on the University of San Francisco campus devoted to the program of ID. It featured splendid videos and well designed charts and slides. I should add the conference was organized by a colleague in the School of Business and only a few professors from the College of Sciences attended; the conference received part of its funding from a Jesuit foundation. But what you might call the scientific establishment on campus ignored the conference, although one of the biology department members, Professor Paul Chien, presented a paper on a Chinese archeological digging.

It should be noted that the ID movement has, of course, provoked a counter response from the Darwinists whose vigor in argument indicates that more than biology is at stake. The whole structure of naturalistic materialism and the respectability of atheism are being challenged, and the replies by the Darwinists are comparable to a religious jihad. Certain names come up at once; Stephen Jay Gould responded to Phillip Johnson; Daniel C. Dennett entered the list with *Darwin’s Dangerous Idea: Evolution and the Meanings of Life*; but most of all the fight has been carried by Robert T. Pennock whose *Tower of Babel: The Evidence against the New Creationism* and his well done anthology *Intelligent Design Creationism and Its Critics: Philosophical, Theological and Scientific Perspectives*, a work of over 800 pages containing both pro and con Darwinist articles. Another author who should be mentioned is Richard Dawkins, whose book, *The Blind Watchmaker*, came out in the mid-1980’s.

At some point it is necessary to define Darwinism. When Darwin published *On the Origin of Species* in 1859, his intention was to provide an explanation for the variety of plants and animals which populate the earth.

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His explanation is one which repudiates what he would consider a “supernatural” explanation; again supernatural in this context means immaterial, a non-mechanistic cause. Briefly Darwin sought to replace the account of our origin given in *Genesis* with his own mechanistic explanation, i.e., matter in motion explanation called natural selection. He sought to do away with the notion of a Divine Creator as the cause of the variety of life on earth.

Right from the start Darwin faced opposition from traditional religious persons who objected to the downgrading or rejection of Scripture’s account of our origins. Even today a vocal minority of “Creationists” oppose the sole teaching of evolution in our schools and use the political system to convince school leaders to include “creation science” along with the theory of evolution in public school’s curricula. These are sometimes referred to as the “Young Earth” opposition since in their literal reading of the Bible (particularly of the first chapters of Genesis), they interpret the origin of the universe to have been accomplished in some six days, less than 10,000 years ago.

Please note that I am not considering this sub-set of Darwin’s critics in this essay. Rather those who have come to be identified with the ID movement are contemporary working scientists, professors of natural science for the most part (Phillip E. Johnson, a law professor, is an exception) who having been brought up, as it were, in their undergraduate and graduate studies in Darwinism, and they came later in their own work to be impressed with its shortcomings and its failure to account for the origin of life, and the development of cellular processes and other living processes. Impressed with the complexity, the irreducible complexity of vital activities, they have come to reject the notions that the processes can be explained by chance. For Darwin’s natural selection is a blind action in which the biological processes were developed over an immense amount of time in a fashion that eliminated the mutations that failed to further life and saved the variations better suited to the environment. In a phrase the ID proponents are not buying a theory that asserts the world as we know it developed by chance. It had to have an intelligent design.

Perhaps here is the place to say a word about the “theistic evolutionists.” They are those who accept Darwin’s natural selection as the origin of species and the biological processes of the living things in the species. To put it simply they accepted Darwinism, but tried to “baptize” it by affirming that there is a Divine creator and what Darwin proposed was for them simply God’s plan all along. Here Teilhard de Chardin comes to mind.
(interestingly in the literature his name is rarely mentioned; Phillip Johnson is one exception, but his name is absent from the indices of most books I have looked at). However, to the ID persons, this is to be rejected for these theistic evolutionists have accepted the Darwin thesis of natural selection as a full explanation of the biological processes, the very thing the ID people judge to be a failure.

Now for the parts of Darwinism that are accepted by the ID: the micro evolution within a species, the age of the earth since the Big Bang is some four and a half billion years. These are microbiologists whose study of cellular activity leads them to conclude that the result indicates more than a chance adaptation. The irreducible complexity they see indicates that it is mathematically improbable that what we have is the product of chance, a blind watchmaker. Rather in their scientific judgment Darwin’s explanation falls short; the scientific observation they affirm indicates an intelligent design though they do not use the words that Gilson would call finality or purpose in nature.

In relating Gilson’s From Aristotle to Darwin and Back Again: A Journey in Final Causality, Species, and Evolution\textsuperscript{16} to the ID proponents who are concerned to show the shortcomings of Darwin and raise doubts about his theory on the origin of species, that is the development of various life forms in plants and animals, I must be careful not to suggest that Gilson’s intention is the same as theirs. Yes, in some ways they are on the same side in opposing the anti-creation thrust of Darwinism, but Gilson is neutral on the validity or truth of Darwin’s hypothesis that natural selection can account for the transmutation of species.

As a matter of fact Gilson is careful to say he is not engaging in a work of biology; he is rather doing what Aristotle does in his Physics, or as we would say, more recently, the philosophy of nature. Also Gilson, the historian of philosophy, is intrigued by the aspects of the history of ideas that took place in 1859 when Darwin published his epoch making On the Origin of Species.

Gilson is intrigued by the fact that in the popular mind and in the later generations of the 19\textsuperscript{th} and 20\textsuperscript{th} centuries Darwin came to be known as the author of the theory of evolution. As Gilson notes, however, Darwin did not use the word “evolution” in the 1\textsuperscript{st} edition of On the Origin, nor in

the next four editions. It is only in the 6th edition of 1872 that the word “evolution” occurs and is used only once. Gilson, the historian, takes great care to show that it was Herbert Spencer (1815–1890) who, before Darwin in 1857, wrote of the progressive development he saw in nature and in society and began to promote the idea of an evolutionary process. And further, Spencer, the real father of evolution, was not taken with Darwin’s notion of natural selection. Gilson, the philosopher and historian of philosophy, shows a special sympathy for Spencer, the philosopher, and his deductive approach to his subject. Gilson is also a tremendous admirer of Darwin the biologist and his painstaking study of the biological processes in finches of the Galapagos Islands, the pigeons and the barnacles. He admires Darwin’s temperament and his wish to avoid controversy even as he comes to repudiate the Creation story so much accepted by the bulk of his contemporaries. Was Darwin right? Here is what Gilson says not up front as it were in his preface but tucked away in the middle of the Darwin/Spencer analysis:

. . . to know if the response of Darwin to the biological problem of the origin of species was true or not is a question the reply to which is beyond us. It is certain in any case that Darwin posed a scientific program, which he had long studied by scientific methods and to which, in his mind, the solution which he proposed has value only to the extent that it was scientific, that is to say justified by reasoning based on the observation of facts. Darwin was the incarnation of the scientific spirit, as avid in the observation of facts as he was scrupulous in their interpretation.17

Thus we can infer that Gilson was neutral on the truth of Darwin’s theory. At the age of 87 when he published in 1971 the French edition of his study, he had been working on the matter for some years. Only someone like Fr. Armand Maurer who was close to Gilson in the 1960’s (there were others, of course, like Pegis and Owens but in different ways they are gone) can tell us how long he worked at this question. His very footnotes indicate years of reading in English and French sources, and he was already giving public lectures which were in part chapters in his book. At the University of San Francisco in 1970 when the university was honored to present him with an honorary degree, his acceptance response was to read a part of his Darwin study. When you look at Gilson’s life span (1884–

17 Id., 61–62.
1978), you realize that while he was studying and teaching philosophy the controversy over evolution was part of the intellectual background of his formative years. More than that in *The Philosopher and Theology*, his intellectual autobiography, he reflects on the impact that Bergson’s lectures at the Collège de France had on him. “Thanks to him, metaphysics, once banned by Kant, was being reinstated in France . . .” The publication in 1907 of *Creative Evolution* was an event Gilson felt obliged to comment on, yet, the treatment in Gilson’s *Darwin* book is difficult to summarize. A mix of misunderstanding is involved. For Gilson maintains that whom Bergson is criticizing is really Spencer, and while Bergson is bringing out the inadequacies of the mechanism of evolution and favoring finality in nature, Bergson is misunderstanding the finality of Aristotle, and further Bergson’s failure to appreciate what intelligence can truly accomplish is itself a limitation to his critique. But Gilson is always appreciative of the contribution Bergson made in recognizing the failures of Darwinism to fully account for the vitality of the natural world.

Though in these years of the late 1960’s Gilson’s research was leading him to a position not identical with the ID proponents, he shared somewhat the same judgments about the phenomenon which came to be called Darwinism. As a careful historian of ideas Gilson notes, the popular acceptance of evolution in the 20th century was a curious mixture of the biological research of Darwin and the propaganda for evolution as a philosophy promoted by Herbert Spencer. Darwin provided a hypothesis to account for the transmutation of species he called natural selection. Spencer provided a philosophy of progressive change and improvement called evolution. The merging of these theories in the popularization of the anti-biblical rejection of the teaching of *Genesis* on creation was accomplished in large part by someone like Thomas Henry Huxley, the author of an article on evolution in *Encyclopedia Britannica* (9th edition, 1878). As this movement came to be generally accepted by working natural scientists and incorporated into college and high school text books, the fact that the theory had not been demonstrated seemed to be overlooked. Later as the work of Gregor J. Mendel on genetics came to be known, these hereditary factors were brought into what we can call Darwinism and into the 20th century a new synthesis and modification of Darwinism was achieved.

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19 Id., 134.
20 Id., 90–104.
The landmark of the success of Darwinism was 1959, the centenary of the publication of *On the Origin of Species* when the academic world that loves to celebrate centenaries held an international conference at the University of Chicago to commemorate the work of Charles Darwin. In a word it was a triumph. It might be noted in passing that this was the year the English translation of Pierre Teilhard de Chardin’s *The Phenomenon of Man*\(^{21}\) appeared, and, in the scientific/religious mood of the time went on to great popular success for his proposal that evolution was the means God had chosen to achieve His work of Creation.

While I do not know the answer, I like to speculate the fuss that de Chardin was causing in Catholic intellectual circles may have been a motive for Gilson to go forward with his own research and reflections on the phenomenon of Darwinism.

It is a fact that both Jacques Maritain\(^ {22} \) and Gilson\(^ {23} \) give a negative reaction to the phenomenon of Teilhardism when they were invited to comment. Of course, too they were conforming to the judgment of Pius XII and his encyclical *Humani Generis* of 1950.

As stated Gilson’s research in the 1960’s leading to its publication in 1971 was some twenty years ahead of the ID movement, but his work anticipated some of their principles with its emphasis on finality in nature which requires intelligence, and also the emphasis that the doctrine of natural selection as a process to account for the transformation of species remains undemonstrated and inadequate.

In his chapter on “Finality and Evolution,” Gilson quotes with approval the articles on evolution in the *Encyclopédie Française* by Paul Lemoine, professor at the Museum of Paris: “Volume IV of the *Encyclopédie Française* will certainly mark an epoch in the history of our ideas on evolution. From its reading it becomes evident that this theory appears about to be abandoned.”\(^ {24} \) In the footnotes for this section, John Lyon, the translator says:

Gilson gives no citation for any of the quotations from Lemoine. The passages he cites, however, are scattered throughout (pages of the V\(^ {th} \) volume) . . . the section entitled “Que valent les théories de


\(^{24}\) Gilson, *Darwin*, 88.
l’évolution?” in “Conclusion Générale,” IV. Les êtres vivants of the Encyclopédie Francaise. ²⁵

Gilson has more from Lemoine and it is tempting to quote it extensively, but in a short article it is better to let an interested person go to the source and for my purposes suffice it to say that Gilson seems to agree with the Lemoine statement: “The result of this exposé is that the theory of evolution is impossible.” ²⁶

In a chapter titled “The Limits of Mechanism,” Gilson continues to argue that the approach of Darwin which tried to account for the origin of species by just considering matter in motion, i.e., the material and efficient causes of a natural happening gives an inadequate picture of reality. What is missing is Aristotle’s substantial form, and this immaterial principle is excluded from consideration by the methods of scientism, the naturalistic approach so favored by contemporary philosophy. There is, of course, an intimate connection in Aristotelian philosophy of nature between the formal and final causes, and while the ID people do not speak of substantial forms, their championing of design or purpose brings them close to the traditional philosophical position. It should be mentioned in passing that the virulence of attack by contemporary Darwinists on the ID position can partially be explained by their doctrinaire anti-immaterialism and atheism. To Daniel Dennett: Natural Selection makes it intellectually respectable to be an atheist; it was the gist of his book. ²⁷

Further in “The Limits of Mechanism,” Gilson anticipates the research of some of the ID writers by using the work of the American biologist, Walter M. Elsasser, then professor of geology and biology at Princeton University. His work Atom and Organism: A New Approach to Theoretical Biology ²⁸ brought contemporary physics to the study of the cell, or in other words applied quantum mechanics to the cell. Again without trying to duplicate the Gilson chapter the conclusion is that the cell as a single entity eludes mechanistic explanation.

It is impossible to pose these questions without immediately seeing that, in nature such as we see her, no scientific observer has ever seen cells outside of some tissue, nor tissues subsisting spontaneously outside of a living body which itself is a member of a species. These are facts. It is too

²⁵ Id., 185.
²⁶ Id., 88.
²⁷ See note 12.
easy to reserve to science the facts which we can satisfactorily explain and to consign the rest to philosophy. The existence of cells is not contested. The question is only one of knowing whether it is scientifically demonstrated that organisms are “multiples of cells”? If such demonstration exists, we would love to know its whereabouts.  

Gilson’s concluding chapter, “The Constants of Biophilosophy,” is more than a summary of the need to approach nature in an Aristotelian way. Yes, take account of substantial forms or souls in living things, but recognize also that the mechanistic approach to reality owes so much to Descartes for whom matter was extension. It is enjoyable to read Gilson, the great Cartesian expert on the Descartes about whom he first made his reputation as a great scholar of the texts of a philosopher. For example, after treating Paley and his example of a watch as a thing manifesting finality, Gilson remarks in passing: “We say that primitives take a watch for an animal, but only the genius of Descartes was able to take animals for watches.”

Gilson well understands that according to scientific method final causes are excluded from consideration, but he is calling for a biophilosophy which will be open to the reality of human experience as Aristotle was and recognize that teleology is present in nature. “Teleology is perhaps a contestable explanation; chance is the pure absence of explanation.”

Referring to Julian Huxley, the descendent of Thomas Henry Huxley, the popularizer of the doctrine of evolution, who speaking of the mechanism of natural selection argued that it, with the aid of time, produced the world as we know it, Gilson says: “Here we have an inadvertent comedy, which we can avoid only by saying that, scientifically as well as philosophically, the mechanism of natural selection is simply a non-explanation.”

This is the tone of the final chapter. It is not a refutation of the work of Darwin. It is rather an expression of disappointment that the academic world has overlooked the fact that Darwin failed to establish what he set out to establish, i.e., the origin of species.

It was Michael Denton who first, to my knowledge, raised the issue of a paradigm change revolution. In the final chapter of his book “The

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29 Gilson, Darwin, 113.
30 Id., 123.
31 Id., 130.
32 Id., 131.
Priority of the Paradigm,” he returns to the topic and, while re-affirming what he judges are the limitations of Darwinism, he recognizes a paradigm change occurs only when there is an alternative theory to replace the current one.

The twentieth century would be incomprehensible without the Darwinian revolution. The social and political currents which have swept the world in the past eighty years would have been impossible without its intellectual sanction. It is ironic to recall that it was the increasingly secular outlook of the nineteenth century which initially eased the way for the acceptance of evolution, while today it is perhaps the Darwinian view of nature more than any other that is responsible for the agnostic and skeptical outlook of the twentieth century. What was once a deduction from materialism has today become its foundation.

Ultimately the Darwinian Theory is no more nor less than the great cosmogenic myth of the twentieth century . . . The truth is that despite the prestige of evolutionary theory and the tremendous intellectual effort directed towards reducing living systems to the confines of Darwinian thought, nature refuses to be imprisoned. In the final analysis we still know very little about how new forms of life arise. The “mystery of mysteries”—the origin of new beings on earth—is still largely as enigmatic as when Darwin set sail on the Beagle.33

Whether or not the ID movement is the beginning of the formation of a new paradigm is difficult to say. To move closer to that, the naturalistic method would have to be enlarged to embrace finality which the scientific method now excludes.

No alternative theory is on the horizon. Rather we seem to be in a phase comparable to the development of epicycles to save the Ptolemaic theory when the orbit of Mars could not be explained in the earlier versions of the Ptolemaic theory, and astronomers wedded to the geocentric theory were inventing ways to save their paradigm.

Should a paradigm shift come in the future decades, to Gilson’s credit, he wrote a work in 1971 which preceded the ID movement by some twenty years. And he did so by going back to Aristotle.34

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34 Two other works which I used in preparing this article but did not quote in the footnotes are
GILSON, DARWIN, AND INTELLIGENT DESIGN

SUMMARY

The article starts with stating the fact that today there is an increasing recognition of difficulties with Darwinism accompanied by vigorous responses on the part of Darwin’s defenders; among the instances of challenge to the dominant theory, one can find a book of Gilson, *From Aristotle to Darwin and Back Again*, and those behind the Intelligent Design movement. In relating the book of Gilson to the ID proponents, the author concludes that, while in some ways they are on the same side in opposing the anti-creation thrust of Darwinism, Gilson is neutral on the validity or truth of Darwin’s biological hypothesis. Gilson, however, whose book preceded the ID movement by some twenty years, seeks to analyze Darwinism from the perspective of the classical philosophy of nature. He well understands that, according to modern scientific method, final causes are excluded from consideration, but he calls for a biophilosophy which will be open to the reality of human experience as Aristotle was and recognize that teleology is present in nature. According to him, even if teleology seems to be a contestable explanation, chance as understood by Darwinists is the pure absence of explanation.

KEYWORDS: Gilson, Aristotle, Spencer, Darwin, Darwinism, evolution, intelligent design, teleology.