

Science, Enlightenment, Progress, and Evolution

*"Give me a lever long enough and a place to stand,
and I will move the world."*

Archimedes

In this chapter I describe the emergence of secular and scientific theories of reality in the modern West and how these new theories were applied to thinking about time and the future. The central theme of the chapter is the emergence of a new progressive image of time, history, and the future of humanity. As I describe in the following pages, this progressive image is multifaceted, with many different interpretations and points of emphasis, and there are, as well, some noteworthy criticisms and counter-proposals that emerged in modern times. Overall though, the rise of modernity in the West was connected with a general shift to a new secular-scientific vision of progress. That is the focus of this chapter.

I begin with a history of the rise of modernism in the West, starting with the High Middle Ages and continuing through the Renaissance, the Age of Exploration, and the Reformation. I next examine one of the most significant defining events in the rise of modernity – the Scientific Revolution – and how it provided a new approach to the acquisition of human knowledge and predicting the future. Next, I describe the philosophy of the Enlightenment and, in particular, the idea of secular progress that crystallized and gained force within this philosophical movement. The idea of secular progress provided a general conceptual framework and set of ideals for understanding and directing the future. After discussing the Enlightenment, I review the ideas of Hegel and Marx, two of the most influential philosophical theorists of progress in the nineteenth century, though each put a particular unique spin on the idea of progress. Hegel and Marx are well known for developing the dialectical theory of change and applying the theory to both the history and future of humanity. Then I look at Romantic philosophy and its critique of the Enlightenment. Romanticism stands to Enlightenment philosophy as the Dionysian mindset stood to the Apollonian mindset in classical times. The Romantics provided a different interpretation of the present, as well as a different vision of the future. In the final section of the chapter, I discuss one of the most important theories to emerge within modern science – Darwin's theory of evolution. The idea of evolution was seen by many philosophers and social theorists as providing a comprehensive scientific basis for understanding progress and change in both the natural and civilized world.

The Rise of Modernism

"In the past thousand years, and particularly in the past two or three hundred years, a transformation more rapid and more fundamental than any other in human history has taken place. A new threshold was crossed, leading to a fundamentally new type of society."

David Christian

During the seventeenth and eighteenth centuries, a popular wave of optimistic and progressive thinking spread across the European world culminating in the idea of **secular progress**.¹ This new way of thinking, associated with the rise of **modernism**, derives from a series of historical developments beginning at least as far back as the High Middle Ages. Although this new way of thinking would challenge the dominance and validity of religious views in the West and provide a different approach to the future – in fact, the term “secular” means without association or connection to the religious or spiritual – certain key elements of its origins can be found in Western Christianity.

First let us get a quick overview of the social and philosophical transformation that took place during the rise of modernism. Modernism is both a philosophy and a way of life. It is a multi-faceted reality, connected with profound changes in technology, habitation, economy, politics, and culture, that has altered all aspects of human life especially over the last few hundred years. Although modernism began in Western Europe it has since spread across many areas of the world.

According to Steven Best and Douglas Kellner, the philosophy of modernism and secular progress arose as a consequence of a series of revolutions in thought and social organization, beginning with the Renaissance (ca. 1400 – 1500), and proceeding through the Age of Exploration and Colonization (ca. 1500 – 1800), the Scientific Revolution (ca. 1600 – 1700), the Age of Enlightenment (ca. 1700 – 1800), the emergence of capitalism and democratic states, and culminating in the Industrial Revolution (ca. 1750 – 1900).²

Walter Truett Anderson provides a succinct description of the change in mindset that emerged across this series of revolutions in thinking. The present increasingly was seen as the beginning of a new and different future rather than a repetition of the past and the decay and disintegration associated with it.³ Modernism is hope for the future; modernism is forward thinking.

Shlain attributes the rise of modernism to the invention of the printing press in 1454 and the spread of literacy through Europe. Increased literacy stimulated great changes in science, philosophy, politics, and art, and in particular, instigated a reaction against superstitious, magical, and religious thinking in Europe. According to Shlain, five great abstractions of thought emerged in the literate west: imageless deities, abstract laws, speculative philosophy, mathematics, and theoretical science.⁴ The last four abstractions were especially critical to the triumph of modernism in the West.

Along similar lines, Paul Ray and Sherry Anderson describe modernism as a cultural triumph over the authoritarian rule of medieval political and religious systems in Europe. They see the roots of modernism in European intellectualism, which grew as a consequence of the printing press and increasing literacy, burgeoning urban centers, the growing power of a merchant class, new economic and political systems, science, and the triumph of individualism. According to Ray and Anderson, Europe transformed from a God-centered world into a money and time-centered reality.⁵

Nisbet, on the other hand, traces secular modernism further back to the thirteenth century and the “Age of Inventiveness” (as he refers to it). During this period, humanity first strongly expressed the belief that nature could be mastered and controlled, a key theme within the theory of secular progress. Also during this period, we see the beginnings of the modern work ethic and a significant rise in industrial and mechanical invention. Further, the philosophy of individualism became increasingly popular and there was a heightened interest in politics, economics, and society, all secular concerns as opposed to the otherworldly concerns of the Christian church.⁶

Finally, Watson, reviewing different theories of the rise of the West in modern times and pushing back the origins of modernism even further, argues that the key period that instigated the great transformation in thinking in Europe was 1050 – 1250, that the key event during this time was the rediscovery of Aristotle and his naturalistic and scientific philosophy, and that the central emerging theme was individualism.⁷ Of special relevance to the history of future consciousness is that increasingly people came to believe in individual power and control over the creation of the future.

The historian David Christian, drawing on a vast and rich array of contemporary historical research, states that there is no single “consensual” explanation of the rise of modernism. Yet he does outline certain basic facts and conclusions that emerge from his review of a large range of books and articles.

First, contrary to the “Eurocentric” descriptions of the emergence of modernism, it was a global phenomenon, involving the contributions of nations and cultures around the world. Modernism first blossomed in Western Europe, but its causes were global and its consequent effects have been global. Still, according to Christian, the spark ignited in sixteenth century Europe during the beginnings of the Age of Exploration. Western Europe became the new hub of economic and informational exchange, connecting East with West, from the Americas to Asia, and benefited from the great flow of ideas and products that converged upon it from around the world. Western Europe took the lead in industrial production, technological development, and economic and military power and first “crossed over” into the modern way of life. Yet since the nineteenth century the philosophy, lifestyle, and technology of modernism has spread out across many other areas of the globe outside of Europe, in particular, North America, Australia, and much of Asia.

A second major point is that the central distinguishing feature of modernism is the accelerative growth of innovation in ideas, technologies, products, and social practices. World wide population growth accelerated, as did

agricultural and industrial production, energy output and resource utilization, global commercial exchange, communication and information exchange, and the accumulation of knowledge. All these accelerative changes, which became especially pronounced in the eighteenth and nineteenth centuries, seem to have been caused by increasing innovation. Humanity became increasingly inventive during the rise of modernism.⁸

The increasing rate of innovation appears to be tied to two significant factors – exchange and competition. To recall, Bloom lists reciprocity as one of the two key forces that knit the modern world together, and conquest as the other major force. In the centuries preceding the rise of modernism, networks of commercial and information exchange evolved and spread across the Eastern Hemisphere, from China, to India, to the Islamic Empire, Africa, and Europe. The increasing rate of innovation, Christian argues, comes with increased sharing, cross fertilization of ideas, and in general, a building up of economic and informational reciprocities. Secondly, due to a widening sphere of potential markets and potential competitors, economic competition intensified. Competition stimulated innovation, which stimulated more competition and so forth.⁹ The significance of competition as a driving force behind growth and change did not go unnoticed by writers and thinkers living during the rise of modernism. As I describe in this chapter, the idea that competition stimulates growth and evolution became a central theme within both economic and scientific theories of progress in the eighteenth and nineteenth centuries. The value of competition became a key theme in the Western modernist approach to the future.

Given the rapid economic, technological, and social growth occurring in Europe during the eighteenth and nineteenth centuries, it is not surprising that the philosophy that emerged in Europe at this time emphasized the theme of progress and advancement. A philosophy of growth emerged in a society that clearly was, in fact, growing by leaps and bounds. It is easy to be optimistic about the future when things are going well.

As can be seen from this brief introductory overview, there are many historical roots to modernism and, as Christian notes, varied interpretations of its causes. But it is clear that a significant and pervasive transformation took place beginning in Europe and then spreading around the world. The rise of modernism was, however, by no means a simple linear progression from one view of the world to another. There were surges forward, followed by roadblocks, counter-reactions, and temporary retreats. But there is a general pattern that emerges.

Let us begin the story of the rise of modernism in the High Middle Ages (ca. 1000 AD to 1300 AD). At the beginning of this period, the most important centers of new ideas and inventions were China, India, and Islam, rather than Europe.¹⁰ But as Watson argues, it was during this period that a transformation in thinking took place in Europe, connected with the rise of individualism and the rediscovery of Aristotle, which would catapult Europe ahead of Asia in the centuries to come. Two key features of the modern West and its approach to the future are its emphasis on a secular as opposed to a religious vision of the future, and its emphasis on individual freedom and self-determination in the creating of the future, as opposed to the teleological and God-directed conception of the

future contained in pre-modern Christianity. The emergence of these features of Western modernism can be traced back to the High Middle Ages.

Many factors contributed to the rise of individualism in the High Middle Ages. As Polak notes there was a general reactionary trend against theological dogmatism and the power hierarchy of the church. Against the other-worldliness of Christianity, there was an increasing emphasis on life on earth; among the common people the themes of both social utopianism and utopian socialism became more attractive and powerful. Against the power structure of the church, there was a growing call for more intellectual freedom. As Watson recounts, in the Dark Ages there was less of a sense of individuality and of an individual inner life, but this changed in the High Middle Ages; more emphasis was placed on the self and emotional expression, there was a greater concern with privacy, and autobiographies became more popular as did literature and stories about love.¹¹

One source of the growing individualism in Europe came from within Christendom itself. Papal and clerical authority was under attack and various “heresies” arose during this period challenging orthodox church doctrine. Of special relevance to the history of future consciousness, the famous mystic priest Joachim of Fiore (1132 – 1202) proposed a theory of history and the future that attacked the authority of the Papacy. According to Joachim, human history is divided into three periods: Early history as chronicled in the Old Testament – the age of Flesh and God the Father; recent history as described in the New Testament – the age of both Spirit and Flesh and God the Son; and finally, the future age of pure Spirit – dominated by God the Holy Spirit. Based on his reading of *The Revelation*, Joachim prophesized that the age of the Holy Spirit would begin in 1260 AD and predicted that monumental changes would occur as a result of passing into this new age. Human civilization would be transformed and, according to Joachim, the Christian Church would lose its power and disappear during the age of the Holy Spirit. (It would no longer be needed to control the spiritual lives of individuals.) Interestingly, Joachim and his followers came to believe that the Pope, in fact, was the prophesized Anti-Christ and the Vatican had become the modern Babylon (as described in *The Revelation*).¹²

But if heresies and criticisms of the Church expressed an independence of thought during this time, there was an equally strong counter-movement from within the Papacy to reassert its control and authority. Popes, such as Gregory VII (1020 – 1085), “the Julius Caesar of the papacy,” Urban II (1042 – 1099), who initiated the First Crusades, and Innocent III (1161 – 1216), attempted to strengthen papal control and authority over upstart kings and secular rulers in Europe, as well as the general population. These highly authoritarian popes of the eleventh and twelfth centuries saw themselves as above anyone and everyone - (Innocent described himself as ‘half-way between God and man’) - and tried to enforce a centralized thought control over the people of Europe, using the threats of ex-communication and eternal damnation to keep both kings and common people in line. Out of these Papal efforts to control the minds and behavior of individuals arose a great inquisition in the following century. What is fascinating is that the strongest and most aggressive efforts of the Papacy to

dominate European culture and the European mind occurred in conjunction with a growing dissatisfaction with and reaction against the authority of the church – absolutist centralized control and pluralistic individualism existed in a state of mutually escalating tension and conflict. Yet, as Watson notes, in the coming century the authority of the Papacy would plummet, never to return to the apex of power it had achieved in the eleventh and twelfth centuries.¹³

This conflict of authoritarian popes and the centralized church versus heretics, kings, and individual expression is highly representative of a general theme and trend that would run through the coming centuries. The growth of modernism, as manifested through the emergence of secular philosophy, mercantilism, and science repeatedly involved clashes between the Christian church and the newer ways of thinking and living. All along the way, Christianity, and Catholicism in particular, has repeatedly resisted modernism.

Another significant development, connected with the rise of individualism in the High Middle Ages, was the emergence of universities in cities and towns such as Paris, Bologna, Naples, and Oxford. In these early centers of learning, which over time became increasingly secular in their academic orientation, open debate, criticism and doubt, and the principles of logic and reasoning emerged as guiding principles of inquiry and study. The study of logic, in particular, was stimulated by the reintroduction of Aristotle and his works beginning around 1050 AD. In Paris especially, there was, over the years, significant growth in academic freedom of expression. Additionally, there was a burgeoning sense of optimism associated with these new centers of knowledge based on the belief that humans were capable of understanding the universe and mastering and controlling the world. (Such a belief system would be the cornerstone of the European Enlightenment six centuries later.) Overall, there was a shift from focusing on the past to forward looking and creative inquiry. And finally, it should be mentioned, reinforcing the point made in the previous paragraph, that once the ideas of Aristotle gained sufficient popularity and appeared to threaten the sovereignty and validity of Church doctrine, he came under attack from the church. Repeatedly, (for example, in 1231, 1263, and 1277) his books were banned and individuals who read or supported his non-Christian ideas were threatened with excommunication.¹⁴ But in spite of such sanctions against Aristotle, his ideas would have a great impact on scholars in the universities and significantly contribute to the undoing of the authority of the Christian church.

In this regard, it was at the University of Paris in the thirteenth century that a momentous meeting of minds took place that would have a great effect on the further development of European thinking, and it involved Aristotle. The famous German theologian Albertus Magnus (1193 – 1280) brought his young new Italian student St. Thomas Aquinas (1225 – 1274) to Paris to teach him Christian theology but also Aristotelian philosophy. Albertus firmly believed that Christian thinking could be integrated with Aristotle. He argued that there were, in fact, multiple paths to the truth – scripture, logic, and empirical observation. For Albertus, Aristotle provided a way to approach the truth through logic and naturalistic observation.¹⁵ Aquinas, inspired by his mentor and teacher, would continue and expand greatly on this line of thinking.

Christian Scholasticism in thirteenth-century Europe reached its intellectual apex in the writings of St. Thomas Aquinas. In his masterwork, the *Summa Theologica*, Aquinas created a unified and comprehensive philosophy of God, reality, and humanity. In the centuries that followed, Aquinas became recognized as the greatest and most influential thinker in the history of Christianity. Although his Christian philosophy was founded on faith in the revelations and stories of the *Bible*, he also acknowledged and defended the central importance of reason and natural observation as well. One of Aquinas's main goals in writing the *Summa Theologica* was to reconcile the rationalism of Aristotle with the faith and revelation-based authority of the Christian church. In achieving this philosophical synthesis and reconciliation, he officially approved and opened the door within Christendom to reason and naturalist observation as legitimate paths to the truth.

In many respects, Aquinas embraced Aristotle. He supported many of Aristotle's main theories and invoked and used many of Aristotle's central concepts and arguments. Contrary to previous Christian thinking which had downplayed the importance of the natural world, Aquinas saw great value in understanding and appreciating nature – clearly an Aristotelian sentiment. Aquinas supported the exercise and development of the intellect – the human capacity of thinking should be reinforced rather than repressed. In opposition to St. Augustine, Aquinas saw our present existence on earth as important and valuable, rather than evil and inferior. In essence, Aquinas assimilated the rational and naturalistic optimism of Aristotle into Christianity, or perhaps, as some would say, he assimilated Christianity into Aristotelianism.¹⁶

There were important things happening at Oxford as well. According to Watson, Oxford was particularly strong in mathematics and the natural sciences. Science, of course, in the modern sense had yet to emerge as a significant social and intellectual movement, but two teachers at Oxford, Robert Grosseteste (1168 – 1253) and Roger Bacon (1214 – 1294) anticipated and would later influence the development of science and technology. Both Grosseteste and Bacon were well acquainted with Aristotle. Grosseteste, based on his extensive study of Aristotle, appears to have understood how induction and deduction, as complementary forms of logical reasoning, apply to the study of nature. In addition, Grosseteste outlined the significance of analysis in scientific observation and even provided a clear description of hypothesis testing and science experimentation. In essence, Grosseteste anticipated the fundamentals of modern scientific methodology and epistemology – the set of procedures and activities that would provide an alternative pathway to knowledge than that offered by tradition and authority or revelation. If Grosseteste described some of the main principles of the scientific method, Bacon followed through and attempted to practice these principles. Though Bacon is also known for being a mystic who was interested in the occult, alchemy, and astrology, he was foremost an advocate of science as the pathway to the truth. Bacon was very familiar with the great accomplishments of Arab science and attempted to practice the experimental method in his multifarious investigations of nature. He strongly attacked the blind acceptance of authority and believed that science

would provide the way not only to gain mastery over nature, but to transform the world in the future. He was, in fact, the great futurist visionary of the High Middle Ages. Bacon predicted such modern technological developments as the microscope, telescope, eyeglasses, automobile, submarine, flying machine, and steam ship.¹⁷

Due to the opening of the European mind to scientific and secular approaches to knowledge and truth, a philosophical dualism (a “double truth universe”) emerged in the West that to the present day still exists.¹⁸ Aquinas and Albertus, among others, were willing to accept the rational and naturalistic ideas of Aristotle and the ancient Greeks alongside the mystical, mythological, and faith based ideas of Christianity. Aquinas thought that the core ideas and beliefs of these two approaches were compatible or consistent with each other, but the methods are clearly different. Aquinas hoped for a peaceful co-existence. In the centuries after Aquinas, however, the tension between the religious and the secular-scientific worldviews would grow as new ideas emerged in the latter approach that clearly seemed to challenge Western religious doctrine. Not only did a new vision of reality emerge in science, but a new vision of the future developed, and ultimately the value and validity of faith, revelation, and myth came under attack. But the tension, as noted, still remains, for religious thinking about reality and the future has not gone away; it co-exists along side the secular and the scientific. Contrary to the dream of Aquinas, the modern West lives in a dualistic world, a house divided against itself – with two contrary views of reality and the road to the future.

Even if the High Middle Ages achieved a high level of intellectual and theological order in the writings of Aquinas and other scholastic thinkers, Europe, in the time of Aquinas, lagged far behind both the Islamic Empire to the southeast and China and India to the Far East economically, technologically, and socially. A vast network of trade and exchange from the Middle East to China had emerged by 1200 AD, and both China and Islam were centers of commerce, industry, science, technological innovation, and intellectual activity. As noted in the previous chapter, the power and presence of Islam, in particular, was clearly felt in Europe, and the re-introduction of Greek philosophy and science to European thinking was due to Islam. While Islam and China had formed vast political and social empires, Europe, though dominated by Christianity, was politically fragmented throughout much of the Middle Ages.

Yet, in one significant respect, Europe and Asia were similar. Though at that time the biggest cities in the world were in Islam, China, and India, the overwhelming bulk of the world’s population was still rural and pastoral rather than urban. One of the central trends that emerged with the rise of modernism was accelerative urbanization (a trend that is still continuing today); one could say that urbanization is both a cause and result of modernization – urban centers intensify innovation and provide for all the perceived benefits and opportunities of modern life. In the Middle Ages though, pastoral groups regularly unsettled agricultural and urban communities across the globe; (the spreading reign of terror and conquest by Genghis Kahn and the pastoral Mongols is the most

dramatic example from this period). The balance of power was clearly not with the cities, but this would change in the centuries ahead.¹⁹

If thirteenth-century Christian Scholasticism was in many ways a high expression of an Apollonian mindset and a tradition-bound social order, the “calamitous” fourteenth century in Europe was filled with “sound and fury,” Chivalric romanticism, and a heightened Dionysian quality. It was an era of passion, of love and war, of the Great Plague or “Black Death” and forebodings of catastrophe, and in particular, an intensifying reaction against the perceived repression and corruption of the Christian church.²⁰ Shlain describes fourteenth-century Europe as dominated by a “hunter-killer” mentality.²¹

At a more global level, after the sustained period of technological and economic development that had occurred in Islam and the Far East for several centuries, progress significantly slowed down around the world. Population growth and production took a down turn. China, in particular, became less open to the outside world. This change would be significant. Though China could have led the way into modernism, perhaps much earlier than in Europe, historical events took a different course. In the next two centuries, while China stayed closed off, Europe opened its doors further and would “set sail” in the Age of Exploration, exposing itself to new ideas, cultures, products, and resources beyond its borders. This was critical to the rise of modernism.

One factor that significantly contributed to the decline of both China and Islam as economic powers was the Great Plague. Although the plague spread throughout Europe as well as Asia and the Middle East, the great trade routes of Islam and China were significantly and disproportionately affected by the plague. European trade routes were not as greatly disrupted. Hence, moving into the fifteenth century Europe was able to capture more of world trade and commerce, which would be a key catalyst behind the flowering of the Renaissance in Italy.²² And more generally, as Bloom and Christian would argue, the degree of openness and exchange within a culture is a critical variable in determining the rate of growth and development for that culture. It was in the fourteenth century, in particular, that Europe started to become the new global hub of interaction and trade.

Contact with new ideas and cultures would have a significant impact on Europe. It instigated increasing openness to alternative modes of thinking and raised skepticism among Europeans regarding their Christian-dominated social order. (This, of course, had begun with the introduction of the ancient Greeks and Islamic science and philosophy in the High Middle Ages.) Opposition against the authority of the Christian church continued to increase in the coming centuries, but the church stayed entrenched in its ways. According to Shlain, the Papal-dominated church of the fifteenth century was totally corrupt, authoritarian, filled with “sins and vices,” and would not reform.²³ First with the Renaissance, and then with the Reformation in the following century, the domination of the church, as well as the medieval way of life, was challenged and ultimately unsettled and transformed.

One could say that the promise of Christian religion, at least as it was espoused and practiced by the medieval church, was left unfulfilled. The “Second

Coming,” though repeatedly anticipated and predicted throughout the Middle Ages, had not arrived as expected; the Black Death seemed to many people to be the end of the world, but clearly not as foretold in the *Scriptures*; and the church, which was the supposed moral leader for humanity, was both internally degenerate and externally embroiled in war and perpetual violence. It was time for a change.

Another significant factor in the shifting of power in Europe was the steady rise of the commercial and merchant class. This change is particularly important in understanding the Italian Renaissance (1400 to 1500 AD). Powerful city states, such as Florence and Venice that were controlled by a wealthy merchant class had developed in Europe in the fifteenth century. Whereas royalty and the church had ruled in earlier centuries, now there was a shift of power from the “other-worldly” to the worldly. Thus, the philosophy of secular progress that later emerged in eighteenth-century Europe was rooted in a world where the social power structure had already been changing from the spiritual to the secular and economic in the preceding centuries. One of the major seeds in the growth of power in the economic sector was the Renaissance city states of Italy. This growth of commercialization was a significant factor in the increase in innovation and the rise of modernism – economic competition stimulated creativity. As Europe transformed in the fifteenth and sixteenth centuries into a society dominated by commercial power structures and commercial values, it laid the foundation for the modern revolution.

Although the artistic creativity of the Renaissance is usually highlighted as the distinctive feature of the era, Watson argues, based upon recent scholarship and study, that the revolutionary nature of the Renaissance was founded upon an economic and commercial transformation. International trade accelerated and blossomed in the Italian city states. The philosophy of capitalism gained increasing power and influence – the free market became a central principle of this new philosophy. There was a revolution in banking and finance. A wealthy class arose which valued the accumulation of material possessions and money. Contrary to the spiritual and other-worldly values of Christianity, this new wealthy class saw meaning and purpose in life through economic growth and material accumulations. But the wealthy class also valued education and literacy and became great patrons of the arts, supporting the elevation of the artist as a new cultural icon. The Renaissance was foremost a great capitalist transformation.²⁴

Technological advance also significantly contributed to the Renaissance. Two of the central values of the Renaissance were invention and imagination, and the period showed great technological innovation. In the previous century, the precise quantification and measurement of space and time significantly advanced. The compass, mechanical clock, gunpowder, and the printing press all emerged as significant technological developments in European life. The creation (or discovery) of the principles of perspective (geometrical projection) was another noteworthy event of the period. The first printed book in Europe, that can be dated, was produced in the year 1457, and printing caught on very quickly thereafter. The number of secular and popular books increased dramatically, challenging the dominance and monopoly of religious texts of previous centuries.

Interestingly, almost immediately, and as a reaction to the distribution of objectionable works, the Church began the public censorship of various books.²⁵

Another significant feature of the Renaissance was the rise of humanism. Humanism provided an alternative philosophy to the spiritualism and other-worldly attitude of the Christian church. Humanism emphasized the importance of individuality and human dignity, earthly existence and values, and the arts, and found its inspiration in classical philosophy and literature, such as in the Greeks. The Italian scholar Francesco Petrarca (1304 – 1374) is frequently identified as the founder of humanism, and along with Dante, one of the fathers of the Renaissance. A poet, who extensively wrote and romanticized on love, as well as the inner life of the human mind, Petrarch, though a devout Christian, found great philosophical inspiration in the ideas of ancient Greece. Perhaps the first person to recognize and label the “dark ages” as a period of intellectual decline, he foresaw a great turning point in the future prospects of humanity.²⁶ The most well-known of the humanists was Desiderius Erasmus (1466 – 1536) who, although ordained as a priest, was highly critical of the traditions, superstitions, and intolerance associated with the Christian church. Erasmus, like others before him, attempted to reconcile the ideas and writings of classical literature and philosophy with the Christian doctrine, but ended up being labeled a heretic. He emphasized individual judgment and conscience over the abstract formalism of Christian doctrine and scholarship and because of his individualistic and critical philosophy was identified as the person who “laid the egg that Luther hatched.”²⁷

If the rediscovery of Aristotle played an essential role in the intellectual achievements of the High Middle Ages, the rediscovery of Plato was equally important to the Renaissance. The ideas of Plato did much to support and reinforce the visionary and aesthetic philosophy of the Renaissance. Although Plato emphasized the eternal and mental realm over the physical and temporal realm, in the Neo-Platonism of the Renaissance, spirit, beauty, and order were seen in everything, and earthly life was consequently viewed as having great value, as well as being intelligible to the human mind – the world was beautiful and it made sense. Further, and quite significantly, as Plato had identified beauty with the good, Renaissance artists and thinkers saw beauty as morally valuable. Art both informs and pleases the human mind, and wisdom was described as the synthesis of beauty and enlightenment. Overall, the Renaissance expressed an aesthetic and moral vision of the future.²⁸

According to Watson, the rise of humanism and the flowering of the Renaissance reinforced and further amplified the growing individualism in the European mindset. The growth of capitalism stimulated individual competition; the emergence of humanistic philosophy intensified self-consciousness and individual conscience; and the fascination, if not worship, of the artistic genius contributed to the increasing interest in the uniqueness of different people. Fame and individual glory became important values. Individual achievement became an important goal in the life of many people. In fact, virtue was re-conceptualized as an individual achievement built on reasoning and planning. The image of the “Renaissance Man” arose – a person of education and varied interests – who possessed a “self-conscious optimism” that life possessed an intelligible order

that could be grasped and understood and directed toward positive ends.²⁹ All in all, the Renaissance greatly contributed to the modern view that the future can be self-determined through individual effort and talent.

Perhaps the most famous example of the “Renaissance Man” was Leonardo da Vinci (1452 – 1519). Considered one of the greatest artists and creative geniuses of all time, Leonardo combined interests in painting, human anatomy, architecture, optics and perspective, engineering, and the study of nature. He synthesized in his work the scientific, technological, and naturalistic with the artistic and humanistic, as, for example, in his detailed studies and drawings of the human body and his work in vision, optics, and the principles of perspective. Leonardo is also a supreme expression of the Renaissance value of human inventiveness. Of special relevance to the evolution of future consciousness, in his “Notebooks” can be found innumerable designs and drawings of mechanical and engineering devices which anticipate technological inventions in later centuries. The first documented design of a mechanical robot can be found in his “Notebooks”. There are also drawings for the construction of a helicopter, tank, submarine, mechanical calculator, car, and solar energy device. In many respects, Leonardo captures the essence and values of the modern mind; his interest and creative inventions in technology, his forward looking attitude, his individualistic lifestyle, his fascination with the wonders of nature, and his great and varied accomplishments all point toward modern values, and away from the past.³⁰

The Renaissance rose up as a dissident counter-culture, an attack on tradition and authority, and a rejection of the philosophy and way of life of the Middle Ages. The writers and artists of the Renaissance called for a “return to the Golden Age” of ancient Greece, a culture filled with secular and non-religious ideas and ideals. With the Renaissance came a renewed belief in the individual, in human freedom and human ability, in reaction to the perceived repressiveness of the Middle Ages. If the Scholastic era was Apollonian, then the Renaissance was Dionysian.

The Renaissance though was a prelude to modernity rather than its beginning. In several important respects it was more regressive than progressive. For one thing, the period of the Renaissance was a time of extreme subjectivism (a necessary accompaniment of its heightened individualism), in some ways much more passionate and Dionysian than rational and Apollonian, and filled with magical belief systems and occult practices. When modernity does arrive, the magical, the occult, the religious, and the passionate would be replaced with the rational and the secular. Moreover, because the Renaissance rejected the mindset of the Middle Ages, the idea of progress as defended in the writings of St. Augustine and other Christian writers was abandoned. Instead, the Renaissance accepted a cyclical theory of time – the goal was to return to a higher civilization represented in the Greeks rather than building upon the accomplishments of the Middle Ages. They were not moving forward; rather they were returning to something better that had existed long ago.³¹ In spite of these pre-modern qualities to the Renaissance, what the Renaissance did accomplish was to oppose and help to further unsettle the authority of the Church, through

both humanistic and economic individualism and the elevation of secular values, and the Renaissance was just the beginning of this revolt.

Two important historical events occurred in the sixteenth century that would significantly impact the growth of modernism in Europe. The countries of Western Europe began to aggressively and competitively explore and conquer the Americas. The Age of Exploration began. Second, the authority of the medieval Church was overturned in the Protestant Reformation. Let us first look at the Reformation.

With literacy spreading throughout Europe after the introduction of the printing press, the Protestant Reformation, led by such figures as Martin Luther (1483 – 1546) and John Calvin (1509 – 1564), openly and decisively challenged the authority and sovereignty of the Roman church. Luther's rejection of the church as an intermediary between individuals and God further reinforced the growing individualism of the West. Instead of having to follow the dictates and directions of the church, which presumably spoke for God, Luther emphasized the importance of inner faith and piety and argued that individuals should read the *Bible* for themselves. Although it might seem paradoxical, given the emphasis that the Christian church placed on Biblical doctrine, the church hierarchy did not want the common people to read the *Bible*; the church wished to maintain control over how to read and interpret their holiest book. When Luther translated the *Bible* into German so that the general population in his homeland could read the *Bible* for themselves, he struck a great blow for individual religious freedom.³²

The Reformation has been described as a "great renewal of religious commitment" and a "moral cleansing" of the vices of the church. According to Nisbet, there was a renewal in the belief in progress, which began in the writings of Jean Bodin (1530 – 1596). Bodin, in fact, attempted to combine the cyclical and linear theories of time, arguing that humanity did not begin in some Golden Age, but rather in a state of primitiveness, and through a process of growth, decay, and renewed growth, had progressed to its present state of development.³³

Yet, the Reformation, like the Renaissance, was in important ways not a progressive movement forward. Luther was decidedly anti-intellectual and pro-faith, in spite of his professed desire that individuals read and study the *Bible*. He believed, as did Calvin, in pre-destination, and both of them were highly superstitious, believing in witches, demons, and evil spirits. Calvin, in fact, was decidedly deterministic about the future, believing that whether one would go to heaven or hell was pre-determined from birth (due to God's omniscience) for everyone. Both Luther and Calvin repressed the rights of women and Calvin, in particular, sought to establish a male dominant authoritarian hierarchy of rule within Christianity. In general, Calvin argued for the strict enforcement of moral rules and supported the centralized control of his new church over the behavior of individuals. Further, the Reformation and Papal Counter-Reformation (which included the Inquisition) led to new religious wars and excessive violence and murder. (The infamous witch-hunts were a product of the Reformation and Inquisition.) Specifically regarding the Counter-Reformation, the Catholic Church reacted to Luther and the Reformation in a manner similar to the way it had

previously reacted to new ideas and threats to its authority – it became more entrenched, rejected Luther and the rise of Protestantism as heretical, and once again banned and censored whatever books it saw as objectionable. In general, although as Watson states, the Reformation was associated with increasing tolerance, there were also many counter-efforts at the same time to re-assert authority, including those of Calvin. Although humanists such as Erasmus opposed the anti-intellectualism of Luther, according to Shlain, it was the authoritarian power of Calvin and his rejection of worldly concerns that stalled the continued rise of secular philosophy and ended the free flight of the Renaissance. One should add that the widespread murder and torture connected with the Inquisition and the witch hunts, instilling fear in so many people across Europe, did not help matters either.³⁴

Still, Europe, coincident with the Reformation, was embarking upon a great geographical and commercial adventure in the sixteenth century. According to Christian, after the economic and social regression of the fourteenth century, a new wave of economic development emerged across Europe and the most significant factor in this upturn was the bridging of the Atlantic in the sixteenth century. The first truly global commercial network of exchange came into existence linking the Americas to Europe and the rest of the world. Products from the Americas, including silver, tobacco, and a variety of new foods found their way across through Europe and across the Eastern Hemisphere and, in turn various products, animals (the horse for example), and quite destructively, for the indigenous people, new germs found their way to the Americas. The hub of economic exchange shifted from the Middle East to Western Europe. Again, following Christian's logic, exposure and increasing exchange of information and commercial products were critical stimulating factors behind a new wave of innovation in the sixteenth and seventeenth centuries. As a prelude to the rise of modernism, Western Europe became the center of a rich global "open system" of trading and interaction that for the first time encircled the world.

Watson also concurs that the discovery and exploration of the Americas was of immense significance in the economic, social, and intellectual rise of Europe. It was the final key factor (in the period of 1050 to 1500 AD) that moved Europe, and in particular, Western Europe, ahead of the rest of the world. Not only did the Americas provide tremendous new resources and products, as well as a growing market for European goods, its discovery had a significant intellectual impact on the Western mind. The discovery of these new lands and new people had been totally unexpected and it altered the European mind's conception of the earth, of space, and of culture and history. How did the American Indians fit into the grand scheme of things? As Watson notes, encountering these new people and their cultures stimulated the beginnings of an evolutionary theory of culture.³⁵

It should also be noted that during the same period that Western Europe was exploring and settling the Americas, it was also pushing outward in other directions, exploring Africa, reaching India, and culminating with the historic voyage of Magellan, circling the globe. Western Europe not only settled the Americas, but conquered and colonized many other parts of the world, bringing

diverse other peoples and cultures into its economic and political web. Modernity begins with Europe's economic and political globalization of the world.

With the Age of Exploration, European nations entered into a period of fierce competition as first the Americas and then other parts of the world were explored and often conquered in the process. Competition among Spain, England, France, and Portugal fueled innovation in navigational and military technology. And following Bloom's logic, just as the creation of economic reciprocities helped to knit the world together, the wave of conquest and colonization pulled the resources of many parts of the world together under the control of Western Europe. Europe became the center of military and political power as it became the center of trade and exchange.

Christian argues that England was especially primed to enter into this new era. The rural population of England had been over the previous centuries increasingly pushed into employment in urban areas to survive. They were being pulled into the web of commercial exchange centered in the cities. "Proto-industrialization" was developing across England during the seventeenth century as a prelude to the Industrial Revolution a century later. Competitive capitalism had become the dominant economic system throughout England.

England would become the first nation to clearly move into the modern era. Technological innovation accelerated in England during the seventeenth century. Cities became the unequivocal centers of power. Capitalist commercialism reinforced and solidified secular and competitive values. Wealth and production escalated as England utilized the resources and populations of the many diverse lands that were swallowed into its growing global empire.³⁶ England, in particular, was primed for the final significant event in the rise of modernism that "lit the fuse."

The Scientific Revolution

*"Copernicus, Kepler, and Galileo put in place the dynamite
that would blow up the theology and metaphysics of the medieval world.
Newton lit the fuse.*

Neil Postman

*"This most beautiful system of the Sun, planets, and comets, could only proceed
from the counsel and dominion of an intelligent and powerful Being."*

Isaac Newton

While the Reformation and Counter-Reformation were spreading across Europe, something less violent, less boisterous, but ultimately more earth shattering was emerging in the minds of men. Nicolaus Copernicus (1473 – 1543) published his famous theory that the earth was not the center of the universe but actually revolved around the sun. Galileo Galilei (1564 – 1642),

following the lead of Copernicus, discovered the moons of Jupiter and the rings of Saturn, formulated the beginnings of modern physical science in opposition to the authority of Aristotle, and openly challenged the authority of *Genesis* as a correct account of the origin and nature of the universe. And Johannes Kepler (1571 – 1630), co-inventor of the telescope, discovered the laws of planetary motion, further reinforcing Copernicus' theory, as well as setting the stage for Isaac Newton's grand scientific synthesis later in the century. Though the historical development of science can be traced through the ideas of the ancient Greeks, the investigations and studies of Islamic scholars, and the writings of Grosseteste and Roger Bacon, among others, modern science was born in the sixteenth and seventeenth centuries. The Scientific Revolution found rational and mathematical order within the changing world of nature and time, and ultimately, without having to resort to the hypothesis of God.³⁷

In the centuries ahead modern science would increasingly challenge not only the authority of the Christian church, but almost all religious beliefs and practices worldwide. Science began to formulate a new explanation and understanding of nature and reality. Eventually it overturned both mythological and religious stories of the origins of the universe, as well as traditional histories of nature and humankind. Further, it provided a new way of thinking and a new method for investigating nature – the scientific experiment. Finally, it laid the theoretical seeds for a new view of the future – the theory of secular progress. Although there were some notable connections between Western religion and science, as well as ancient Greek philosophy and science, a distinctively new belief system and approach to reality emerged in the Scientific Revolution during the sixteenth and seventeenth centuries.

Watson asks why the Scientific Revolution occurred in Europe as opposed to Asia or the Middle East. According to Watson, the rise of individualism (encouraging freedom of thought and inquiry), the increasing emphasis on quantification and precision, and the materialistic and competitive nature of Western capitalism all contributed to creating a favorable climate in Europe for the beginnings of science. Although there were as many scholars in Islam or China as in Europe during the period of the High Middle Ages, the former two societies had centrally controlled intellectual cultures, whereas European intellectual culture was more open, individualistic, and critical. All in all, it seems clear that the philosophy and practice of freedom of inquiry and individualistic competition were critical factors in stimulating the growth of science in Europe.³⁸

The spirit of openness and freedom of inquiry associated with the rise of modern science would eventually lead to tension and conflict between science and the Christian church. When Copernicus first published his theory of the heavens, the church did not react critically to it. In fact, church leaders responded favorably to Copernicus's theory, treating it more as a valuable and interesting system for making astronomical calculations and predictions than as a theory that made claims about the nature of reality. But as time went by, the implications of Copernicus's theory became clearer and more unsettling. According to Copernicus's heliocentric theory, humanity was no longer at the center of the universe, a theory that seemed to contradict certain passages in the *Bible* about

the nature and creation of the universe. Eventually, the Christian church found the ideas of Copernicus objectionable and when, in the seventeenth century, Galileo aggressively defended Copernicus, arguing that the *Bible* contained errors concerning the cosmology and the heavens, the church branded Galileo a heretic, forced him into recanting his views, and imprisoned him.³⁹ As had frequently occurred in the past, the Christian church aggressively attempted to suppress ideas that challenged its sovereignty and hold on the official truth.

One of the most important features of the theory of Copernicus was that it exposed a deep egocentricity and narrowness of point of view in humanity's conception of the universe. Because we observe the sun, the stars, and the planets relative to our position on the earth, it "appears" as if the sun circles around the earth and the stars and planets rotate in the sky. It appears that we live at a stationary center point in the cosmos. Yet, this appearance is due to a limited and local perspective on the nature of things. As science advanced in the centuries ahead, humanity would discover still other ways in which our view of nature and the universe was limited and egocentric. To recall from earlier chapters, a critical feature in the evolution of consciousness has been the movement from the egocentric to ever expanding vistas in space and time. The theory of Copernicus was a highly significant step in this ongoing evolutionary process.

As modern science progressed it would challenge and overturn many traditional and common beliefs about reality. But what is important to see is that these new ideas derived from a new emerging methodology for studying and understanding nature. The origins of the new philosophy of scientific method, as well as the modern secular notion of progress, can be found in the great early promoters of science, Sir Francis Bacon (1561 – 1626) and Rene Descartes (1596 – 1650). Bacon first articulated the empiricist philosophy of science and Descartes became the great advocate of the rationalist theory of science. Both openly questioned all the beliefs passed on to them from tradition and the past, and both supported a progressive view of history and the future. In particular, they both saw science as the way to continued progress in the future.⁴⁰

The contemporary scientist, E. O. Wilson believes that Francis Bacon was the critical figure in the rise of modernism and modernism's supreme philosophical expression in the Age of Enlightenment.⁴¹ Bacon proposed that all past beliefs which were ungrounded in fact or reason should be rejected. He referred to these unsubstantiated beliefs as "idols of knowledge." He proposed a new method that would liberate humanity from these idols – a method that was rational and based upon fact. Specifically, he formulated the principle of **induction**, where knowledge should be based upon generalizations of observed facts. Instead of consulting religious authority or basing one's beliefs on faith, one should directly investigate the natural world as the method for gaining knowledge.⁴² Bacon called for a "Great Instauration" – "a total reconstruction of the sciences, arts, and all human knowledge, raised upon the proper foundations".⁴³

Bacon though did not see science and scientific knowledge as an end in itself. Rather, science should serve as a foundation for the improvement of

humanity.⁴⁴ Through understanding nature, one could control nature, and through the control of nature one could improve human life. Bacon was a pragmatist – for him “knowledge is power.” To quote, “Knowledge and power come to the same thing for nature cannot be conquered except by obeying her.”⁴⁵ This pivotal idea that humanity could improve natural reality, as well as human society, through the application of scientific knowledge was at the core of the secular approach to the future and the concept of secular progress.⁴⁶ Through human reason and scientific principles, the future was something that could be positively directed. Progress could be achieved through scientific methods. This new philosophy was an incredibly powerful idea that eventually transformed the Western world.

Instead of focusing on spiritual improvement and spiritual ends through spiritual means, Bacon was proposing the use of secular or scientific means to achieve natural or secular ends. In fact, Bacon envisioned an ideal world ruled and controlled by science and scientists in his utopian book, *The New Atlantis*. This vision was not specifically set in the future, but it was clearly not an otherworldly or spiritual reality.⁴⁷

The great scientist, mathematician, and philosopher Rene Descartes proposed a second method for achieving scientific knowledge. Where Bacon focused on the generalizations of observations and facts, Descartes focused on rationality or reason. Descartes, like Bacon, wished to free himself of the false and ungrounded beliefs of the past, and decided to begin by doubting everything he believed, including the existence of an external physical world. In his famous insight “I think therefore I am” he found something he could be certain of – his own existence as a thinking being - and proceeded from this starting point to deduce a variety of other conclusions. Descartes argued that he would only believe what he could form “clear and distinct ideas” about and what could be rationally deduced through reason. (Note that “I think therefore I am” is a rational deduction – the conclusion logically follows from the premise.) Descartes believed that scientific knowledge should be built upon rational deductions.⁴⁸

Though Descartes wished to identify a sound methodology for the acquisition of knowledge, it is important to see that his starting point is doubt. Bacon also begins from a critical attitude regarding traditional beliefs. As part of the growing freedom and openness of inquiry in sixteenth century Europe, philosophical skepticism was becoming an increasingly influential idea. Descartes’ contemporary, the French essayist Michel de Montaigne (1533 – 1592), was especially noted for his skeptical attitude regarding all human beliefs and customs. In the spirit of scientific empiricism and naturalism, Montaigne was especially critical of supernatural and other-worldly ideas, and in resonance with Bacon’s view of the function of human knowledge, Montaigne argued that knowledge, instead of being used as “the preparation of man for a safe death,” should be used to improve our earthly life and existence.⁴⁹

Returning to Descartes, he also helped to clarify the concept of natural or scientific laws, proposing that the universe could be completely described in terms of mathematical laws. (Galileo and Kepler had formulated their physical and astronomical laws in terms of mathematical equations.) Wilson sees this insight as supporting the idea of the Enlightenment that all human knowledge can

be unified – in this case through mathematics. Further, anticipating Newton, Descartes argued that the universe was fundamentally a machine; hence Descartes is the beginning of the modern “**mechanistic**” model of nature. The mechanistic model would provide a key idea in theories of secular progress. Just like a man-made machine can be constructed to serve human goals, both nature and human society could be viewed as machines and manipulated to serve human ends.⁵⁰

Morris identifies Descartes as the beginning of the idea of secular progress. Not only did Descartes clarify many important concepts of early science and attempt to distinguish scientific knowledge and scientific ends from superstitious and unscientific ideas of the past, he also entertained the idea of natural evolution and progress. He suggested that the universe had evolved, due to the laws of nature, from a primordial chaos but he ultimately rejected this hypothesis because it seemed to him to contradict *Genesis*. He did believe, as did Bacon, in future human progress through the advancement of science.⁵¹

As noted earlier, Western Europe in the sixteenth and seventeenth centuries had become the hub of economic and informational exchange for the world. Western Europe also explored, and in many cases conquered, many different regions of the world, and thus was exposed to numerous and diverse cultures. This access to different ideas and products loosened the monolithic hold of the Christian Church on people’s minds. Bacon, Descartes, and Montaigne are illustrative of the skepticism that entered into the minds of Western Europeans regarding their own cultural traditions and beliefs. But further, not only did the European mind become more open toward different views of the world, it also became more competitive in assessing and judging the validity of these different views. Christian argues that the Western European mindset had moved increasingly toward a competitive approach to life and away from a tributary and obedience-driven way of life. Openness to different ideas lead to competition among ideas for there was no longer just one view dominating the scene. On what basis was one to evaluate and decide among different points of view? Bacon and Descartes provided methods for evaluating and comparing different knowledge claims – through direct observation and reason. Both Bacon and Descartes were highly critical of many common beliefs of popular and traditional culture. Ideas could no longer simply be upheld and supported because of religious, cultural, or royal authority. Ideas had to be subjected to the methods and scrutiny of science. According to Christian, beliefs were now tested and debated in the “market of ideas.” Science was born in a world of openness, exploration, and competition.⁵²

Aside from induction and deduction and the use of mathematics, one other key feature of scientific methodology needs to be identified and described. According to Watson, one of the most influential ideas in the history of humanity is the “scientific experiment.” Scientific ideas (hypotheses or theories) can be empirically tested through experimentation. In essence, if a scientist has a question concerning nature, a scientist can ask nature for an answer. Through the direct manipulation of nature, in the form of an experiment, a scientist can observe what effects appear to follow and thus gain an understanding of the

workings of nature. Experimentation would become a central and defining activity in modern science, giving science, according to Watson, a democratic quality. If scientists disagree on some issue, the question can be put to the test through experimentation. Whereas previously, differences of opinion were settled through consulting and interpreting authoritative texts, through logical argumentation, and frequently through intimidation and suppression, disagreements could now be (hopefully) resolved empirically in a fair and objective fashion by manipulating and observing nature.⁵³ Attempting to understand nature, as well as control it through the use of experimentation represents a significant advance in human thinking and behavior and without question had a great impact on how humanity approached the future. At least within the scientific community, as we move forward into contemporary times, predictions about the future and decision making concerning the future increasingly has become grounded in experimental data and results.

Interestingly, in the midst of increased openness and competition among different points of view, one theory emerged that came to dominate early thinking in science. The Scientific Revolution culminated in Sir Isaac Newton's (1642 – 1727) theory of mechanics, motion, and gravitation which seemed to provide a comprehensive scientific explanation of the physical universe. It appeared that nature could be completely understood through reason, mathematics, and generalizations of observable facts – the dream of Bacon and Descartes. Newtonian science provided the theoretical foundation for the Industrial Age and inspired the philosophy that human society could also be modeled on unifying and comprehensive scientific principles and controlled through the application of these principles.

Newton described the physical universe as discrete, solid objects of matter moving through empty space. Material objects influenced each other through material forces. (In many ways Newton's physics is similar to the theory of the Greek atomist Democritus.) The motions of objects and the effects of physical forces were governed by stable laws of nature. The universe, as a whole, behaved deterministically and the motions of all physical objects, earthly and heavenly, could in principle be calculated out indefinitely into the future.

Further, in his physics Newton transformed the concept of time. To recall, the ancients usually associated time with deities, archetypes, and concrete dimensions of reality (such as the rising and setting of the sun or the changes in seasons). Newton proposed an abstract and absolute concept of time – totally disconnected from any concrete manifestations. Absolute time flows throughout the universe independent of specific events in nature.⁵⁴ Newton's concept of time is one example of a general trend in science to describe the world in the most abstract terms, devoid of personification, cultural or personal bias, or concrete metaphors or associations.

Also, in one important respect, Newtonian physics connects the heavens and the earth. Kepler, in his discovery that the planets moved around the sun in elliptical orbits, had demonstrated that the heavens were not "perfect," in contrast to the accepted belief that heavenly bodies presumably all moved in circular orbits – the circle being the "perfect" geometrical form. The dualism of the Middle

Ages had separated, in a Platonic fashion, the imperfect and corruptible earth from the perfect and eternal heavens above.⁵⁵ Building on Kepler's insight and discoveries, Newton demonstrated that the same physics that applies to the earth also applies to the heavenly bodies above. His laws of mechanics united and comprehensively covered all of observable nature. Newton "demystified the heavens."⁵⁶

Yet Newton also maintained a strong Platonic element in his thinking. Newton believed that the laws of nature presumably existed since the beginning of time. The laws of nature are permanent and stable. Early scientists, such as Newton, believed that the laws of the universe had been created by God and imposed upon nature from "above." Order was stamped upon the natural world of flux. The contemporary scientist and cosmologist Lee Smolin sees Newton as following Plato, in this regard, postulating eternal laws created and dictated by an eternal creator. What is eternal gives order to time.⁵⁷

The central metaphor of the Newtonian view of the universe was the clock. Both Descartes and Newton replaced the earlier idea that nature was like a living organism – filled with spirits - with the idea that nature was a machine.⁵⁸ Nature was de-personalized and objectified. The mechanical universe had been set and ordered at the beginning of time by God and, like a clock or perfect machine ticking away at a regular and predictable rhythm, moved in a totally lawful way. Increasingly, during the Industrial Era, human society was modeled on the metaphors of the clock and, more generally, the smoothly running activities of a deterministic machine.⁵⁹

Hence, although science brought with it a spirit of open inquiry and a rejection of authority, science also created a new system of belief that emphasized order, lawfulness, and integration in nature, as well as in human society. We will see that this same philosophical dualism of freedom and openness versus order and unity would permeate through other aspects of secular modernism as well.

The principles of science were not only applied to physics and astronomy, but all other dimensions of nature as well. Andreas Vesalius (1514 – 1564) and William Harvey (1578 – 1657) made significant scientific advances in the study of human anatomy and physiology, including Harvey's epochal discovery and explanation of the circulation of blood and the pumping action of the heart. The father of microbiology, Anton van Leeuwenhoek (1632 – 1723) with the newly developed microscope discovered a whole new realm of the very small – protozoa, bacteria, and many other microscopic forms of life - again demonstrating that our everyday view of reality was very limited.⁶⁰

Although most early scientists believed in the Christian God, there was a growing sense that with the emergence of science a revolution in thinking was taking place. When the Royal Society of London was founded (1660 or 1662), its purpose was to defend and support the "new experimental philosophy." Newton would become President of the Society in 1703. According to Watson, by the time of Newton, a great shift in intellectual standards had occurred. Theology had been pushed out of its central position in academia and instead of providing the

standard against which beliefs were judged, science had now become the new standard against which theology was judged.⁶¹

At this point, let us look more closely at the concept of scientific or natural laws, a pivotal idea in the new way of thinking and theory of order that emerged in science. The scientific concept of natural laws has great relevance to the view of time and the future that emerged in modern science.

The modern scientific concept of a law of nature derives from the ancient Greeks. A law of nature is a general pattern of change. To recall, for Heraclitus, change was pervasive through nature. Plato, following Heraclitus, believed that within the natural world all was in flux. For Plato, stability and permanency was only to be found in the eternal forms. To whatever degree there was order in the physical world of time, it derived from the order given to it from the eternal realm of forms. We have already seen how Newton applied this Platonic idea to his concept of laws of nature.

However, Heraclitus suggested that although everything in nature changed, it changed in accordance with a certain pattern, law, or rhythm – the “*Logos*,” the logic of change. Aristotle in his concept of “formal cause” followed Heraclitus. For Aristotle every object had a “form” to how it changed. Also, according to Aristotle, there were general or abstract patterns of change in nature. If not interfered with, all acorns grow (change) into oak trees, human embryos develop into adult humans, and water runs downhill. The forms of change for Aristotle were teleological involving the actualization of potentials within things toward natural ends (“final causes”), but he did reject Plato's idea that order and form existed in a realm separate from physical nature. Further, Aristotle rejected the separation of order and change. For Plato, order applied to what was eternal, static, and unchanging. Aristotle believed that there could be orderly change and this “form” of things resided in nature. Modern science would take up this idea of laws of change and make it central to the scientific description and explanation of nature.⁶²

Within science, a law of nature is conceptualized as a regularity of change in nature. Although things constantly change and move about, things change in a predictable way. Modern science begins with the discovery of a variety of physical laws. For Galileo, when objects fall to earth they accelerate in velocity according to a general and universal formula. For Kepler, the planets moved in their orbits around the sun in accordance with three basic laws of planetary motion. According to Newton, the acceleration of an object upon impact is proportional to the ratio of force applied and the mass to be moved. For every action, there is an equal and opposite reaction. The Scientific Revolution found order within the changing world of nature and time.

What Newton kept from Plato was that this order in nature was imposed by an eternal reality, yet in the coming centuries science would move closer to the Aristotelian mindset, abandoning the notion of a separate realm of eternal order. The order in nature somehow directly derived from nature itself. This insight was critical in Darwin's formulation of his theory of evolution.

Because science adopted the concept of lawful change, all change in nature was presumably determined and predictable from natural laws. This is the

concept of **lawful determinism**. The specific flow of events is determined by general natural laws. Connected with the idea of lawful determinism was the concept of **mechanistic causation**. Each individual event in nature is an effect, totally determined by specific antecedent causes. Combining the two ideas, it is the laws of nature that determine what particular effect will follow from what particular cause. Given a particular cause, you can predict the effect. As it is frequently stated, cause-effect relationships in nature are lawful.

The mechanistic notion of causality adopted within science is often contrasted with the teleological view of change. The theory of mechanistic causation implies that the past determines the present; the teleological view of change implies that some future event or intended future purpose determines the flow of events in the present. As we saw in the previous chapter, religious and mythic views of the future were frequently teleological – the flow of events into the future was guided or controlled by the purposes or intentions of deities. Science challenged the teleological view of change, and consequently the teleological view of the future. There is no “intended” future that sets the course for present events.

Since from the perspective of lawful determinism all change in nature is determined by natural laws, there is no chance, free will, or unpredictability. We may not know all of the laws, but, if we did, we could predict, in principle, everything that would happen to the end of time.⁶³ The following famous quote from Pierre Simon de Laplace (1749 – 1827) sums up this view:

“We may regard the present state of the universe as the effect of its past and the cause of its future. An intellect which at any given moment knew all the forces that animate matter and the mutual positions of the beings that compose it, if this intellect were vast enough to submit that data to analysis, could condense into a single formula the movement of the greatest bodies of the universe and that of the lightest atom; for such an intellect nothing would be uncertain; and the future just like the past would be present before its eyes.”

This absolute determinism for all of nature espoused within early science conflicted with Christianity's belief that the individual souls had free will. Early scientists, such as Descartes, attempted to combine the determinism of science with the idea that humans possessed individual freedom. For Descartes, physical matter obeyed the lawful determinism revealed through natural science. On the other hand, Descartes believed that the human mind was non-physical and consequently free. Yet, for both many scientists and philosophers, Descartes's dualistic solution to the problem of free will in a deterministic world of nature had problems, for there is no clear way to understand how the mind – possessing free will and an immaterial existence – could influence a deterministic physical reality – the body.

In spite of the various important differences between early science and Western Christianity, described above, there were also notable connections and similarities. The belief that nature was lawful was based on the Christian belief that God had created a lawful and rational universe that obeyed a *Logos*

determined by God.⁶⁴ Early scientists believed that they were discovering the laws set down by God. Kepler believed that he saw a connection between the form and dynamics of the solar system and the Holy Trinity.⁶⁵ As indicated by the quote at the beginning of this section, Newton believed that the beauty and orderliness of nature must be due to a supreme being. The idea of progress, as it evolved in the Age of Enlightenment, had its beginnings and its inspiration in Western Christian thought, in particular in St. Augustine's vision of the universal linear progress of humankind.

Enlightenment and the Theory of Secular Progress

*"Thus we surpass all the times that have been before us;
and it is highly probable that those that will succeed, will far surpass us."*

John Edwards

"The negation of nature is the road to happiness."

John Locke

In this section I describe the growth of the theory of secular progress during the Age of Enlightenment. In particular I highlight the development of new social, political, and economic ideas during this period and connect these ideas to the emerging theory of secular progress. I also examine, continuing the discussion of the previous section, how the growing power of science increasingly challenged religious doctrine and authority and how this conflict played into the evolution of the theory of secular progress.

The historian Robert Nisbet asserts that progress is the most important idea ever developed in Western Civilization.⁶⁶ He identifies five basic premises behind the modern secular theory of progress: The value of the past, the superiority of the West, the worth of economic and technological growth, faith in reason and science, and the importance of life on earth. The philosophy of secular progress as it developed in the modern West assumed that progress is cumulative, building upon the accomplishments of the past; that the West should take a leadership position as the most modernized culture and society in the world; that economic and technological developments facilitate advances in all spheres of human reality, including morals, psychology, and social-political organization; that reason and science, over faith, revelation, and religious doctrine, are the preferred modes of inquiry and understanding to advance human society; and that worldly concerns are at least as important as other-worldly values.⁶⁷

Nisbet though does not believe that the idea of progress begins with the modern era. Nor does he believe that the idea of progress has a secular origin. Rather, as we saw in the previous chapter, the idea of progress arises in a religious and specifically Christian mindset, notably within the writings of St.

Augustine. (There were also clear indications of the idea in Greco-Roman thinking, such as in Lucretius, where the idea has a secular and naturalistic quality.) To recall, Christianity adopted a linear view of time, which it inherited from Judaism and ultimately Zoroastrianism. Further, early Christianity viewed linear time as progressive, leading to the Second Coming and the ascension of all deserving souls into heaven. The focus of this progressive view was more spiritual and otherworldly than secular, but even this is only a half-truth, for many Christians, including Augustine, believed that “Providence” was guiding humanity toward a better world in this natural reality as a prelude to a greater reward in the next.

In Nisbet’s most general definition of progress, he presents a broad and abstract formulation that captures both the secular and the spiritual elements of the idea. He states that progress throughout Western history has meant a movement from the inferior to the superior. He notes that this belief in a progressive direction to history meant two things: first that human knowledge grows or advances across time, and second, that humans are moving forward along various dimensions of improvement, including moral and spiritual development and overall happiness. The general belief in progress implied a movement toward human perfection. Earlier religious writers on the idea of progress highlighted spiritual criteria of advancement, whereas later modern writers highlighted more secular criteria of improvement, but the general idea of improvement from what was inferior to what is better captures what is basic to all the different versions of the idea across Western history. As Nisbet sums it up, “...the idea of progress holds that mankind has advanced in the past – from some aboriginal condition of primitiveness, barbarism, or even nullity – is now advancing, and will continue to advance through the foreseeable future.”

What happened in the period of 1600 to 1800 is that the Augustinian notion of progress became increasingly secularized and connected with science, rather than with *Scriptures* and Providence. Rather than the *Bible*, science became the means to progress. But this did not happen suddenly, and many writers combined religious ideas with scientific ideas in formulating their view of progress. Even early scientists such as Descartes, Kepler, and Newton did not immediately abandon religion in favor of science – they attempted to synthesize the two perspectives.

A notable example of early efforts to combine science and religion within a theory of progress is contained in the writings of Gottfried Wilhelm Leibniz (1646 – 1716). Leibniz was a philosophical and mathematical genius, unequaled in sheer intelligence and breadth of interests, co-inventor of calculus along with Isaac Newton, who influenced diverse areas of science and philosophy and anticipated the modern relativistic conception of space and time.⁶⁸ Leibniz proposed a theory of **universal progress**. He argued that following from the “**principle of plenitude**” (that everything that can be will be) the whole universe should show infinite progress as it moves into the future. In essence, following an Aristotelian line of thinking, progress was the actualization of the infinite potential of the universe. From within a Christian framework, Leibniz argued that the infinite progress of the universe is the realization of the perfection and beauty of

God – the Creator of the universe.⁶⁹ For example, he states, “...To realize in its completeness the universal beauty and perfection of the works of God, we must recognize a certain perpetual and very free progress of the whole universe, such that it is always going forward to greater perfection.”

Although the theory of progress developed by Leibniz invokes a supreme God and reflects his Christian philosophy, he does break free of the narrow vision of reality bequeathed from the Middle Ages. Leibniz was very aware of the advancing discoveries of science – of the potential vastness and intricacy of the universe beyond what was visible to the naked eye (he was particularly fascinated by the discoveries of Leeuwenhoek - and his expansive vision of the entire cosmos in a state of progressive development anticipates twentieth century evolutionary cosmology.

A notable example of an idea that combines science and religion in a theory of progress is **Puritan Millenarianism**. The Puritan Revolution of the seventeenth century greatly influenced many early scientists, including Isaac Newton, and the Puritans had a strong progressive philosophy of history. They believed that a divinely created universal law (Providence) was in operation in the history of humankind that eventually would lead to a Golden Age or “millennium.” They also thought that the pursuit of human knowledge, especially scientific knowledge, would accelerate the arrival of the millennium. They saw a strong connection between scientific progress and spiritual progress.⁷⁰

Yet the free spirit of critical inquiry that began in the seventeenth century would create increasing tension and difficulties between science and religion as we move into the eighteenth century. Descartes in fact had set the stage by doubting everything that could not be proven, and Bacon, in arguing that scientific truth depended on observation of facts, would likewise undermine the claims of religion. Both rationalism and empiricism as philosophies of knowledge evolved throughout the eighteenth century and as the implications of these two approaches to knowledge became clearer, secular philosophy increasingly became more at odds with religious belief.

The secular approach to the future not only derived its inspiration from science, but it also drew upon the whole history of rational and empirical philosophy stretching back to the ancient Greeks. As science took hold in modern Europe, secular and critical philosophy clearly emerged again as a pursuit separate from religion and theology. In Medieval Europe, Christian thinking dominated philosophy, for example within Christian Scholasticism, but the expression “rational enlightenment,” often used to describe the philosophy of the Enlightenment, refers to the emancipation of both science and philosophy from religion and theology. Although secular philosophy did not directly involve the scientific method of experimentation, academic philosophers of the Enlightenment would reinforce the belief that the future and, more generally, all reality could be understood and predicted through rational and empirical methods, rather than through metaphysics, prophecy, and mystical revelation.

The impact of secular philosophy on the modern concept of progress is especially significant in the emergence of social and political philosophy. Niccolò Machiavelli (1469 – 1527) was one of the most famous early modern writers to

apply secular thinking and philosophy to issues of politics and social order. In his well known book *The Prince* (1513) Machiavelli outlines rules and strategies for the maintenance of the political state which, in historical retrospect, have frequently been seen as ruthless, manipulative, and unethical in nature; Machiavelli is remembered for his expression “The ends justify the means.” But Machiavelli saw himself as a realist who was simply attempting to describe how to most effectively govern and run a political state. For Machiavelli, politics should be based on a realistic understanding of the nature of humans and their behavior. Further, politics should not be subordinated to religion but stand as an independent discipline with its own principles and laws. Machiavelli is often seen as the starting point of modern political philosophy.⁷¹

A second major philosopher who did much to determine the future course of political philosophy was Thomas Hobbes (1588 – 1679) who is best known for his major philosophical work *Leviathan* (1651). Hobbes not only saw political philosophy and politics as independent of religion, he, in fact, believed that a strong secular government and political order was needed to counter-act the negative effects of religion. Civil law took precedence over religious doctrine. Hobbes was highly critical of the religious conflicts, atrocities, and fanaticism of his day, and he believed that a strong central government was needed to bring order to his turbulent world. Although Hobbes was critical of the destructive aspects of religion, his call for a strong central government to maintain order in the world was ultimately based on a rather pessimistic view of basic human nature. According to Hobbes, humans are inherently selfish and hedonistic and prone to war as a means to secure what they want at the expense of others. War is natural to humans, and ethics is reduced to human desire: What is good is simply what we desire or want, and what is evil is what we hate or avoid. Hence without a strong government to control the selfishness and violence in humans, all would be conflict and chaos, and in the final analysis many or most of us would not get what we want. A strong authoritarian central control protects us against each other.⁷²

What is especially noteworthy in both Machiavelli and Hobbes, aside from their philosophical emancipation from religion, is their argument for strong centralized government and control. Both are often seen as having rather negative views of human nature, and their political philosophy, to a great degree, follows from their ideas on human psychology. In the evolution of social and political thinking on the nature of secular progress, two different central themes emerged: Progress was associated with both increasing social order and increasing freedom and individuality. These ideals (compared to Bloom’s conformity versus diversity) not only seem contradictory, but would recurrently lead to war and conflict among nations in the centuries ahead.

On the other side of the philosophical continuum, the great British philosopher John Locke (1632 – 1704), one of the great inspirational starting points for the Enlightenment, emphasized individual human rights, freedom, and self-governance, and the right of the general population to determine the legitimacy of those who rule them. A key theme that emerged during the Enlightenment was a questioning of all kinds of authority, religious or secular.

According to Locke, there are no “divine rights” that only the privileged few possess; rather, all men are equal and no one is above the law. People have the right to challenge the authority of their government when its leaders fail, through their actions, to serve the public good. Locke also strongly argued for toleration among diverse peoples and defended freedom of religion. He is well known for his defense of the natural rights for life, liberty, and property. Contrary to Hobbes, Locke believed more in the inherent goodness and rationality of people; rather than war, he argued that humans, by nature, use reason to solve or resolve problems and challenges. Because of this more optimistic view of humans, Locke argued for limited power in government claiming that people have the natural capacity and moral character to determine their own lives. Hence, whereas the Christian church of the Middle Ages, following Augustine’s view of the inherent evil nature of humans, emphasized strong central control, Locke is the first of the great liberal thinkers who took the opposite view that individuals have the right to control their own destiny.⁷³

As Watson argues, the writers of the Enlightenment had a strong interest in understanding human nature and their views on progress and how to improve human society were based upon their ideas about human psychology and the human mind. Locke was highly influential in his development of a comprehensive theory and description of the human mind in his book *An Essay Concerning Human Understanding* (1689), considered the modern starting point for empiricist psychology and philosophy. It is noteworthy that Locke’s *Essay* and many subsequent works delving into psychology, the mind, and human nature attempted to provide a scientifically informed picture of humanity independent of religion. Secular theories of political and social order were intimately connected with secular and scientific theories of human nature. According to Watson, pessimistic psychologies, such as in Hobbes and Machiavelli, provided the seeds of later conservative and authoritarian political philosophies, whereas more positive psychologies, such as in Locke, provided the foundation for the development of political liberalism.⁷⁴

A second great philosopher and contemporary of Locke, and one who championed the importance of freedom in his political writings, was Baruch Spinoza (1632 – 1677). Along with Locke, he is also considered one of the major inspirational sources of the Enlightenment. Whereas Locke was an empiricist, Spinoza was a rationalist; in fact, in ways he was the supreme rationalist of modern times, believing that all of existence, including human nature and God, could be deduced and comprehended through reason. In totally rejecting the authority of traditional religion (including both Judaism and Christianity), Spinoza eschewed miracles, the supernatural, and the afterlife and argued in his great philosophical work, *The Ethics* (1677), that God and the universe were ultimately the same thing; Spinoza was a monist and a pantheist. Spinoza embraced the ideals of science and believed that all of nature could be understood; he modeled his *Ethics* on the principles of mathematical proof and deduction, and within *The Ethics* created both a comprehensive psychology and moral theory based on reason and a naturalistic perspective. Whereas philosophers and scientists alike, up to Spinoza’s time, may have criticized certain features of traditional religious

doctrine or religious practices, Spinoza attempts to completely break free of religious authority, substituting reason and science as the final arbiters of truth. For Spinoza, the search for knowledge must be a totally democratic process with no special interest group determining what is deemed acceptable.

According to Watson, Spinoza created the modern world. He integrated theology (a rationalist version), science, psychology, ethics, and politics into a coherent whole. In his *Tractatus Theologico-Politicus* (1670) he outlined his political views. According to Spinoza, and contrary to Hobbes, not only do humans possess a fundamental need to help each other but it is the function of government to help people to realize their potentials, in particular, their capacity for reason. Governments can not control people through fear. As with his views on religion and the quest for knowledge, Spinoza attacked tyranny and repression. For Spinoza, as was the case with Locke, freedom is a critical value in human society.⁷⁵

Spinoza has been identified as the founder of modern Biblical criticism.⁷⁶ As we move into the eighteenth century, we find increasing skepticism towards the validity and morality of Christian doctrine and practices. As we have seen, secular writers in the sixteenth and seventeenth centuries attempted to emancipate both political philosophy and ethical theory from religion, increasingly turning toward science as a foundation for creating normative ideals and direction for humanity.

The philosopher and essayist who brought this secular re-orientation to its apex and culmination, and who is often identified as the father of the Enlightenment, was Voltaire (1694 – 1778). A great admirer of Newton, Voltaire argued that human society needs to be reconstructed based on science, reason, and observation. He attacked all forms of absolute authority and dogma, religious and secular, and defended various civil liberties including freedom of religion. He did not believe that God determined human destiny and came to totally reject religion as a structure that could provide beneficial guidance in life. A cynic, skeptic, and satirist who critiqued Leibniz's optimistic vision of the world and universal progress in his well known satire *Candide* (1759), Voltaire penned the famous line "If God did not exist, it would be necessary to invent him."⁷⁷

Central to science and the new secular philosophy of the Enlightenment was a new theory of the nature and acquisition of knowledge. As we have seen, Descartes and Bacon, early on, articulated the principles of rationalism and empiricism as fundamental to the new theory of knowledge. Two philosophers of the Enlightenment are especially important in understanding the new epistemology, or theory of knowledge, as it further evolved in the eighteenth century. They are the Scottish philosopher David Hume (1711 – 1776) and the German philosopher Immanuel Kant (1724 – 1804). Hume carried the philosophy of empiricism to its logical and most dramatic conclusions, whereas Kant attempted to synthesize rationalism and empiricism into a consistent and coherent philosophical framework. Hume's two most noteworthy philosophical works are *A Treatise of Human Nature* (1739) and *An Inquiry Concerning Human Understanding* (1748). Kant's most famous philosophical work is the *Critique of Pure Reason* (1781). Hume is generally considered the greatest empiricist

philosopher – in fact, even “the greatest philosopher to write in English,” whereas Kant is regarded as the greatest German philosopher of all time. According to Kant, it was Hume who “woke him from his dogmatic slumber” and stimulated him to write the *Critique of Pure Reason* in response to the highly skeptical ideas and conclusions espoused by Hume.⁷⁸

Let us begin with Hume. His basic philosophical starting point was that knowledge either derived from perceptual sense impressions or reason. If a statement or belief could not be supported through either sensory observation or reason, then the belief, according to Hume, did not constitute real knowledge. From this starting point, Hume demonstrated that beliefs such as the existence of an external world, cause – effect relationships, the existence of a self (Descartes’ presumed indubitable starting point), and the existence of God or anything metaphysical, could not be definitively supported or proven either through reason or sense experience. These beliefs were simply habitual beliefs or thoughts and did not constitute real knowledge. It is clear that Hume’s conclusions undercut any rational or empirical attempts to prove the existence of God, but they also undercut the idea that even science could prove anything. The postulation of “scientific laws” based on generalizations of facts cannot be proven for we can never be sure that the “law” will hold through subsequent observations. Although Hume’s reasoning provided a basis for rejecting religious beliefs on the grounds that they could not be proven either rationally or empirically – which philosophers of the Enlightenment would embrace – Hume’s ideas also revealed a real philosophical weakness in the presumed certainties of science. For Hume, beliefs about laws of nature are contingent. As we will see, Hume’s skeptical critique of science would eventually have an impact on the evolution of the philosophy of the Enlightenment. Yet, in the enthusiasm of the first century of the Enlightenment, Hume’s skepticism regarding science did not significantly undermine the secular agenda of the time.

Kant, on the other hand, aware of the skeptical conclusions of Hume, attempted to demonstrate that science did have a solid epistemological basis. Kant’s response to Hume was to argue that there was a set of necessary “categories of human understanding” that science assumes in its investigation and conceptualization of nature (what Kant called “synthetic a priori” knowledge). These categories of understanding cannot be questioned since all human thinking, as well as all human experience, assumes these categories as its starting point. The categories of human understanding only apply to the world of sense experience, and if we attempt to apply them to what exists beyond sense experience (for example God), they generate antinomies or contradictions. Hence, there is no rational or empirical way to demonstrate the existence of God, because God lies beyond the realm of meaningful and intelligible human experience. Instead, for Kant, God belongs to the realm of faith. By setting boundaries to the limits of science, Kant made room for the importance of faith.

Kant’s conclusion that science contains certain empirical knowledge because it assumes unquestionable categories or concepts in its formulation has not stood the test of time. The fundamental concepts of science have changed since the time of Kant. It does not appear that the human mind is somehow

welded to a set of unchangeable categories of thought. Yet Kant's conclusion that science or any form of human understanding presupposes some set of concepts in making sense of the world has become a highly influential idea in modern intellectual history. The problem is that this conclusion opens the door to **subjectivism** - all humans understand reality through conceptual categories that filter and organize experience, hence objective knowledge is impossible. All human knowledge is from a conceptual point of view.

The skeptical conclusions and implications connected with the philosophies of Hume and Kant had their most immediate impact on the legitimacy of religious, mythological, and metaphysical belief systems. Although many illustrious philosophers, theologians, and religious figures throughout history had attempted to prove the existence of God and embraced all kinds of metaphysical beliefs, such as the existence of angels, demons, heaven, hell, and higher spiritual realms, Hume and Kant philosophically demolished the rational credibility of these beliefs and arguments. Consequently, the way was opened for a total rejection of religious and metaphysical ideas in formulating a vision of reality and the future.

Science and secular philosophy broke free of religion and religious notions of progress in the eighteenth century. The great French economist Jacques Turgot (1727 – 1781) provided the first clear expression of a purely secular concept of progress. Turgot identified the ultimate objectives or ideals of progress as knowledge, freedom, and economic growth.⁷⁹ Emphasizing these three central goals of progress is noteworthy because they are all secular in nature. Turgot does not include anything spiritual on his list of the fundamental objectives of progress.

We have already seen that knowledge - in particular scientific knowledge - was strongly connected with the idea of progress in Bacon and Descartes, among others. Even the Puritans connected the advancement of knowledge and science with progress. Yet early science exclusively dealt with the physical world rather than the spiritual realm, hence the advancement of scientific knowledge could be described in entirely secular and non-spiritual terms.

The importance of freedom as a second central ideal reflects the spirit of individualism in modern Europe in the eighteenth century and is indicative of the growing opposition to authority, political or religious. We have already noted how freedom was a key political and social ideal in the philosophies of Locke, Spinoza, and Voltaire and how the rise of individualism in the West actually goes back to the High Middle Ages and the Renaissance. By the end of the eighteenth century freedom and liberty would become the battle cries of the American and French Revolutions, and individualism, freedom, and democracy would go on to become central ideals or values of modernism. But individualism and freedom are fundamentally secular ideals, and in fact, as we have seen, have often been at odds with the authority of organized religion.

The third ideal - economic growth - is decidedly materialistic. To suggest material advance as a fundamental criterion of progress is clearly aligned with the materialist mindset of science rather than with the spiritual mindset of religion – it is secular rather than otherworldly. Just as freedom was a central theme in

many theories of secular progress, economic and materialist advance was another key goal identified in secular theories of progress.

Turgot would have a significant influence on the father of modern economic theory, Adam Smith. Smith drew a strong connection between freedom and economic growth in his theory of progress. Smith identified freedom as the means to economic advancement, just as Bacon and others had identified scientific knowledge as a means to the material improvement of the human condition.

It is noteworthy that Turgot also formulated a general historical theory of progressive change that was fundamentally secular in nature, and connected his vision of the future with his theory of the past. He argued that historical progress was cyclical, involving alternating periods of barbarism (chaos) and rationality (order) – progress was not a steady linear flow upward. Each cycle of chaos and order brought humanity further along to a higher stage of social and economic development. In addition, each cycle moved humanity more toward individual freedom and away from centralized, authoritarian control. In general, for Turgot, history advanced in stages (an idea we saw in Augustine), and he combines in his theory of change, both progressive and cyclical views of time.

Hence, although reason and science, as well as cumulative growth, were emphasized in many early visions of secular progress, theories of historical change during this period did not always see progress as smooth, steady, or even peaceful. Turgot presents a view of oscillating order and chaos, reminiscent of Babylonian mythology and the philosophy of Empedocles. His view is also suggestive of the Zoroastrian – Christian idea of the war of good and evil, except now good and evil are interpreted in secular terms. In the previous century, the great Italian philosopher and historian Giambattista Vico (1668 – 1744) formulated a grand cyclic theory of progress that described alternating periods of growth and decay, of order and chaos in human history. For Vico, the ongoing conflict was between the primitive impulses of individuals and the progressive realization of a harmonious and civilized social order among humans. Although Vico mixes Biblical and secular-naturalistic ideas in his history, he does see an overall progressive evolution of humanity, civilization, and even religious doctrine and practices.⁸⁰ Another example of cyclical order and chaos was presented by The French bishop and scholar Jacques-Bénigne Boussuet (1627 – 1704) who, in his *Universal History* (1681), described history in terms of the rise and fall of empires. As Nisbet points out, the ideas of cyclic change, stages of development, violence and conflict, and both cumulative and revolutionary change were often important and central concepts in theories of progress during the seventeenth and eighteenth centuries.⁸¹ As we will see, all these ideas and themes would continue to influence the evolution of the philosophy of secular progress in coming centuries.

Another point to highlight regarding these early theories of progress during the Enlightenment is that coincident with their development, historiography was also taking on a decidedly secular flavor as well. Generally, the study of history had been dominated by Christian visions of the past, but in the eighteenth century, as philosophy and theories of progress became more secular, scientific,

and naturalistic, history also broke free of religious influence. This is important because secular theories of progress and the future, such as in Turgot and Voltaire, grounded their ideals and visions in theories and interpretations of the saga of the past. Secular theories of progress required secular theories of the past. Not only did secular views of history break free of religion, but in the case of Edward Gibbon's (1737 – 1794) highly influential *The History of the Decline and Fall of the Roman Empire* (1776, 1788), religion, and in particular Christianity, is seen as interfering with human progress.⁸²

If Turgot and others separated progress from the spiritual and religious, Marques de Condorcet (1743 – 1794), in his classic philosophical statement of the Enlightenment *Sketch for a Historical Picture of the Progress of the Human Mind* (1795), clearly set science and progress in opposition to religion.⁸³ Wendell Bell refers to Condorcet as “the first futurist.” Condorcet was a highly influential figure in the evolution and articulation of the idea of secular progress. Echoing the individualist theme we have been following throughout European history since the High Middle Ages, Condorcet declared himself to be the adversary of all forms of tyranny, which in his mind included royalty, nobility, political monarchies, and the priesthood. Religion, he believed, was based on superstition and an ignorance of nature and thus was the enemy of progress which, for Condorcet, meant increasing freedom. Similar to Bacon, he envisioned the ideal society of the future as one ruled by science and reason⁸⁴ and it was only through science and reason that humanity could be liberated from the closed-minded tyranny of religion. Progress having first emerged as an influential idea within Western Christianity, had now not only emancipated itself from religion, but literally turned against religion in the writings of Condorcet.

Condorcet saw no limit to the perfectibility of humanity. Developing a secular theory of history to support his secular theory of the future, Condorcet argued that there had been ten stages thus far in human history, with the French Revolution ushering in the beginning of the newest and potentially most “glorious” period in human advancement.⁸⁵ Condorcet's concept of progress, though highlighting the importance of science, reason, and liberty, was broad in scope. He hoped and expected that there would be improvements in the future in the arts, morality, human intelligence, physical health and abilities, and of course science. It is noteworthy that he includes morality in this list for morality in the past had been strongly associated with religion. Yet, given the continued criticisms that had been raised against the church regarding its own moral behavior, it is understandable that Condorcet would see religion not as the foundation of morality but perhaps the reverse. Religion had led to immorality, including war, persecution, corruption, greed, and the suppression of the rights of human beings. Hence, it is important to see that religion and myth, though once having provided a basis and justification for morals as well as for social justice, were now rejected as legitimate and valid foundations for morality. The secular approach and, in particular, the use of reason, according to Condorcet, would provide a new and better basis for providing moral direction in the future.

If what was good, that is Christian religion, had now become bad, the reverse that what was bad had now become good, perhaps had also occurred.

This is the argument of Dinesh D'Souza in his book *The Virtue of Prosperity*.⁸⁶ According to D'Souza, a new set of fundamental human values emerged during the Enlightenment. He notes that during the period of the fourteenth through the seventeenth centuries, Europe was ravaged by war and chaos in the name of religion and that the people of Europe suffered from both a scarcity of food and resources, as well as disease. In the minds of the architects of the Enlightenment, D'Souza states, the idea began to emerge that there must be a better way to live than under the dominion and influence of religion. The quest for virtue and the perpetual wars of good versus evil had produced violence and immense human suffering. Hence, the thinkers of the Enlightenment, believing it was time for a change, substituted material and commercial gain and self-interest for religious virtue as the central goals of society. (We should note that this change was beginning as early as the Italian Renaissance.) This was a significant shift, both ideologically and socially. Not only during the Middle Ages, but as far back as the ancient Greeks, economic trade and technological development had been seen as inferior to the pursuit of virtue. But we have seen that throughout the Middle Ages, and accelerating with the rise of modernism, commerce and technological innovation became increasingly powerful and central as guiding forces in human society. D'Souza states that as early as the sixteenth century, Machiavelli had abandoned the goal of virtue in political and social affairs, replacing it with self-interest and personal power. The classic case, which we will come to momentarily, is Adam Smith, who founded his whole economic theory on the free pursuit of self-interest. Following D'Souza's interpretation, the founders of the United States took the ideas of Smith, as well as Bacon and Locke, and created the first true secular society based on "**enlightened self-interest**," establishing a clear separation of the power of religion from the operations of the state. Therefore, what had once been considered vices from a Christian and spiritual standpoint – namely self-interest and material wealth – had been turned into the central values of a modern society.

The themes of freedom, self-interest and self-determination, economic and material advance, and power over nature through the application of science, expressed in the writings of the philosophers of the Enlightenment, are intimately connected with social, political, technological, and commercial changes that were occurring in Western Europe during this period. Western Europe had become the new commercial hub of global exchange. Industrial production in Europe was steadily rising and would eventually surpass China and Asia in the early nineteenth century. With the development of the modern steam engine by James Watt in the 1760's, industrial energy production skyrocketed. Agricultural production also dramatically improved in the eighteenth century. Factories, with highly organized and efficient systems of manufacturing, sprouted and grew throughout Western Europe.⁸⁷ It appeared to many observers of the time that humanity was gaining control over nature through science, technology, and industry. The competitive and individualist philosophy and practice of capitalism increasingly drove economic and commercial development. Mass education and literacy increased which undermined the authority of political tyrannies and

religion. Educated people in Western Europe learned about science and its principles of empirical and rational inquiry. There were political revolutions and changes as well, in the name of liberty, human equality, and democracy. Overall, not only were there significant changes in beliefs and philosophy, there were significant and resonant changes in ways of life as well.⁸⁸

In his writings, Adam Smith (1723 – 1790) captured and crystallized many of these social-economic trends. He articulated the central economic theory that would explain and justify the growth of the modern secular society, and he tied this economic theory to the concept of progress. In his highly influential book *The Wealth of Nations* (1776) Smith argued that if individuals were allowed to freely pursue their own self-interest through the creation of products and services that they could sell for profit and monetary gain, the overall effect would benefit the public good. In his mind, competition among producers for the sale of their products to the public would cause steady improvement in the products, as well as control the prices of such products. This epoch-making formulation of the philosophy of **capitalism** was founded upon a clear connection in Smith's mind between freedom, material gain, and the idea of progress.

Smith believed that there was a natural progressive movement, revealed within history, toward the advancement of society and the growth of wealth. This "law of progress" was not interpreted within a religious framework, but rather within a secular and naturalistic framework. He described this general process as the "natural progress of opulence" which leads to increasing happiness for everyone. Smith believed that if individuals were given the "natural liberty," which for him meant "economic freedom", to pursue their own goals and self-interests they would benefit, – through the "invisible hand" of free competition, – the overall public good of society. For Smith, increasing human freedom facilitated the natural social and economic progress within history.⁸⁹

For Smith, as well as many other advocates of secular progress, economic, industrial, and technological development would produce social, political, and moral advance. Hence, both individual and social virtue would be served. Secular progress would cure all social ills, such as crime, disease, poverty, and mental disorders. Progress was the royal road to human happiness.

Not only did the philosophy of capitalism provide an economic and materialist justification for secular modernism, it also provided a clear alternative to the idea of divine Providence as the cause of progress in human history. From Smith's perspective, the operation of capitalism, which would involve competition among producers, leads to progress without some divine hand guiding the process. As the idea of secular progress evolved in the eighteenth and nineteenth centuries, various philosophers, social theorists, and scientists, began to formulate naturalistic explanations for the mechanism of progress. Instead of turning to the teleological explanations of progress provided by such religious thinkers as St. Augustine, they developed scientific explanations and used these secular ideas to support their social and political philosophies of how to direct and guide the future. Progress not only had secular goals, but secular causes.

Although Smith is known for emphasizing economic self-interest and economic competition in his theory of progress, he saw his philosophy as having

a moral focus. In place of the tyranny of business monopolies controlling the economy, he argued that the general population, through consumer judgment and demand, should control economic development – economic growth should be founded on a democratic process. Further, Smith’s ideas reflected the emerging popular view that the modern commercial society was a new stage in human progress – a positive advance over previous human societies. Wealth was not inherently evil, but was built on productivity and exchange, that is, hard work and labor, and mutually beneficial reciprocities. Finally, Smith believed that social justice was critical to modern society, and supported some degree of government intervention to insure that the benefits of economic growth were distributed throughout society. As both Watson and Nisbet argue, Smith never separated economics from social and ethical concerns and values.⁹⁰

As D’Souza argues, the ideas of Smith, as well as those of Locke and Bacon, were critical in the creation of the United States of America. D’Souza contends that the United States was the first true secular society. Watson, in a similar vein, sees the “invention of America” as the concrete realization of the principles of the Enlightenment. Although colonial America had a much more pragmatic bent than Europe, the leaders of the American Revolution supported and adopted many of the main philosophical principles of the Enlightenment. Thomas Paine (1737 – 1809), in his famous book *Common Sense* (1776), which did much to ignite the American Revolution, strongly argued for the right to rebellion in order to realize freedom and independence from English domination. Paine believed in the ideals of progress and human improvement, strongly defended human rights (he opposed human slavery), argued for such contemporary ideas as free public education and minimum wages, and is generally considered one of the modern founders of political liberalism. He attacked all forms of organized religion and rejected monarchical government. A Deist, he wrote that “My own mind is my own church.” Benjamin Franklin (1706 – 1790) and Thomas Jefferson (1743 – 1826), two of the central architects of the American Constitution and Declaration of Independence, worked into these pivotal documents as central values the principles of freedom, equality, and prosperity. Both Franklin and Jefferson were very interested and active in science and critical of traditional religion (though Franklin did have some mixed thoughts on this point). Jefferson is particularly noted for his strong support of separation of church and state, though he believed, as had Locke before him, that fundamental and unalienable human rights were derived from God. As Watson recounts, Jefferson was a great defender of the United States and was very optimistic about his country’s future. According to Watson, America surpassed Europe in political development for, in spite of the European Enlightenment proclaiming the values of human freedom and individualism, eighteenth-century Europe was controlled by authoritarian monarchies. In America, there were no established dominance hierarchies to overcome, and thus democracy grew and flourished with greater ease. Unprecedented new freedoms emerged in the United States, especially as declared in the Bill of Rights, which would be a major inspirational source for the French in the creation of their Declaration of the Rights of Man. All in all, the American people, united in

a spirit of common destiny, had a powerful sense of a promising and better future. The United States was the great experiment of the Enlightenment and the philosophy of secular progress.⁹¹

In coming to the end of my review of the eighteenth century, it seems clear that the philosophy of secular progress, at least in the minds of many of its advocates, had severed any remaining ties with religious thinking. Although there were still some nineteenth century philosophers and social theorists such as Hegel, Herder, and Lessing in Germany, who showed a strong Christian influence in their visions of progress, a relatively autonomous and comprehensive secular philosophy of human life, progress, and the future had emerged in human thinking in modern Western Europe by the year 1800.

In summary, in numerous ways secular modernism challenged the authority of the religious view of life. One main difference between the secular view of the future and earlier religious views was that secular modernism saw the future as something that could be understood and controlled through reason, science, modern economic practices, and industry. As noted earlier, religious and mythological views often saw the future as something revealed and often under the control of supernatural or spiritual powers.⁹² Secular modernism empowered humanity, conveying the message that, rather than follow the dictates of authority or tradition, individuals should pursue freedom; at last people were the architects of their own destiny.

Concerning the issue of truth, science and the philosophy of the Enlightenment challenged the validity of religious, mystical, mythological, and magical approaches and beliefs. The foregone conclusions and certainties of religious revelations and prophecies regarding the future were questioned, rejected and replaced by scientific laws and principles and rational and empirical methods.

The biologist Kenneth Miller states that the conflict between science and religion as it emerged in modern times was framed in extremist and absolutist terms. According to Miller, science presented itself as offering a complete explanation of reality – in materialist terms – thus excluding any need for divine or spiritual forces. The question of whether science can provide a complete explanation of the universe is still being debated today, but as Miller quite readily admits, every time some critic of science states that science will never be able to explain some feature or dimension of reality, history invariably proves the critic wrong. The growth of science over the last few centuries has been a steady and tenacious drive to turn the inexplicable into the explicable.⁹³ Further, as Galileo first realized and suffered for in the end, scientific ideas frequently contradict the views espoused in religious explanations of reality. Whether science, in the final analysis, will be able to explain everything is a question yet to be answered, but clearly religious explanations have suffered repeated defeats and contradictions at the hands of science. This historical pattern of contradiction and retreat began with the Scientific Revolution and continued into the Enlightenment.

Another major point where secular modernism challenged religion was on the issue of values. Values identify the ideal or preferred direction for the future. Secular and scientific thinking brought with it the view that values and ideals

could be arrived at through reason and human dialogue, rather than through divine authority and revelation. If we trace the history of ideal visions of the future in the modern West, there is a definite shift in focus from religious justifications of ethics and morality to rational, materialist, and democratic justifications.⁹⁴ Humanity no longer followed a script or set of values created by the gods; rather humanity through reason, science, debate, and discussion became the creators of the script and the ideals for the future. This is the view espoused by Voltaire and Condorcet, among others. We have also seen that in the minds of economic theorists such as Adam Smith, free enterprise and economic development would create a happier, more ethically advanced world than would a social system of religious authoritarian control.

The concept of secular progress entailed defining growth or improvement in the human condition in terms of values derived from empirical or rational criteria, rather than religious or spiritual sources. Secular ideals of progress included material wealth and improved living conditions, the control of nature, the advancement of scientific knowledge, the evolution of technology, economic freedom, democratic rights and participation in government, and greater opportunities for education. Many of these values became central ideals in the creation and development of American politics and social philosophy and the American way of life (though it should be noted that at least for some of the founding fathers some of these values were justified in terms of beliefs about God).

As one final important shift, science and secular modernism provided a new story for humanity, overturning that found in the Bible. Stories by definition have temporal extent; they relate a series of events that occur over time. Stories will also usually have a direction in the form of a plot and a climatic resolution. Western religion provided both an explanation and narrative of the origin and development of humanity and the world and a set of visions and predictions of the future grounded in its historical narrative – it connected past and future usually in the form of mythic drama. Science, beginning in the eighteenth century, began to piece together a new story of our creation and the evolution of the world. (More will be said on this in subsequent sections.) Secular histories began to appear. This new set of stories had a different plot and identified natural forces, rather than supernatural or spiritual ones, in explaining human history. Enlightenment philosophy, inspired by the promises of science and technology, presented a new secular vision of the possibilities of tomorrow built upon these secular histories. Further, Enlightenment philosophy identified a set of secular values that gave history a progressive direction. Aside from Turgot and Condorcet, Bernard de Fontenelle (1657 – 1757), in his *A Digression on the Ancients and Moderns* (1688), identified the cumulative growth of knowledge as a fundamental trend within human history; Voltaire wrote a general history, *Essay on Customs* (1756), which highlighted the improvement and “enlightenment” of the human mind; and William Godwin (1756 – 1836), husband of Mary Wollstonecraft and father of Mary Shelley, in his *Enquiry Concerning Political Justice and its Influence on Morals and Happiness* (1793) strongly argued that

individuality and the growth of freedom was the key dimension of historical progress and predicted its inevitable further advance into the future.⁹⁵

Central to the new story of humanity was the idea of natural progress. As we have seen Smith believed that progress in human history occurred through natural forces without the need for divine guidance or intervention. The idea that there was a **natural law of progress** was pursued and investigated into the nineteenth century, notably in the writings of social thinkers like Auguste Comte (1798 – 1857) and Herbert Spencer (1820 – 1903). Both believed that there was an inherent tendency in nature towards progress.⁹⁶ For both Spencer and Comte the law of progress was inseparable from the linear flow of time, yet whereas Spencer saw natural progress moving toward increasing freedom and individuation, Comte saw something very different.

Herbert Spencer argued for a philosophy of extreme liberal individualism. Instead of any type of authoritarian or centralized control on the behavior of individuals, Spencer believed that social order should arise through voluntary cooperation rather than government coercion. Spencer was the supreme advocate of the Enlightenment philosophy of freedom and individualism. Spencer connected his social philosophy to a general cosmological principle, which he referred to as the universal “developmental hypothesis.” In some important ways anticipating Darwin and contemporary evolutionary theory, (Spencer coined the expression “survival of the fittest”), Spencer argued that the universe as a whole moves from the homogeneous to the heterogeneous – from lack of form to increasing differentiation. At the human level, he saw a general trend from the static, authoritarian, and monolithic to the diverse, pluralistic, and individualistic. In the spirit of Heraclitus, everything for Spencer was process and motion. Unequivocally supporting the idea of progress, Spencer argued that both natural and social change were directional and developmental. There is a “beneficent necessity” that inexorably moves the cosmos, humankind included, toward greater individuality, freedom, and diversity. If chaos is identified with lack of structure and form, then for Spencer the “developmental hypothesis” implies that the general direction of time is increasing order arising out of chaos – but order in the sense of structure and differentiation rather than conformity and uniformity. Progress is also moral, for according to Spencer, evil is due to some type of deficiency in humans or nature, and as the universe evolves, all evil will disappear – what Spencer refers to as the “evanescence of evil.”

Auguste Comte, though emphasizing the growth of order in his theory of progress, has a diametrically opposed interpretation of progress and the nature of order. Comte is remembered for creating the discipline of “sociology”, a term that he coined. As Newton had developed a scientific explanation of the physical world that empowered humanity, through technology and industry, to manipulate and control physical matter, it should be possible, according to Comte, to develop a “**social physics**” that would describe the laws of human society and empower humanity to shape and direct the social world. In essence, Comte was applying the logic of science to human society and following through on the argument of the Enlightenment that science could be used to improve the human condition. As Watson notes, Comte, among other pioneering social scientists in the

nineteenth century, wanted to explain the growth of modern society (a scientific explanation of social history) and apply this knowledge to politics; it was not enough to describe and explain progress – this knowledge must be used to create a better world.⁹⁷ Interestingly, Comte believed that nineteenth century Europe was in a state of “spiritual anarchy” with the church having lost its control and authority – an apparent confirmation of the victory of secularism over theism but with negative consequences. Further, Comte believed that individualism had become the “disease” of the West – another confirmation of the success of the Enlightenment, but again interpreted as a negative result. Whereas the architects of the Enlightenment, such as Condorcet and Smith, had strongly connected progress with freedom and individualism, Comte took the opposite stance and connected progress with increasing order – an order of regularity, connection, and organization. (For Newton, order in nature meant regularity and uniformity.) In Comte’s mind what Europe needed was more stability and order, not more freedom and individuality. In Comte’s mind the natural law of progress produced increasing organization in the world rather than anarchistic individualism.

The contemporary futurist Virginia Postrel defines a “technocracy” as a rationally controlled and managed society, based on the idea that the behavior of humans and social organizations can be scientifically predicted, and hence directed toward some focused set of goals in the future.⁹⁸ This clearly appears to be Comte’s ideal and vision of progress. According to Nisbet, there were numerous other nineteenth century social thinkers, such as Rousseau and Saint-Simon, who believed that under the banner and justification of progress, human society should be controlled, directed, and organized.⁹⁹ Claude Saint-Simon (1760 – 1825) argued in a manner resonant with the philosophy of Francis Bacon that human society should be organized along scientific principles. A great believer in future progress, Saint-Simon contended that “The golden age is not behind us, but in front of us. It is the perfection of social order.”¹⁰⁰ For all these writers, progress was connected with increasing social order, in the sense of organized coordination and uniformity, and this progressive order needed to be imposed on human society - a seemingly opposite message to the original ideal of freedom in the Enlightenment.

As I introduced earlier, the philosophy of the Enlightenment actually bequeathed to posterity two apparently contradictory ideas regarding the nature of secular progress. On one hand, freedom and individualism were central values of the Enlightenment – a consequence of the centuries old battle against the perceived repressive authority of both the church and royalty. Yet the Enlightenment also embraced science as the road to truth and early science described nature as a deterministic and orderly reality, subject to laws that governed its behavior. (Note the parallel between Western religion and Western science – in the former case God ruled the heavens and the earth, in the latter case, natural laws ruled the universe.) If science is applied to the world of humanity, the implication is that there are discoverable laws that describe human behavior and that an understanding of these laws would empower humans to control human affairs just as humans had learned to control the processes of nature. Although it might seem paradoxical, Condorcet, the great defender of

individualism and freedom, believed that the future of human society was scientifically predictable.

Further, the Enlightenment embraced reason as the appropriate method for discovering the truth, but rationality, as for example practiced in mathematics and logic, yields singular truths rather than many different truths or perspectives. The points of views of different individuals ultimately are insignificant – what matters are the singular and unequivocal truths revealed through reason and science. Hence, in this sense, reason and science are tyrants – there is only one correct view of reality. As Christian points out, one of the central goals of science has been to discover abstract truths that are universal and independent of cultural or individual bias and point of view.¹⁰¹

This unity of opposites – of universal order and individual freedom – clearly shows itself in the growth of modern nations in the eighteenth and nineteenth centuries. Although the tyranny of despotic royalty and religious authority was presumably challenged and overthrown in the democratic and scientific revolutions connected with the Enlightenment, the long term result has been that modernized governments regulate and control individual human behavior much more so than in the past. Citizens of modern society are monitored, policed, subjected to legal rules and regulations, and obligated to participate in many government controlled practices such as mandatory taxes and education. Many of these new forms of surveillance and control have been implemented, presumably to protect the rights of citizens and ensure for the public welfare, but the overall effect has been heightened national power and regulation over citizens. People of the Middle Ages were neither watched nor controlled any where near as much as in modern times. Yet, modern nations also support, to various degrees, a host of individual human rights, individual participation and democratic input in government, freedom of religion, and freedom to pursue personal and economic goals.¹⁰² Although there are clearly cases in modern times where excessive government control has negated human freedom, such as in Nazi Germany and the Soviet Union, the overall trajectory of modern history seems to have been a co-evolution of both government regulation and individual freedom and rights.

Immanuel Kant, who believed in historical and moral progress, did not see a paradox in the evolution of human freedom and the growth of government and social order. Kant viewed individual human beings as autonomous, rational, and free, and he saw progress as the advancement of freedom and reason. He did see, however, a fundamental clash between individualism and selfishness and the need for social community and human communion. Yet according to Kant, humans, who possess an “unsocial sociability”, can find ways to advance the cause of freedom within the bounds of social order. Humans can be motivated to enter into social cooperation and collaboration if their individual needs are satisfied in the process. For Kant, the overall purpose of human social advancement is to create laws and institutions which will maximize individual power and freedom. So instead of seeing government and social organization as suppressing human freedom, as for example in authoritarian and centralized

regimes of control, Kant saw the ideal social organization as serving the needs of both the individual and the community.¹⁰³

The ongoing *Yin* and *Yang* of social order and individual freedom, of unity and diversity, of the whole and the parts, has been a central issue in the development of human society. Bloom highlights this conflict in his theory of historical change. For writers like Kant, the belief was that these two forces could be synthesized and made mutually compatible. Other theorists and philosophers emphasized one factor over the other, seeing an inherent contradiction between these two dimensions of human life. This difference of opinion is itself a *Yin-Yang*; the idea that social order and individuality are incompatible versus the idea that social order and individuality are reciprocal realities. We can see in the philosophy of the Enlightenment these different points of view, and consequently a variety of interpretations of what constitutes progress in human history, as well as what direction to take in the future.

The issue of social order versus individual freedom serves as a good starting point for considering another idea that became very influential during the eighteenth and nineteenth centuries. This idea was utopianism. The term “utopia” literally means “no place” or “not a place.” Sir Thomas More (1478 – 1535), a humanist thinker of the Renaissance, first used the term in his fictional book *Utopia* (1516), which described an imaginary society in which everything was morally perfect and harmonious; “utopia” was a well ordered society. More’s intent was not to imagine some perfect society of the future, but rather to satirically critique the customs and practices of his own time.¹⁰⁴ Yet More’s utopia, although peaceful and cooperative, was also static and boring. On the other hand, toward the end of the sixteenth century Francis Bacon wrote *The New Atlantis* in which he imagined an ideal society built on the principles of science.¹⁰⁵ In Bacon’s ideal society, as well as in Saint-Simon’s utopian vision two centuries later, scientists rule society, producing both social order and continued scientific advance.

Saint-Simon was only one among many modern thinkers who created utopian visions. With the coming of modernism and the Age of Enlightenment, many writers began to envision ideal societies that presumably could be realized in the future through the application of the principles of science, reason, and secular values. The optimism of the Age of Enlightenment led many people to believe that humankind could create ideal or, at least, much better societies in the future. These imaginary ideal or perfect societies of the future were usually referred to as “utopian.” Utopias were projections and predictions of ideal societies as imagined through someone’s eyes, but they were also proposals and calls to action – they were intended as seeds of revolution and reform.

According to some writers, utopian visions went through a significant evolutionary development from their earliest expressions, such as in More’s *Utopia*, to later formulations such as in Condorcet’s *Sketch for a Historical Picture of the Progress of the Human Mind*. Initially these ideal human societies were simply imagined as hypothetically existing in some other place than the society and world in which the writer lived. What the Scientific Revolution and Age of Enlightenment brought into the picture was the view that these ideal

societies could be seen as existing potentially in the future. The shift in focus was from "another place" to "another time."¹⁰⁶ Throughout human history there have been stories and fables of ideal societies or worlds that existed in the past (the myth of the Golden Age), but with the coming of modern times the ideal societies were now imagined in the future.

The futurist Warren Wagar offers a somewhat different but compatible assessment, arguing that pre-modern utopias were static and a-historical, whereas modern utopian theories were dynamic and historical, describing how humanity would progress in time to achieve a more ideal society. Modern utopian visions provided future histories.¹⁰⁷

Though there is some element of truth in these generalizations, the first view ignores the historical fact that pre-modern religious thinking did contain stories and predictions of more ideal societies in the future. St. Augustine clearly believed in the future advancement of humanity on the earth, and throughout the Middle Ages there were many advocates and followers of the vision of millennialism – that an ideal human reality, lasting a thousand years, would be achieved on earth with the second coming of Christ. Wagar's generalization is also limited because Augustinian and millennial thinking, in fact, did describe a process of moving from present times to envisioned ideal states. While these historical or dynamical processes did involve supernatural and spiritual forces, still the ideal worlds envisioned were described as a result of a developmental process.

Wendell Bell in his *Foundations of Future Studies Vol. II* provides a historical review of the evolution of utopian thought.¹⁰⁸ Bell, like Wagar, sees a real value in examining utopian images of ideal societies. As Wagar states it, the study and consideration of utopian thought is "normative future studies". Utopian thought assumes some set of prescriptive values that the utopian writer thinks should be followed and realized in the future. Utopias are normative or prescriptive visions. As Bell sees it, in examining different utopian theories, we are able to see how different value systems, which by definition are normative and prescriptive, could hypothetically be realized in human society. Utopias are thought experiments of the ideal.

Other writers see utopianism as counter-productive, archaic, and dangerous. Since More seemed to imply by the use of the word that such a society did not and perhaps could not exist, the ideal of social and human perfection is perhaps unrealistic. Leszek Kolakowski has stated that "Utopia is a disparate desire to attain absolute perfection; this desire is a degraded remnant of the religious legacy in nonreligious minds."¹⁰⁹ If utopias aspire to perfection, such ideal states are impossible, for human reality is fluid rather than static. Augustine could imagine an ideal perfect world because he saw the temporal world eventually coming to an end in the ultimate fulfillment of God's plan. He believed that there was a perfect moral order determined by God. But can humans ever achieve perfection? Can perfection, without recourse to some absolute authority such as God, even be defined?

Since a utopian vision is an ideal, as well as a call for action, a central question throughout history has been how to realize the prescribed ideals of

utopian visions. Writers of the Enlightenment called for a change in thinking, from being superstitious and irrational to becoming more scientific and rational. They also called for equality and human freedom. Yet how does one realize the ideal of freedom? Given the perceived authoritarian and repressive rule of royalty and the church at the beginning of the modern era, the only way to achieve this goal was through open rebellion and revolution in order to overturn authoritarian regimes, which is what occurred repeatedly in Europe and America beginning in the late eighteenth century.

Nisbet argues that there are two central themes within modern theories of progress (what I have noted as the two apparent contradictory messages of the Enlightenment): increasing freedom on one hand and increasing power and order on the other.¹¹⁰ Further, Nisbet notes that if social perfection, however defined, was the stated goal of a progressive or utopian image, then within human history perfection has often been sought through violent and revolutionary means. People have fought to free themselves from oppression, but people have also fought to bring order and control to a “chaotic” situation. Again, progress both in theory and practice, has not turned out to be a peaceful and steady advance. It has been “punctuated” by revolution, upheaval, and violent transformation.

In the writings of Comte and Spencer we saw that there was a growing belief in the nineteenth century that progress was a fundamental law of nature; consequently writers and revolutionaries would often justify whatever means were necessary to achieve perfection through the presumed “law of progress.” Nisbet cites Karl Marx as another utopian and progressive thinker who attempted to justify the call for rebellion and revolution through the law of progress.¹¹¹ If progress is the way of the world, then we should go after it, whatever the means. As we move through the nineteenth and twentieth centuries, there have been great wars and excessive human violence committed in the name of progress – whether it has been to achieve greater freedom or greater law and order. Aside from wars among themselves, European nations often conquered and subjugated more “primitive” cultures in the name of progress and the advance of civilization. The modern story of secular progress, in fact, starts to sound somewhat similar to the story of the religious wars of the fifteenth and sixteenth centuries, which were presumably waged in the name of God and virtue. E. O. Wilson has asked whether the dream of perfection and order through science and reason was the fatal flaw of the Enlightenment,¹¹² but the dreams of perfection and order go back much further in human history. In fact, the secular ideal of progress owes a great deal to the earlier religious view of progress. And throughout history, human perfection, however defined, has often been sought through violent and disruptive means.

Whatever may be the flaws or contradictions inherent in the theory of secular progress and the philosophy of the Enlightenment (and I will discuss this point in more depth later in this chapter), secular modernism became the dominant belief system and way of life in the West in the nineteenth and twentieth centuries. In fact, modernization has steadily spread across the globe in the last two centuries. To various degrees, many areas of Eastern and Southern Asia have adopted capitalist economies, cultivated and developed high

tech industries, embraced science, assimilated Western popular culture, commercialism, and consumerism, and worked toward democratic systems of government. Further, as modernism has spread outward from Western Europe it has conquered and destroyed the indigenous cultures and economies of many non-industrialized nations.¹¹³ Modernism has been progressively conquering the world.

Modernism has come to stand for many different things. Best and Kellner list mechanical metaphors, deterministic logic, critical reason, individualism, the search for universal truths and values, political and social justice, human emancipation, unifying schemes of knowledge, and an optimistic belief in human progress as the key themes of modernism.¹¹⁴ According to Ray and Anderson, modernism has created the present world – a world of equality, freedom, justice, human rights, democracy, industrialization, urbanization, commercialization, analysis, control, science, efficiency, and the compartmentalization of life – a world in which time is equal to money.¹¹⁵ As can be seen, there are both positive and negative dimensions to the rise of modernism, and elements of both increasing order and increasing freedom embodied within it.

Perhaps more than anything else, modernism is associated with the triumph of science. The modern world, in many respects, is a creation of science. The central conviction of the Enlightenment was that reason and reason alone should guide humanity into the future. God was dethroned and replaced by science as the “locus of knowledge and value.” “Scientism” became the new God.¹¹⁶ Secular modernism was the story of Prometheus retold – knowledge of fire was stolen from God thus making humanity equal or perhaps even superior to God.

Hence, with modernism comes a renewed and evolved human hubris. A new story and new vision emerged that valued competition and self-interest, as well as the domination and control of nature. Modernists embraced Bacon’s idea that knowledge is power. Capitalists, industrialists, and technologists alike all valued the practical and profitable applications of knowledge. Modern industry and technology, modern agriculture, and our modern economy all rely upon the systematic use of scientific knowledge to enhance productivity, efficiency, profit, and control.

Control over nature, and in particular, the capacity to influence and direct the future, requires the ability to predict the consequences of our actions within the natural world. What science contributed to this goal of modernism was an unequivocal demonstration that the future to some degree could be predicted. The scientific theories of Galileo, Kepler, and Newton, among many others, provided a basis for making exact predictions about the behavior of many natural phenomena. Although the theories of science have evolved and been modified along the way, there has been a steady increase in the exactitude and range of predictions that are repeatedly confirmed through observation and experimentation. Within science our predictive power has expanded into the areas of physics, chemistry, biology, geology, astronomy, and even to some degree the human and social sciences, economics, psychology, and sociology. The philosophy of determinism does seem to apply to a great deal of nature.

There are ongoing debates in contemporary science as to the limits of determinism and predictability in nature, but there is a vast arena of complex and intricate phenomena that can be predicted based upon deterministic laws and principles.¹¹⁷ Although, many futurists want to emphasize the element of possibility regarding the future, there is no question that to a significant degree we can predict many things about tomorrow. Science has demonstrated this general feature of nature, and our modern industry and technology functions because of nature's predictability. Without some level of deterministic order and predictability in nature, our efforts to influence the future would be pointless.

A good way to conclude this section is through looking at E.O. Wilson's analysis and defense of the philosophy of the Enlightenment. In his book *Consilience: The Unity of Knowledge*, Wilson presents an overview of the goals and strengths of the Enlightenment vision of the future, arguing that fundamentally they "got it mostly right."¹¹⁸

Wilson believes that the basic tenets of the Enlightenment were that the universe was lawful and could be understood through science; that all human knowledge could be united through a set of fundamental scientific laws - laws that gave order to nature; and that through understanding and applying these laws of nature the potential for infinite progress in humanity could be realized. For Wilson, science is religion liberated from the constraints of dogma. Enlightenment philosophers and scientists had a passion to demystify the world, a thrill of discovery, a central belief in the power of reason, and a strong commitment to education. Wilson thinks that the great goal of the Age of Enlightenment and the West's greatest contribution to the world was the idea that secular knowledge (science and rational philosophy) could facilitate and drive the evolution of human rights, ethical and moral advancement, social development, and human progress. Wilson, along with the futurist Wendell Bell, sees Condorcet as one Enlightenment philosopher who clearly articulated and supported this secular view of the future. Wilson notes that Condorcet, among others, saw human progress as an inevitable expression of the laws of nature. (Recall the idea of the "Law of Progress" in the writings of Smith, Spencer, and Comte.) Thus the lawful process of nature is the engine of growth and change and the doorway into tomorrow. By understanding and controlling this process we will create a better future for humanity. The presumed gods and supernatural forces of existence are no longer seen in control. Through science and reason, humanity has become empowered.

Hegel, Marx, and the Dialectic

"The goal, which is absolute Knowledge or Spirit knowing itself as Spirit, finds its pathway in the recollection of spiritual forms as they are in themselves and as they accomplish the organization of their spiritual kingdom."

“The more conventional opinion gets fixated on the antithesis of truth and falsity... [yet] each is as necessary as the other; and this mutual necessity alone constitutes the life of the whole.”

Georg Wilhelm Friedrich Hegel

“The mode of production of material life conditions the social, political, and intellectual life process in general. It is not consciousness of men that determines their social being, but, on the contrary, their social being that determines their consciousness.”

Karl Marx

The German philosopher Georg Wilhelm Friedrich Hegel (1770 – 1831) created one of the most comprehensive and grandiose theories of reality, time, and the cosmos ever produced in Western history. Hegel attempted to synthesize in one philosophical system the diverse wisdom and teachings of all past traditions and articulate a scheme of thought that would describe in main outline the past, present, and future of all humankind and the universe. He was also clearly a philosopher of progress, believing in the inevitable advancement of humanity and reality as a whole, but he emphasized spirit and consciousness over the secular and material in his general theory of reality and progressive change.

Hegel’s impact on Western thought has been significant though his influence has waxed and waned over the last two centuries.¹¹⁹ He inspired a whole generation of German thinkers and philosophers, including Karl Marx, as well as many British and American philosophers in the late nineteenth century, but he has also been severely criticized as obscure, obtuse, illogical, and politically authoritarian by many noteworthy philosophers in both the nineteenth and twentieth centuries, such as Arthur Schopenhauer, Søren Kierkegaard, and Bertrand Russell. To say the least, Hegel’s ideas have been highly controversial.

The first thing to understand about Hegel’s philosophy is that everything in the cosmos is in motion – there is no stasis. All is flow. Hegel is Heraclitian. Second, everything is in a state of becoming. Nothing is complete unto itself. Everything is moving toward fulfillment and realization. There is no “being” – there is only “becoming.” Third, there is a direction to the universal process of becoming. This direction, which defines the nature of progress, is toward the realization of the Universal Spirit or God. God is the ultimate goal of the universal process of becoming. The universe is the becoming of God.

Hegel explained the process of becoming and the nature of progress through the concept of the **dialectic**. The dialectic is the logic of change – the *Logos*. According to Hegel the cause of progress is the dialectic – it is the engine or motive force of change. Further, according to Hegel, the pattern of progress is dialectical. Historical change moves dialectically. For Hegel, the dialectic is how things change and why they change. In particular, Hegel invokes the dialectic to

explain why history moves in a progressive direction toward the realization of God.

In the concept of the dialectic, Hegel synthesized the circular and linear theories of time. He proposed that time has an oscillatory form of growth. The idea of the dialectic implies that change moves from an initial thesis to its antithesis (its opposite), and then to a synthesis of the two polarities. Each new synthesis in turn becomes a new thesis which will produce its opposite and a new cycle of growth will begin. History therefore moves forward by encompassing more and more reality, progressively circling outward to form greater and greater wholes. History both spirals and advances. Hegel believed he observed the dialectical process throughout all of human history, where trends and ideas swing toward one direction, then in the opposite direction with elements of conflict, and eventually to a progressive synthesis.¹²⁰

In the dialectic, Hegel rejects both the Law of Identity and the Law of the Excluded Middle. First, he believes that that everything is born with its own inner contradiction – that is every thesis contains its antithesis. Everything contains its opposite; hence, “A” is equal to both “A” and “Not A.” This belief contradicts the Law of Identity. We have already encountered this kind of logic in the Taoist *Yin-Yang*: *Yin* contains *Yang* and *Yang* contains *Yin* – everything contains its opposite. Hence, for Hegel, any emergent reality instigates or produces its opposite as a natural consequence of its own existence – it creates a mirror image of itself. All realities are born with implicit divisions. In the second phase of the dialectic, Hegel rejects the Law of the Excluded Middle, that is, the logic of “either-or.” Once opposites are generated, these opposites seek synthesis and unity. A synthesis combines realities that seem mutually exclusive. Again, using the *Yin-yang* to illustrate this point, although *Yin* and *Yang* are “opposites,” they are united in the *Tao*. Similarly, for Hegel, reality is “both/and” rather than “either/or.”¹²¹

Hegel's theory of the dialectic involves two complementary forces. First, the dialectic implies that growth involves conflict, a view of history and time we have seen previously expressed in the writings of numerous philosophers and religious thinkers. Heraclitus, for one, presumably said that “the father of all things is war,” Zoroastrianism and Christianity saw history as fueled by the conflict of good and evil. Hegel, in this tradition, in fact, sees war as a necessary element in progress.¹²² Opposition is a necessary component of change. Second, Hegel also argues that opposites seek unity and synthesis. In complementation to division and pulling apart, there is a force toward coming together which fuels the second phase of the dialectic.

Recall that the ancient Greek philosopher, Empedocles, had proposed that “Love and Strife” equally direct change. Hegel's dialectic is in a sense a more modern version of Empedocles; there is a force toward unity (love) and a second force that produces difference (strife, conflict, and opposition). To draw a parallel with contemporary physics, the modern cosmologists Fred Adams and Greg Laughlin propose that the complementary attractive and repulsive forces in nature generate the evolutionary pattern of change in the universe, and in modern social theory, Robert Wright has hypothesized that the complementary

processes of cooperation and competition produce social change.¹²³ And Bloom has argued for the dual processes of reciprocity and conquest and conformity and diversity. In all these cases there are dual forces of togetherness/unity and opposition/division that create change.

The dialectic is an oscillation of synthesis/thesis (love) and antithesis (strife), generating a spiral of expansive growth into the future. For Hegel this oscillation of synthesizing love and opposing strife produces a progressive motion in time. Does love make the world go round? For Hegel, it is both love and hate. But the world does not simply go round, it moves outward and upward through this oscillatory process.

As with his logic and theory of reality, Hegel's explanation of change also bears certain similarities with Taoist philosophy. Within Taoism, the eternal continuance and rhythm of time (the *Tao*) is maintained by a cycling of *Yin* and *Yang*. For Hegel, there is also an oscillation within time between thesis and antithesis. Using Taoist terminology, Hegel's dialectic is a moving back and forth between unity (as expressed by the *Tao*) and plurality (as expressed by *Yin* and *Yang*). Because of the oscillatory and oppositional nature of change, progress for Hegel is not a smooth, direct line forward. Growth or progress is "give and take," back and forth, up and down, unity and disruption.

We have already encountered similar views of change in previous Western writers, such as Vico, Boussuet, and Turgot – progress is oscillatory, with alternating periods of integration and disintegration. Again, what Hegel articulates in his dialectical theory of change is a synthesis of the linear and circular models of time, a new *Yin-Yang* of sorts that leads to progress. Does time move in a circle or a linear direction? For Hegel the answer is a *Yin-yang* – it moves both ways.

Hegel believed that progress is inevitable. In his theory of the dialectic, he stands with other philosophers, such as Comte and Spencer, who thought that there was a natural law of progress. Built into the very fabric of reality is the force of progress, which for Hegel is the dialectic. Yet Hegel goes beyond a theory of naturalistic necessity and views progress as having a purpose or *telos*. The *telos* of history is the realization of the universal spirit – God – through the dialectic. Time or becoming is a process of the purposeful self-discovery and self-creation of God.

According to Hegel, there is a purposeful "impulse to perfectibility" within history. The general direction in history toward the realization of God produces increasing ethical and logical perfection and absolute truth and absolute freedom. Hegel believed in the possibilities of perfection and absolute truth and viewed God, as had many religious thinkers of the past, as the realization of these ideals. In general, God is the "Absolute" relative to which everything is measured and relative to which everything is moving.

Yet within Hegelian philosophy, God is not separate from nature and the world, but rather the evolution of the cosmos is the means by which God becomes realized and self-conscious.¹²⁴ Hegel, like Spinoza, is a pantheist - the universe is God. Each new synthesis in history, according to Hegel, is an incomplete perspective on the whole, and in instigating its own opposite, the

original perspective is balanced by its mirror image. The new synthesis that arises combines both earlier perspectives – broadening the view of the whole. This process of an ever expanding perspective on the whole continues toward God and the absolute truth - the conscious synthesis and realization of all perspectives and the whole.

Since Hegel believed that all perspectives on the whole are limited (except for God's), he viewed all human belief systems as culturally and historically constrained and relative. What we see and what we understand is always from a particular point of view in space and time and is naturally colored and influenced by our localized perspective.¹²⁵ Just as Kant had seen all human understanding structured in terms of categories that filtered and organized consciousness, Hegel sees the human mind structured and filtered by history and culture.

What might seem paradoxical in Hegel's thinking is that he saw his own philosophy as somehow providing a universal and all-encompassing vision of reality, in spite of the fact that according to his very philosophy all human belief systems are historically and culturally bounded. Hegel presents a relativist theory of human knowledge but excludes himself from it. Hegel desired to capture the whole.

In fact, Hegel's overall philosophy is exceedingly holistic. It is the whole which is ultimately most real and true. Every finite thing finds its reality within the whole and all finite things are steps toward the realization of the whole. God or the ultimate whole is also that which is ethically and logically perfect. God encompasses and resolves all contradictions and provides an absolute benchmark for all ideals. God is the Absolute Truth and the Absolute Good. Reality, truth, logic, and the good are all anchored and defined relative to this ultimate whole.

Progress for Hegel is holistic. God provides the unifying direction toward which everything is moving. Since God or Universal spirit is the absolute whole, encompassing everything, progress is movement toward the whole. Although Hegel describes progress as moving toward greater freedom, an idea we have seen expressed in many philosophers of the Enlightenment, Hegel ultimately sees progress as an absolute integration of everything into God. Thus Hegel is usually seen as siding with those theorists who believed that progress was toward increasing order and integration.

Hegel is often referred to as a German idealist, since he believed that mind creates reality. Ultimate reality is therefore mind – in particular the conscious mind of God - and the end result of all progress is the realization of this absolute mental reality. God is pure thought thinking about itself. God is also pure self-consciousness, since God is everything and consequently there is nothing beyond God for God to think about. In essence, the nature of God is God contemplating God. God is God's Idea of God. Hence, the entire motion of progress is toward a purely mental and spiritual reality – a theory we have seen expressed throughout many earlier religious and philosophical traditions.

Hegel is also seen as both a rationalist and a romanticist – a synthesis of opposites - since on one hand, he views history as a rational process, which is the logic of the dialectic working its way out through time, and yet, on the other

hand, he views history as filled with conflict and passion.¹²⁶ To recall, Hegel sees war as a necessary component of progress. Since Hegel saw his philosophy as encompassing and synthesizing all past philosophies and points of view, through the logic of the dialectic, it is not surprising that there are both Apollonian and Dionysian dimensions in his theory.

Nisbet argues that Hegel follows the general line of thinking in nineteenth-century Germany in viewing progress primarily in holistic or group terms. It is the whole that evolves. In particular, according to Nisbet, German thinkers emphasized the importance of the national state. Hegel, for one, believed that all conflicts inherent in the dialectic – between the secular and the spiritual and the individual and the state, for example - would be fused or resolved within the perfect realization of the state, which he saw occurring in his native Germany.¹²⁷ Hegel stated, “The German spirit is the spirit of the new world. Its aim is the realization of absolute Truth as the unlimited self-determination of freedom ...”¹²⁸

From this quote we can see that Hegel connected the evolution of his native Germany, a nation state, with the full realization of human freedom. For Hegel, a nation is a spiritual entity and the embodiment of ethical ideals. According to Hegel, “The state is the Divine Idea as it exists on earth”.¹²⁹ It is the national state that supports the full expression of human identity and individuality. Hegel sees history as leading to increasing individual freedom, but freedom as realized in the context of community and the whole - that is, for Hegel, in the context of the national state.¹³⁰ Without the state there is no freedom. And pushing this holistic logic to its ultimate conclusion, it is God – the absolute whole – which is absolutely free. Paradoxically, for Hegel, freedom does not come through a world of separate and autonomous individuals, but rather through increasing participation in the whole. Hence, Hegel attempts to synthesize the apparently contradictory messages of the Enlightenment – progress moves toward greater social order versus progress moves toward greater individual freedom.

The contemporary social and political writer Francis Fukuyama in his book *The End of History and the Last Man* argues that it is Hegel’s emphasis on the growth of human freedom that is central to his philosophy of historical progress. Although Hegel sees human freedom as only truly realized in the context of the state, according to Fukuyama, Hegel’s vision of the ideal state toward which humanity is moving is the liberal democratic state which truly supports human freedom. Again, although freedom is realized in a social context, that social context at an individual level involves the “reciprocal recognition” among citizens of each other’s individuality, value, and self-determination. (We all agree to respect each other.) Just as Hegel sees a general direction to time in the realization of the Absolute Spirit, Hegel also sees a general pattern to human history – a “**Universal History**” – that has as its goal and trajectory individual freedom. To quote from Hegel, “The history of the world is none other than the progress of the consciousness of freedom.” According to Fukuyama’s interpretation of Hegel, history is a struggle and conflict against authoritarian masters and oppressors and the “end of history” is a realization and fulfillment of

true individual freedom and the reciprocal recognition among humans of individual value and self-determination.¹³¹

Generally, though, Hegel is known for emphasizing the state above the individual and the whole above the parts. It is odd then that Hegel did not support the eventual formation of a global government above national states. Kant had argued for such a world organization, but Hegel felt that the nation state had an absolute ethical right to self-determination. As the twentieth-century philosopher Bertrand Russell asks, isn't a global organization a greater whole than the national state, and hence, shouldn't national states find their identity and meaning within a global government, if we were to follow Hegel's logic? Instead Hegel argues that nation states have a "moral" right and obligation in certain circumstances to wage war on each other, in the name of progress.¹³² Hegel believed that certain national states at different times achieve a leadership role in human affairs, thus apparently justifying external aggression if it serves progress. As Nisbet points out, nineteenth-century German philosophers of progress often emphasized "power" and the glorification of the state, and thus supported both internal suppression of individual freedom and external expansion and conquest to realize national ideals in the name of progress.

As an overall assessment of Hegel and his philosophy, I think that the dialectical theory of change, and in particular, the idea that change involves an oscillatory process between integration and diversification, captures an important dimension of reality. Polarization and synthesis appear to be pervasive and reciprocal processes in history. At the human and social levels, ideas do seem to often instigate oppositional reactions, which in turn provoke attempted syntheses. Further, the incompleteness of natural realities and their interdependency and interconnection into the whole also seem valid points regarding how the universe is organized. Hegel quite rightly rejects the notion that reality is composed of absolutely distinct and separate entities. Everything does depend on everything else and things interpenetrate, nothing being complete unto itself. If there is a flaw in Hegel's thinking on this point, it is that he sides too much with a holistic perspective. Everything may be interdependent, but following a Taoist logic, everything also has a dimension of distinctiveness and individuality. Hegel's extreme holism is particularly apparent in his notion of an absolute, all encompassing God or Spirit. Although Hegel's dialectic implies that everything is incomplete, possessing inner contradiction, and in a state of becoming (rather than being), he proposes that there is an Absolute which is perfect, complete, and consequently beyond time, or more precisely, at the end of history and time. This combination of unending becoming with an absolute and finalized being is itself a contradiction – perhaps in need of a further dialectic. But Hegel anchors his whole philosophical system to his notion of the Absolute. It is, though, not at all clear whether perfection is a viable idea or whether time (or human history) will come to an end. Is there an absolute whole? Can there even be an absolute whole? Everything we have learned about nature and human history seems to imply incompleteness and never-ending becoming, rather than some final resolution and perfect state. Underneath Hegel's modern abstract philosophical system is the ancient Christian view (or perhaps we should say Zoroastrian view)

that time is moving toward completion and resolution in a perfect and complete Godhead.

Hegel and his philosophy would, in fact, instigate numerous and varied counter-reactions and criticisms, thus fulfilling the prediction of his own philosophical system. Although Hegel wished to have the final word in his all-encompassing scheme of thought and theory of the Absolute, he instead became another thesis provoking its own antithesis. In the minds of many, Hegel was either incomplete or in error.

One writer who was both influenced by Hegel and yet critical of him was Karl Marx (1818 – 1883). Marx adopted Hegel's dialectical theory of change, viewing history as an ongoing conflict of opposing forces that progressively lead to higher more advanced syntheses. He also saw an overall direction to history and a final ideal state toward which humanity was moving; that is, like Hegel, Marx subscribed to the ideas of a "universal history" and an "end to history."¹³³ Further, Marx was a champion of human freedom (as well as human equality), and like Hegel, saw freedom as something realized in a social context. Where he differed from Hegel was, as Marx put it, "standing Hegel on his head," and arguing for a materialist philosophy of history rather than an idealist one. If in Hegel, mind moves matter, in Marx, matter moves mind. Additionally, Marx was more action-oriented in his philosophy, not being content to simply understand human reality, but desiring to concretely influence the course of events. As Marx stated it, "The philosophers have only interpreted the world in various ways: the point however is to change it."¹³⁴ Hence, whereas Hegel created a grand metaphysical system of thought, Marx created a philosophical "call to action" that would impact billions of people in the century ahead.

In order to set the historical context for explaining Marx's vision of progress it is important to briefly summarize the Industrial Revolution that was sweeping across Europe and America during the eighteenth and nineteenth centuries. This overview of the Industrial Revolution will also help us to understand the rise of Romanticism which will be described in the next section.

As discussed in the previous sections of the chapter, beginning in England in the seventeenth century, modern factories emerged that accelerated the growth of production throughout the modern West. Fueled by technological inventions, such as the steam engine, and ongoing discoveries in the sciences, such as in chemistry, physical mechanics, and a bit later, the study of electricity, and organized in terms of new principles of efficiency, division of labor, and management in industrial production, the Industrial Revolution generated a great upsurge in the manufacturing of material goods and appeared to many to be creating a world of plenty for citizens of the modern world. As noted in the earlier discussion on science, Newtonian physics provided a new model or metaphor for the organization and operation of human society – the machine and in particular, the mechanical clock. Inspired by this new mechanistic metaphor and the ongoing success of the physical sciences in bringing order and intelligibility to the world of nature, the world of industry became a key element in the new vision of the modern world emerging in eighteenth-century Europe. Many visionaries in the eighteenth and nineteenth centuries, such as the Lunar Society in England,

saw great value in science and associated technological developments, espousing a “pro-machine” philosophy and being very optimistic about the future of progress supported through scientific and industrial advancements. The Lunar Society, in fact, inspired by the promises of the physical sciences, contributed many practical and industrial developments and realized the importance of marketing in stimulating the growth of industrial economy. Also the philosophy and practice of capitalism provided another key ingredient in the growth of the industrial economy, producing ongoing innovation through competition among businesses and the creation of wealth. As one other important factor, the Protestant ethic, so argued the sociologist Max Weber, supported a philosophy of diligence and hard work as the road to happiness and personal fulfillment, providing a growing working class of people who would toil for long hours in factories believing in the value of what they were doing. In general, the Industrial Revolution provided a new image of the future, built on material production, a capitalist economy, hard work, and the accumulation of its bounty in the form of increasing material possessions and financial wealth. In the process, a consumer society was being born.

Yet, as soon became apparent, there were various problems associated with this new vision and way of life. Factories, first appearing in rural areas, moved into the cities when steam replaced water as the primary source of power, and not only were multitudes of people displaced from their villages to work in the urban factories, but huge inner city working class slums arose to house all these workers and their families. These new working class urban areas suffered from poor sanitation, crowding, pollution, and in general abysmal living conditions. Wages were usually poor and children, along with adults, were recruited into the workforce where they were expected to work impossibly long work days and where they suffered from disease, infection, depression, and often death as a consequence. Work in factories was invariably monotonous and mechanical (the dark side of the metaphor of the smoothly running machine), and the new factory worker had become nothing more than a “hired hand” with no say or power over the quality and operation of his working environment. To add insult to injury, while the working class lived a poor and dark existence, the capitalist owners of business and industry were accruing huge amounts of wealth at the expense of their employees.¹³⁵

It is in the context of this industrial and capitalist world of the nineteenth century that Marx developed his ideas about history, the nature of progress, and critique of modern life. Nisbet provides a concise description of the essentials of Marx’s theory of history and progress. According to Marx, history involves an ongoing conflict of social classes, between the “haves” and the “have nots.” There are stages to this class struggle, each stage achieving a higher level of human equality and logical consistency; that is, by Marx’s criteria of progress, history advances through conflict and resolution. The historical process of repeated conflicts and resolutions is inevitable according to Marx; there is an overall law and natural direction to history. The ultimate end point of human history will be a utopian state of equality among all people, a resolution of all class conflicts, and the elimination of capitalism and competition. There will also

be an end to personal ownership and private property in this utopian state. This ideal state – a “**communist**” state – will be realized through centralized control that serves the collective will of the masses.¹³⁶ Though Marx stresses the “scientific” dimension to his thinking, attempting to describe and extrapolate on the facts of history, his philosophy contains a strong moral element as well.¹³⁷ He views the lawful culmination of history as a morally ideal state, with the elimination of exploitation, human misery, and inequality.

When Marx described his philosophy as materialist, he meant that the foundation of human identity and human society is its physical economy. It is the triad of natural resources, means of production, and means of distribution that defines the economic foundation of a society and supports all its higher psychological, social, and cultural functions. In this sense, Marx is an economic determinist who believes that it is the economy that determines and controls other aspects of a society. For Marx, since the rich capitalists controlled the economy, they controlled all other aspects of the world.

Further, for Marx the distinctive quality of humans is their capacity to make things – to produce – hence he labels our species “*homo faber*” (man the maker). Literally we are what we make. What is basic to humans is their mode of action – their physical behavior - and Marx describes human behavior as an interactive process with the surrounding physical environment. Humans are physical beings who interact with and manipulate a physical environment, making physical things and often exchanging these things with each other. We are material beings making and distributing material things in a material world. For Marx, all the major forms of knowledge and consciousness (for example, science, art, philosophy, and religion) emerge out of this physical foundation of matter and action and ultimately serve and find their value in the physical world. For example, the value of knowledge lies in its consequences for action and the creation of material things. Literally, for Marx, knowledge is practical power.¹³⁸

According to Marx, the ideology and values of a society are a product of economic power. Those who control the means of production are the most powerful class within a society and, to justify their position and right of power, determine the predominant belief systems and ideals of that society. These central ideas of the society legitimize those in power. Since social power and ideological supremacy are based on economic power, the conflict of social classes within a society is over who controls the means of production and material power.¹³⁹ History is a struggle for material power, and what is true and what is right is determined by who possesses material power.

Marx believed that the capitalists controlled the means of production in modern Europe and consequently possessed all the social power. Further, according to Marx, the capitalists had unfairly accrued the vast surplus of material wealth generated by this economic system. Workers were exploited and forced to engage in long hours of hard physical labor that fed the pocketbooks of the wealthy capitalists. Hence, whereas many early philosophers of the Enlightenment saw capitalism as leading to a better life for all, Marx saw capitalism as a form of oppression that created a wealthy class and impoverished the worker class. There was not enough distributive justice in the capitalist

system – resulting in a society of haves and have nots. To achieve equality among all humans, which meant, among other things, equal social power, the capitalist system for Marx had to be overthrown.

Marx also believed that capitalism “alienated” the workers from both what they produced, as well as their true human identities. Workers produce what capitalists determine they will produce, and workers do not keep the products of their industry. Workers do not find a creative outlet in production and the products they make are sold to others. If we are what we make, then in a capitalist system, what we make is not of our own choosing and does not even belong to us in the end. It belongs to the capitalists.¹⁴⁰ Capitalism robs us of our identities and freedom of self-determination.

Marx, in general, is critical of the commercialism, consumerism, and monetization of human life that is associated with capitalism. Capitalism leads to the triumph of the economy over all other aspects of social life. Everything produced becomes commerce with a marketable value. The monetary value of things becomes the defining criteria of the worth of man’s creations. Life becomes organized around the production of commodities. In fact, individual human beings become commodities who sell their skills and labor for a price, that is, for wages. Individual well being gets defined in terms of the consumption of goods and the overall health and quality of a society is judged in terms of level of production and consumption.¹⁴¹

In many important ways Marx is viewed as anticipating contemporary critiques of the capitalist economic system and the social-psychological problems that it generates. Yet if Marx is prescient in his analysis of the effects of capitalism, he is also deeply rooted in the past in his vision of an ideal society. The central human values he supports, which he believes capitalism does not provide for, are social harmony, individual happiness, freedom and self-realization, and human equality. These values, as Wendell Bell points out, are common ideals identified in many earlier utopian visions.¹⁴²

Bell views Marx as a utopian thinker, who describes an ideal society – in fact a “perfect society” – in the future and presents arguments for the desirability of this ideal society and even proposals for how to go about achieving it. As with other utopian thinkers, Marx provides a critique of the world that he lives within and outlines a utopian solution explicitly formulated around eliminating the perceived flaws and problems of his world. The good and the bad are reciprocally defined.

In Marx, as with many other earlier futurists and utopian thinkers, there is a conflation of predicting the future with identifying what is preferable or desirable in the future. It is one thing to make predictions of what will happen in the future – it is quite another thing to identify what one would hope or prefer to happen in the future. Marx clearly makes a variety of predictions about the future. At the most general level he predicts the rise of socialism and the collapse of capitalism. But he also sees this future as morally desirable – the world will improve with this change from capitalism to socialism. He believes that what will be is what is preferable because he thinks that there is a natural progressive process at work within history. Good is going to triumph. This is the same general mindset that we

found both in religious views, such as Christianity, and secular views, such as in Spencer and other theorists of natural progress. This is the same point of view we find in Hegel. The world is necessarily, due to either God or the laws of nature, getting better. Both the philosophers of the Enlightenment as well as the religious thinkers before attempted to derive or justify an “ought” from an “is.”¹⁴³

Also, as found in other writers of the period, there seems to be a conflation or blurring of natural necessity and individual choice in Marx. Marx speaks as if the eventual rise of socialism is a necessary consequence of the flow of historical events. He sees the future as determined and does not seem to acknowledge or believe in the uncertainty of the future. Again, both religious and secular thinkers in the West often described history and the future in such a deterministic fashion. Yet Marx also presents a “call to action”, arguing that workers should rebel against the oppressor and exploitive capitalist system – that is he speaks as if individual choice and action matter. This same kind of argument can be found in other theorists of progress. The necessary direction of progress is identified – as a global or cosmic force at work – and people are advised to jump on the bandwagon and help to facilitate this process. But in the long run, it really doesn’t make any difference if, as these theorists also posit, human society and the universe as a whole is heading that way regardless of what we do or don’t do. Whether we decide to be good Christians or not, God will triumph in the end. If one believes in natural or supernatural necessity, then choice doesn’t really mean anything in determining the overall course of events. (You do have a choice though in whether you want to be on the “winning” side or the “losing” side, but what kind of a choice is that?)

Thus Marx is a good example of a contradiction that exists within Enlightenment philosophy and the theory of secular progress. Enlightenment philosophy stressed the importance of freedom, yet this same philosophy also embraced the deterministic model of nature provided through science. But how can there be freedom in any true sense of the word, if life is determined. There is no real power or significance to choice unless the future is open to different possibilities.

Marx, like Hegel, believes in perfection and thinks that perfection will be achieved sometime in the future; he also believes in an “end to history.” Again, this view reflects an ancient mindset to be found in mythic and religious thinking. Zoroastrianism and Christianity both envisioned an ideal perfect state achieved at the end of history and the end of time. Yet one can question both the idea of perfection, as well as the idea of an end to history and time. How can one legitimately argue, with any credibility or certainty, that there is some ideal human state or social reality that can not be improved upon? Further, just as in Hegel, Marx offers a dynamic theory of history with ongoing change across the ages and then brings the whole process to an end in a perfect social state. He combines a theory of ongoing becoming with a static end.

Finally, Marxist thinking leads to another problem that also shows up in Hegel. If there is some ideal reality toward which human society is headed, then it could be argued that whatever means are necessary to get there should be implemented. The ends are used to justify the means. (Recall Machiavelli.) The

authority of both Marx and Hegel has been used to justify war, violence, and oppression as necessary means toward some desirable end. In the case of Hegel, the supremacy of the ideal state, as envisioned to be developing in Germany, was used to justify German aggression and war against “inferior” and less advanced states. In the case of Marx, the promised equality and universal happiness to be realized in a communist state was used to justify violent rebellion and subsequent repression and control of citizens in Russia. In both cases, the inhumane and violent means were justified in terms of ideal ends. Once again, as since time immemorial, violence and war are connected with future consciousness.

As Wendell Bell points out, the value in Marx lies in his comprehensive and telling critique of the flaws of capitalism and the humanitarian ideals he proposes that somehow need to be addressed in human society. Although the communist experiment seems to have failed in the Soviet Union, it does not necessarily follow that capitalism is a morally superior or perfect system. Part of the ongoing critique of modernization has centered around the numerous problems that capitalism seems to generate, for example, excessive commercialization and consumerism and an ever growing unequal distribution of power and wealth. Let us now turn to another wave of thinking that emerged in the nineteenth century and produced perhaps the strongest and most powerful critique of modernization, Enlightenment philosophy, and the rise of capitalism yet to come - Romanticism.

Romanticism

*“The world is too much with us; late and soon,
Getting and spending, we lay waste our powers:
Little we see in Nature that is ours;
We have given our hearts away, a sordid boon!”*

William Wordsworth

“The world is my idea....The world is my will.”

Arthur Schopenhauer

Though Marx and Hegel modified, if not critiqued, certain aspects of the theory of secular progress, both believed that the general idea of progress accurately described the flow of historical time and provided a guiding theme for understanding the future of humanity. Not everyone though in the modern West was sympathetic to the philosophy of progress. Criticisms of the philosophy of the Enlightenment, modernism, and secular progress, go back to the eighteenth century at least. Barely had the modern age been born when it came under attack.

The strongest attack on the theory of secular progress arose in the nineteenth century in the philosophy of **Romanticism**. Romanticism contradicted almost all of the central principles of modernism, science, and rationalism. Recall the distinction between Apollonian and Dionysian modes of consciousness. Enlightenment philosophy, with its emphasis on reason, falls into the Apollonian mindset; as Wilson refers to Enlightenment philosophy, it was “bloodless,” focusing on rationality, form, and function. The opposite of the Apollonian mindset, the Dionysian, provided the impetus behind philosophical Romanticism which recoiled not only against modernism, science, and reason, but also against capitalism, industrialism, and the general optimism of the period. Romanticism provided a much different approach and attitude toward the future, as well as the past, than the rationalism and instrumentalism of modernism and the Enlightenment.

Richard Tarnas, in his *The Passion of the Western Mind*, states that two streams of thinking emerged out of the Renaissance – the rational and the romantic. According to Tarnas there were, however, some commonalities between these two ways of thinking: Both were Promethean, challenging the sovereignty of the gods and tradition; both embraced a humanist perspective, setting man in the context of nature; and both had classical origins, in particular, the Apollonian and Dionysian mindsets of ancient Greece.¹⁴⁴

Even if the origins of Romanticism go back to the Renaissance and classical Greece, it was the increasing influence and ubiquitous presence of modernism, science, and Enlightenment philosophy that instigated the full and intense expression of Romanticism in the nineteenth century. Even if there is a common cultural root, modern Romanticism vehemently attacked and rejected modern Western rationalism. Modern Romanticism set out to dethrone rational Enlightenment and everything associated with it from its position of cultural power. This critique and opposition – this antithesis to reason and progress - created a deep intellectual and cultural schism in modern Western society, or as Watson refers to it, the “modern incoherence,” which is still with us up to the present day.¹⁴⁵

Whereas the Enlightenment emphasized reason, Romanticism embraced emotion, passion, “sensibility”, and the a-rational or irrational. Romanticists examined the “dark side” of humanity and not just humanity’s higher aspirations and abilities. In Romanticism we see the beginnings of the exploration of the unconscious. Whereas Newton’s vision of a clockwork universe inspired a mechanistic and machine model of nature and even human society among secular modernists, romantic philosophers saw nature as alive, inspirited, and organic. Romanticists often reveled in rare nature, in opposition to the constraints and refinements of civilization. As we have seen many philosophers of secular progress championed the importance of order; romantic philosophers embraced chaos, turbulence, the strange, and the macabre. Beauty and the aesthetic, for the Romanticists, took precedence over the utilitarian values of capitalism, industrialism, and technology. Romanticists, often of a more literary than philosophical or scientific bent, saw the dramatic in life; they valued inspiration, imagination, creativity, revelation, and mystery. Whereas science searched for

grand abstractions and universal knowledge, the Romanticists valued uniqueness and diversity. Whereas the Enlightenment searched for scientific certainty, the Romanticists embraced uncertainty. The Enlightenment wished to rid humanity of superstition and the supernatural; the Romanticists reasserted the value of ancient myths and the mystical. If the Enlightenment, science, and the Industrial Revolution emphasized understanding and transforming the external world, the Romanticists turned inward, delving into the subjective and the deep inner self. In general, Romanticism brought back into the human equation, in great force, the affective, primordial, subjective, and concrete dimensions of humanity that, in their minds, had been repressed and rejected by the rational and modernized world.¹⁴⁶

The Romanticists, in numerous ways, questioned the secular and rational ideal of progress. First, they feared that science was more Faustian (a deal with the devil motivated by human ego and vanity) than Promethean. Instead of Bacon's notion of conquering nature through science and technology, many Romanticists wanted to return to a purer harmony and unity with nature. If science wanted to detach itself from nature, adopting an objectivist stance on reality, Romanticists wanted to immerse themselves in nature. Second, following from the first point, Romanticists saw modern civilization as de-humanizing and alienating. Not only was modern humanity cut off from nature through living in cities, but with the scientific emphasis on objectivity, humanity was also cut off from the inner or subjective aspect of reality. Romanticism emphasized the subjective side of human existence and rejected the Enlightenment ideal of a single objective truth. Third, as we have seen, progress and civilization bring in many ways increasing constraint and regimentation. The individual is consequently suffocated in the name of progress. Although philosophers of the Enlightenment often championed the ideals of freedom and self-expression, the Romanticists saw the results of increasing modernization as producing the opposite effect. The Romanticists firmly believed in the value of the individual, which they thought was being undercut in the new modern world order. As noted earlier, the Enlightenment emphasized the apparently contradictory themes of individualism and order; the Romanticists resolved this contradiction by elevating individualism and rejecting social order. Fourth, for the Romanticists, capitalism, industrialism, and consumerism were turning humans into machines – cogs in the wheel of progress and production – who lose themselves in things at the expense of human feeling and human intimacy. The early twentieth-century historian and philosopher, Oswald Spengler, who was strongly influenced by Romanticism, argued that the mechanistic and the commercial – two central themes of secular progress – were incompatible with humanism and were producing a “decline of the West.” Echoing a view that would run through Romantic philosophy, Spengler argued that the West needed to reassert the value of the hero over the trader.¹⁴⁷ The highly influential Romantic poet Lord Byron (1788 – 1824) elevated the artist as hero to a central position in Romantic philosophy. In short, to the Romanticists, a philosophy of progress built on rationality, objectivity, mechanization, and efficiency is not progress at all – it is regressive. It ignores the human heart, destroys spontaneity, kills unique

individualism, and isolates humans in the unnatural constructions of technology, industry, and urbanization. As Max Weber, the late nineteenth-century sociologist and economist stated, modernity created a “bureaucratization of the human spirit” and placed the human being in an “Iron Cage.”¹⁴⁸

Although the Romanticists were critical of the secular theory of progress and valued the mythical traditions of the past, both Western and Eastern, they were not so much dismissive of the future as simply offering an alternative vision of tomorrow. As one of their general points, emotion rather than dispassionate reason needs to guide the future. In more concrete and personalized terms, the Romanticist replaced the scientist with the artist as the central guiding archetype and consequently replaced science with art as the critical mode of consciousness and knowledge for experiencing and understanding life. If objective truth was the ultimate goal of science, Romanticists elevated beauty to center stage instead. Just as the search for truth had been for many early scientists an effort to read the “mind of God,” the creation of beauty became the spiritual quest for the Romanticists. Through the novel, poetry, and the visual and musical arts, the Romanticists created an alternative picture of the world to that of science, and defined a different set of ideals to strive for in creating a better world.

Another important central theme in Romanticism, mentioned above, is creativity. Watson, in his discussion of Romanticism, which he describes as “the great reversal of values,” identifies the elevation of creativity as pivotal to Romantic philosophy and art. For the Romanticists, “man” is fundamentally a creative being, who invents both the individual self and values. There is no true self or definitive set of values. Ultimately what is central in human life is created rather than discovered, and thus lies outside the scope of science. Life is art – life is will. The centrality of human will and self-realization, as opposed to reason and objectivity, are clearly apparent in the Romantic philosophies of Fichte, Schopenhauer, and Nietzsche (see below). Hence, it is the creative artist, often solitary and alienated from mass conformist human society, struggling to realize his or her unique vision, that epitomizes the Romantic ideal.¹⁴⁹ It is through the Romantic symphonies of Beethoven that we can experience the meaning, struggle, and direction of life, rather than through the rationalist philosophies of Descartes and Kant.

As noted above, the Romantic reaction produced a highly polarized dichotomy in thinking in Western culture. In the earlier past, we have seen various other oppositions of thought, such as faith versus reason, left versus right brain, and religion versus science. In modern times Romanticism reasserts, with a vengeance, the Apollonian versus Dionysian. Romanticism looks at the subjective and is associated with the study of the humanities; rational Enlightenment emphasizes the objective and supports the study of science. Perhaps, as J. T. Fraser argues, science versus art and the humanities reflects a fundamental difference in temperament among humans, with different people preferring one mode of consciousness over the other. There have also been individuals who have attempted syntheses of these two modes of thinking. Even if the conflict of the Romantic and the rational runs back through much of recorded history and even if it reflects a fundamental difference in human

temperaments, it would seem, following the logic of Hegel, that any viable and comprehensive approach to the future needs to find a way to synthesize or bring into balance these two ways of looking at life – it needs to heal the “modern incoherence.”

At this point, I want to examine more closely three philosophers of the Romantic era who were both highly influential and who express in unique and significant ways the philosophy of Romanticism. These three philosophers are Arthur Schopenhauer, Søren Kierkegaard, and Friedrich Nietzsche. All three of them, in the true spirit of Romanticism, attacked what they perceived as the excessive rationalism of the modern West.

Arthur Schopenhauer (1788 – 1860) was a somewhat younger contemporary of Hegel and highly critical of him, accusing Hegel of producing “the craziest mystifying nonsense.” Schopenhauer followed Kant in arguing that all human experience and knowledge was ultimately subjective and consequently humans could not possess true knowledge of the objective world – the “thing-in-itself.” Thus Schopenhauer rejects the Enlightenment and scientific aspiration for objective truth – he thinks it is impossible. Schopenhauer’s emphasis on the centrality of subjectivity aligns him with Romantic philosophy, which as noted above, emphasized the subjective over the objective.

But Schopenhauer paradoxically does attempt to look beyond subjective experience and explore the nature of ultimate reality. If the conscious world is nothing but “ideas” – that is creations of the mind – then the ultimate ground of being is what Schopenhauer referred to as “the Will.” It is on this point that he quite explicitly rejects rationalism and Hegel in particular. Rationalism, to recall, sees reason as the road to knowledge, and pushing the argument even further, Hegel sees reality as ultimately rational. For Hegel, reality can be understood through reason because reality is rationally structured. Schopenhauer, on the other hand, does not believe that ultimate reality is rational at all. Rather, reality is fundamentally a primordial force – a will – a wanting and desire. The “Will” is a-rational: it is not a “Logos” but an energetic impetus and motive of self-assertion and gratification. It is force rather than form. It is “Will” that drives reality – that creates it in its need for growth and expression. Everything is a manifestation and sublimation of “Will.” There are two primary expressions of “Will” – procreation and destruction, that is, “Will” creates “becoming” and “passing away.”

In some ways, “Will” sounds like the Hindu god *Shiva*, and that may be no accident since Schopenhauer studied Eastern religion and was definitely influenced by it. (Romanticism was strongly affected by the “Oriental Renaissance” - the rediscovery and renewed appreciation of Eastern culture in nineteenth-century Europe.¹⁵⁰) Schopenhauer believed that there was really just a single all encompassing “Will” that moved everything. Individuation was actually an illusion of subjectivity – ultimately, as in Hinduism, all is One. The conscious sense of separation does not really exist. Individual self-determination and freedom is also illusory since all action is really an expression of the universal “Will.”

Thus for Schopenhauer past and future are ultimately the same – of creation and destruction; all of time is simply the never-ending expression of the

universal “Will.” According to Schopenhauer, “History shows on every side only the same thing under different forms...”. Because of this vision of reality and time Schopenhauer is often seen as a pessimist. He viewed all the various progressive and uplifting philosophies of both past and future, with very few exceptions, as being unrealistic and Pollyannaish. As is often the case, people who are seen as pessimistic view themselves as simply realistic – as did Schopenhauer - and mostly everyone else as engaging in delusory wish-fulfillment.¹⁵¹

If Marx turned Hegel on his head, the legacy of Schopenhauer is, to turn both Hegel and the Enlightenment inside out. Reason does not rule reality – there is no “Logos” to either discover or emulate. Reality is a primal motive force that creates and destroys and humans are nothing but expressions of this force of will. The emphasis on will over reason would become a central theme in later Romantic philosophers, notably in Nietzsche, who studied Schopenhauer. The idea of will as fundamental to human reality was also connected with the Romantic ideals of self-assertion, self-expression, and self-creativity, both at the individual and the national levels.

The Danish Christian philosopher Søren Kierkegaard (1813 – 1855) also attacked the rationalism of Hegelian philosophy, as well as the rationalism inherent in both science and Christianity. For Kierkegaard, the universe can not be understood or adequately experienced from a rational point of view, and in fact, he advocated that belief in God, contrary to any presumed proofs or historical evidence for the existence of God, must be approached as a “**leap of faith.**” Contrary to the philosophy of the Enlightenment, reason, can not be an ultimate foundation for either action or belief.

For Kierkegaard, it is the concrete lived experience of the individual which is of primary importance. Attempts to encapsulate the universe in an abstract universal system of thought, such as in Hegel, or science for that matter, totally miss the basic fact that life is not experienced from an abstract or general point of view, but from a unique and individual point of view. Philosophy must address life as we find it; hence, individuality and subjectivity should be our starting point rather than abstract universality. Kierkegaard develops his philosophy from the point of view of the subjective lived experience of the individual.

Pivotal to Kierkegaard’s philosophy is the theme of individual freedom in the face of the uncertainty of existence. Humans are decision makers; we are always faced with various choices – “either-or” situations. Life is different possibilities branching out in front of us, and we have to make choices regarding which paths to follow. The future is irreducibly a set of “either-or’s.” Further, for Kierkegaard all decisions are based on values. But values contain a subjective element – values are acts of choice as well. There is no set of universal standards for determining what values or decisions are best. According to Kierkegaard, values are based upon what he refers to as “subjective truths.” It is the inner subjective sense of what feels right or true that determines whether a value is embraced or rejected. Consequently, reason can not be the ultimate guide in life, since we can not, through reason, determine what is best – we must experience the subjective validity of a value. Since there are no guarantees in

any of this, choosing values and making decisions involves an element of faith. The future is uncertain choices based on faith.

In fact, Kierkegaard sees the self as an act of choice. As self-reflective beings, we can determine what kind of person we choose to be. Kierkegaard uses the expression “authentic self” to refer to the type of self that is freely chosen by the individual. He also uses the expression “knight of faith” to refer to those people who realize that they are free to determine their own destiny. Kierkegaard believed that modernity, through the social and economic forces of mass conformity, was destroying individuality (a criticism we also saw in Marx) and though the promise of the Enlightenment was increased freedom, modernity was producing the opposite effect.

Authenticity in life is also based on the subjective discovery of death. Although everyone possesses the objective knowledge from early on in life that he or she will die, it requires a courageous and intentional effort of consciousness to really feel the inevitability of one’s death – to vividly imagine a time when one no longer exists. Only by feeling one’s death does one truly appreciate one’s life. Again it is the lived or felt experience of life – a subjective reality – that is of paramount importance, and it is upon this inner foundation that the creation of an authentic freely chosen life is built.¹⁵²

Kierkegaard is often seen as the father of **existentialism**, the twentieth-century philosophy that highlighted the dimension of freedom in human existence. Existentialism also emphasizes the subjective dimension of human reality. Both these themes can be found strongly expressed in the philosophy of Kierkegaard. Whereas many nineteenth-century philosophers, such as Marx, Hegel, Comte, and Spencer, saw the future in terms of some universal law of progress that was moving humanity forward in time, Kierkegaard saw uncertainty and individual choice when he looked toward the future. The future is a choice rather than a natural inevitability. There is no certainty in what is to come and we must all, according to Kierkegaard, not only live with that fact, but embrace it as critical to our psychological well-being. Kierkegaard is a philosopher of courage. Kierkegaard reasserts the importance of “either-or” thinking, after Hegel had, as Kierkegaard asserted, obscured the distinction by arguing that everything contains its contradiction. Life is choices – life is risks. There are many possible futures – not just one.

Also, Kierkegaard, in true Romantic fashion, reasserts the significance of individuality and subjectivity after science and the Enlightenment had attempted to turn reality into abstract general truths. Although Enlightenment philosophers argued for the importance of individuality and freedom, they were caught in a contradiction, for they also embraced scientific determinism and the quest for general laws of nature, including laws of the human mind and human society. Kierkegaard would have nothing of this, instead arguing for an extreme philosophy of freedom in the face of an uncertain future. The second philosopher of the nineteenth century who is also seen as a main inspirational figure within existentialism, Friedrich Nietzsche, would take the philosophy of individualism and freedom even further.

Peter Watson, in his intellectual history of the twentieth century *The Modern Mind*, begins his discussion of Nietzsche with the following statement: "There is no question that the figure of Nietzsche looms over twentieth-century thought."¹⁵³ The German philosopher Friedrich Nietzsche (1844 – 1900) was one of the strongest spokesmen of Romanticism. Nietzsche attacked the supremacy of reason and the value of modernism. He argued for the importance of passion, and believed that modernism inhibited the creative and higher qualities of humanity. He rejected the Enlightenment ideals of absolute and eternal truth, absolute values, and pure objectivity. Instead, much like a psychologist, he astutely revealed and dissected the subjectivism and relativism inherent in the human mind and human cultures. He was no less critical of Christianity than modernism and argued that moral systems, secular or religious, were ways to control and maintain power over the masses. Power, creativity, and individualist expression were the key ideals and concepts within his philosophy.¹⁵⁴

Inspired by Schopenhauer's belief in the primacy of will, Nietzsche argues that life, thought, and culture are all manifestations of the "**will to power.**" The "will to power," which can also be understood as the urge for individual freedom and self-expression, is the life affirming force in reality. Nietzsche, in true Hegelian fashion, views human history as a clash or conflict between those individuals who possess and embrace the "will to power" and those people (the masses and the poor in life) who do not possess such inner vitality and drive. Nietzsche sees all the higher elements of human culture as having been created by those who possess and exercise the "will to power." Such individuals are the artists, warriors, and conquerors within human history. Such individuals create their own values, rather than submitting to the conformist values of the masses. In effect, Nietzsche, like other Romanticists before him, elevates the "heroic" archetype to center stage in human history. Moreover, he sees this archetype as providing the guiding light for humanity as we move into the future. It is not reason or faith, or social harmony and order that will be our salvation – it is the individual life affirming expression of the "will to power" that will create a better world. As he states, "I teach the No to all that makes weak – that exhausts. I teach the Yes to all that strengthens, that stores up strength, that justifies the feeling of strength."¹⁵⁵

Founded on the ideals of power, strength, and life affirmation, Nietzsche sees his philosophy as optimistic in contrast to Schopenhauer's pessimism. He believes that he sees what is good and positive in life and he prophesizes a philosophy of hope for the future built upon the eventual realization of his ideals. Yet in contrast to this philosophy of hope for the future, he is highly critical of the most important features of the modern world. There is a very pronounced juxtaposition and contrast in his writings between the innumerable failings of what is real and, in his mind, what is ideal. Highly influential, he is the great critic and dark shadow over the promises and reality of modernity. In examining in more detail his philosophy, I begin with those key metaphysical, epistemological, and ethical ideas he supports, all of which are connected with his theory of the "will to power," and from there move to his most important and basic criticisms of

modernism. All of his criticisms make sense given the basic philosophical views that he supports.

Beginning with his metaphysics and theory of reality, Nietzsche generally supports a Dionysian model of existence. One could also say that he follows Heraclitus. Reality is turbulent, filled with “sound and fury,” in flux and conflict. To quote, Nietzsche’s world is “...a monster of energy, without beginning, without end...a play of forces and waves of forces, at the same time one and many...eternally changing, eternally flooding back, with...an ebb and flow of its forms...”. This view is totally at odds with the Newtonian image of an orderly and harmonious universe. Nietzsche rejects the scientific notion of cause and effect as being an accurate description of change, instead arguing that change is due to a struggle of power between the different entities in nature. At times he does acknowledge that there is a balance in nature between order and chaos, and he admires classical art for often synthesizing the two poles of reality, but in general, he emphasizes the chaotic and Dionysian pole of existence. Further, he feels that we should embrace and participate in this “Heraclitian fire” for it is life affirming and the source of all creativity.¹⁵⁶

Ethics should serve creativity and self-expression – it should strengthen rather than weaken and constrain. Values should be life affirmative. To use a modern expression, values should “self-empower.” Consequently, there is an important sense in which Nietzsche argues for an “individualist” ethics – that is, an ethics created and affirmed by the individual that serves the individual. Russell argues that ultimately Nietzsche values war and pride, and elevates the warrior above the thinker-philosopher as the ideal human. Values should serve the “will to power.” At times Nietzsche speaks as if “might makes right” – that those who are strongest (possessing the greatest “will to power”) deserve to determine their own destiny as well as the destiny of others.

Yet, Russell also notes that Nietzsche values art, literature, and creativity. Nietzsche, in fact, believes that ethics should actually be subordinated to art and aesthetics. For Nietzsche, “art represents the highest task and the truly metaphysical activity of this life.”¹⁵⁷ In this regard, Nietzsche is a true Romanticist elevating beauty above the good, or more precisely turning beauty into the ultimate good.

Nietzsche is seen as championing a perspectivist theory of knowledge, but he also argued for a motivational theory of knowledge. All human beliefs are relative to some perspective and are expressions of some motive. He argued that there were many different valid ways of looking at reality. There are always multiple perspectives – multiple points of view - and we should cultivate the habit of trying to see things from different perspectives to gain a better understanding of reality. There is no absolute or single view that is the ultimate or best truth. Further, knowing is always an act of creativity and inventing – it is always subjective. Beliefs are relative to time and place, and we should steer clear of attempts to make universal statements. He states, “...facts are precisely what there are not, only interpretations”. Knowing (or believing), in fact, serves the “will to power” – there are no unbiased, dispassionate statements of facts. Assertions of fact or truth always serve personal ends – there is always a motive behind a

belief. As he argues, “Ultimately, man finds in things nothing but what he himself has imported into them: the finding is called science.”¹⁵⁸ In fact, Nietzsche contends that beliefs should be evaluated in terms of how they serve life. In this sense he is a pragmatist, abandoning the notion of absolute truth and instead looking for the functional value or benefit of a belief. In this philosophy of knowledge, Nietzsche dethrones both rationalism and empiricism, arguing that the “will to power” both determines what we believe and is the final criteria for deciding what we should believe.

Founded on these basic philosophical beliefs, Nietzsche articulates a multi-faceted and extensive critique of modern society. At a general level, he argues that modern society has fallen into a state of nihilism. Modern Western humans have lost faith and hope in both traditional Christianity and the promises of the Enlightenment and the theory of secular progress. In his mind, neither “world-view” delivered what it promised. Christian religion did not realize a heavenly and moral paradise on earth and secularization, science, and capitalism did not bring happiness, material abundance, and self-fulfillment to all people. Both worldviews, in Nietzsche’s mind, were too absolutist, grandiose, and universal, presenting visions that presumably explained everything and provided a path of life for everyone. Because Westerners expected too much – thinking that there were eternal truths and absolute values – they became disappointed, frustrated, and disillusioned when these excessive and unrealistic expectations were not realized.

Further, he believed that modern society had become increasingly fragmented and that individuality and creativity had been repressed. In his mind, the West had lost social spirit and cohesion, as well as vitality in its people. Instead of having a sense of community, Westerners had become isolated and separated; equally, instead of a population of unique creative souls, most Westerners were conformists, unconscious “sheep” adopting a “herd” mentality. We all walked alone, in mindless uniformity, in a state of apathy.

Nietzsche, though reporting on the generalized nihilism of his time, was not in his own mind either a nihilist or a pessimist. He believed that the psychological and moral collapse of the West, which he predicted as spreading and deepening in the immediate future, would eventually turn itself around and a new heroic age would emerge. Nietzsche admired the classical civilizations of Rome and Greece, as well as Renaissance Europe, and he believed that a new age resonant with these earlier societies, one that once again affirmed life, creativity, and positive human values, would arise.¹⁵⁹

Based on both his perspectivist theory of knowledge and his philosophy of “will to power,” Nietzsche was especially critical of both authority and conformity, which are really two sides of the same coin. Nietzsche is well known for his pronouncement that “God is dead,” by which he meant, at the very least, that modern Western humanity had lost faith and belief in God; (on this point he was simply reporting on the increasing secularization and religious skepticism of the West.) But Nietzsche was not just reporting on a sociological fact; he believed it was just as well that God was dead. Nietzsche saw Christianity as enforcing a “slave morality” on its followers. The good Christian was supposed to be obedient

to the will of God, as described in the *Bible* and enforced by the leaders of the Church. Such an approach to life was anathema to Nietzsche's belief that humans should create their own values and not conform to some absolutist authority. Recall, from above, that Nietzsche believed all absolutist claims to knowledge and value are epistemologically in error. In Nietzsche's mind, there can be no God – no absolute source and authority on knowledge and the good. People who follow God are slaves and have abandoned or forsaken life.¹⁶⁰

But Nietzsche was not just critical of Christianity in this regard. He saw conformity and submission to authority arising in many different aspects of modern life. Humans had become slaves to industry and capitalism, reduced to "industrious ants" serving the rhythm, tempo, and logic of machines and the goals of capitalists. Instead of embracing individual creativity, capitalist society valued money and utility. Nietzsche saw conformity in the social roles people adopt in following convention, again abandoning individual self-expression for a herd mentality. He also saw modern nationalism as contributing to the loss of individuality. According to Nietzsche, both the state and the machinery of capitalism destroy culture and produce mediocrity. Contrary to Marx, he did not think that what was needed was a social movement and rebellion against the oppressiveness of modernity, which would have just been another form of herd mentality, but rather individual transcendence. Finally, Nietzsche even saw science and reason as tyrants in that the philosophy of the Enlightenment presented science and reason as the absolute source of truth. Although the Enlightenment promised liberation from the authority and repressiveness of the church, superstition, and royalty, it simply created a new form of singular authority. Not that Nietzsche was opposed to science and reason, but based on his perspectivist theory of knowledge, he was simply against the idea that science and reason provides the absolute and only truth. He saw the presumed objectivity of science as a pretense.¹⁶¹

In general, Nietzsche was critical of all metaphysical schemes of thought, secular or religious. Aside from objecting to their absolutist claims of knowledge, he saw such systems of thought as life denying. Beginning with Plato's disenchantment with the world of time and aspirations toward an eternal realm, the history of metaphysics up through Hegel is a history of abandoning what is real for an idealized fictive realm. As Nietzsche states, "It was suffering and incapacity that created all after-worlds..." Life should rather be embraced, in all its turmoil, struggle, and internal contradictions.¹⁶²

Because of his Dionysian philosophy and resonance with the chaos of life, Nietzsche did not shirk from self-contradiction. In fact, he saw as one central Apollonian myth the idea of a singular consistent self. Just as there are multiple perspectives on reality, there are multiple voices within an individual. Descartes's notion of a single rational subject entails a denial of the richness of mind and consciousness. The human mind shows the same chaos and diversity as the world. We are a multiplicity of drives and ideas.¹⁶³

Nietzsche would replace modern man with a new vision of the ideal human. He believed that modern man, a victim of nihilism and conformity, was doomed. Instead Nietzsche argued for (or prophesized) the emergence of the

“**overman**” who embodied those qualities that Nietzsche saw as life-affirming. In his famous work *Thus Spoke Zarathustra* Nietzsche describes the overman and his vision of the future of humanity. In announcing the death of God, the overman fully realizes the “will to power;” he is a “warrior of culture,” a lover of dance and laughter, an artist and philosopher, and “aristocrat of the spirit.”¹⁶⁴ This futurist image of the superior human though combines both pre-modern and modern ideals, for although Nietzsche was a critic of modernity, his emphasis on individual freedom and self-expression and the rejection of authority, especially religious authority, is a modern concept and his idealized love of the artist and warrior derives from classical thinking and his vision of the self-assertive conquerors of old.

Nietzsche’s influence has been significant. There are interpretations of his philosophy that are positive, noting his accurate analysis of the problems of modernity and the nature of the human mind. But there are critics of Nietzsche as well who see his philosophy as providing a justification for war, conquest, inhumanity to man, elitism, and racial supremacy and prejudice. Bertrand Russell, one especially strong critic, sees Nietzsche’s philosophy as an expression of a “lust for power” based on an excessively negative image of humanity, a lack of empathy, and a sense of deep fear. Rather than being life affirming, Nietzsche, according to Russell, is life denying.¹⁶⁵ But perhaps most importantly, Russell argues that a philosophical ethics can not be exclusively built upon self-expression, for humans are social creatures and we can not simply disregard the rights and the feelings of others, even if they are weak and poor of spirit, a central insight that Russell sees totally lacking in Nietzsche.

Perhaps the Romantics were correct in their assessment that modernity and reason had not freed humanity but simply replaced one set of constraints with another. Yet the aspiration toward freedom and self-expression is clearly a modern ideal, and if the Romantics embraced this ideal, then they were as much children of modernity as the philosophers of the Enlightenment. The strength and value of the Romantic perspective is to bring some balance to modern visions of progress and the good life. A philosophy of the future must speak to the heart as well as to reason. It must balance the Dionysian and the Apollonian. Individuality cannot be sacrificed in the name of social order and progress. There is chaos and uncertainty in life, as well as order and predictability. Life should be approached as a drama and a work of art, as well as through abstract theory. It is important to cultivate optimism about the future, but the optimism must be realistic. Contrary to the elevated visions of the eighteenth and nineteenth century, the dark side of humanity did not disappear. In the twentieth century it came back with a vengeance.

Darwin’s Theory of Evolution

*“There is nowhere anything lasting, neither outside me,
nor within me, but only incessant change. I nowhere know of any being,
not even my own. There is no being.”*

Johan Fichte

“Hence we may look with some confidence to a secure future of great length. And as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress toward perfection.”

Charles Darwin

In this final section of the chapter I describe the development of the theory of evolution from the seventeenth through the late nineteenth centuries. Although the theory of evolution is specifically associated with Charles Darwin (1809 – 1882) and his epochal work *On the Origin of Species by Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (1859), the theory emerged over a period of roughly two centuries and involved the contributions and discoveries of many significant scientists and writers. The evidence for evolution accumulated across many diverse disciplines of study prior to Darwin. Darwin put the pieces together and added the final central element – the idea of **natural selection**, which Daniel Dennett refers to as “the single best idea that anyone has ever had” – but the scientific concept of evolution had been growing, in modern times at least, since the time of Descartes and Leibniz.¹⁶⁶

Still it is Darwin and his specific formulation of evolution that created the great public stir and controversy, raising the question of the origin and nature of the human species. Regardless of whether Dennett’s view that natural selection is the “best idea” ever is true, Darwin’s theory of evolution by natural selection has been the most influential scientific idea to emerge in the modern West, and next to the *Bible*, *On the Origin of Species* is probably the most important and influential book written in Western civilization. Darwin and his theory of evolution transformed the basic picture of nature provided by science, redefined the nature of humanity, overturned almost all metaphysical views in traditional world religions regarding the mechanism of creation and the origins of order, and laid the groundwork for a new view of time and the future. The philosophical as well as scientific implications of Darwin’s theory impact many of the most fundamental issues of life and existence.¹⁶⁷ The Darwinian revolution in thought is still in progress today – its implications so profound and deep – that the ripples of the wave set in motion over one hundred and fifty years ago are still traveling outward, instigating counter-reactions and further elaborations across all spheres of human life.

Although the idea of evolution and the specific theory created by Darwin to account for the evolutionary process focuses upon natural and human history, its implications for the future are highly significant. As noted earlier, understanding history helps us to understand the future. Darwin, in fact, along with many other writers and scientists interested in evolution, drew a variety of conclusions concerning the future based on evolutionary ideas. What Darwin did was to identify a pattern to change in the flow of natural time and explain the natural causes of this temporal pattern. Evolution enriched and transformed the nature of

historical consciousness and future consciousness. I examine in this section some of the more noteworthy evolutionary ideas on the nature of change and the future.

To set the stage, the modern story of evolution begins in the writings of two seventeenth-century writers, John Ray (1627 – 1705) and Thomas Burnet (1635 – 1715), who attempted to combine and synthesize the new ideas and methods of science with Christian doctrine regarding the history and nature of life and the planet Earth.

In *The Wisdom of God Manifested in the Works of Creation* (1691) Ray systematically describes in great detail a static vision of nature, covering life, the earth, and the heavens above. He assumed, as did most other writers of his time, that the forms of nature, from living species to planets, had been designed and created by God and, further, that the forms of nature had not changed since the original creation. Ray viewed the heavens and the earth as existing in a state of harmony providing stability and support for the existence of life, in particular human life. The heavens and the earth were created for us by God. The constancy of nature reflects the perfection inherent in God's creation. Perfection also shows up in the harmonious relationship of life and physical nature. Each form of life is uniquely adapted and fitted to its surroundings.

Ray was inspired by Newton and the promise of science. Newton had demonstrated that physical nature was governed by a set of scientific laws which gave nature a regularity and uniformity within all its processes. Ray applied this vision to all the diverse forms of nature. He believed that constant and pervasive laws governed biological and physical reality. But he also believed, like Newton, that these laws of nature had been created by God for a purpose. The stability and harmony of nature existed to support the existence of humans. Hence, Ray combined, as did Newton, a mechanistic view of nature where laws determine the processes within nature, with a teleological theory that implied that all these deterministic laws were created for a purpose. Like Newton, he saw no incompatibility or contradiction between these two views of reality, mechanistic and scientific and teleological and religious. Ray supported "experimental philosophy" and the scientific search for knowledge and saw himself, in this regard, as serving the will of God.¹⁶⁸

Thomas Burnet also wrote on a large scale; his four-volume *The Sacred History of the Earth*, published during the 1680's, covered the entire past history of the earth as well as its predicted future leading to the end of time. Burnet, like Ray, attempted to integrate Biblical ideas regarding creation with Newtonian science and saw absolutely no contradiction between science and Christian religion. As did Newton and Ray, Burnet believed that the universe and the Earth had been created by God; (all three rejected the possibility that the universe and the earth were eternal). Burnet also thought that although the Earth and the heavens were shaped out of a primordial chaos by God, the Earth was initially created in a state of perfection and that, following Newton, God had also established the laws of nature at the beginning.

But given these basic assumptions and starting points, Burnet goes in a different direction than Ray. Burnet describes a transformative history for the

Earth; according to Burnet, the Earth has not been always the same. Burnet describes the Earth in the beginning as existing in a state of perfection – a paradise which contains the Garden of Eden and its original sole human inhabitants, Adam and Eve. Yet due to the repeated sins of humanity throughout early history, as well as the pre-ordained plans of God, Burnet contends, following the storyline in the Old Testament, that the Earth was subjected to a great flood or deluge which transformed its original perfection into the ragged, cavernous, and mountainous disarray of continents and islands existing in the present day. For Burnet, the Earth is now a “cracked ruin” – a poor resemblance to its initial perfect state. In essence, Burnet invokes the *Bible*, with its ideas on human sin and disobedience and the great flood, to explain contemporary geography.

Burnet, like most Christians of his time, believed in the literal truth of the *Bible*, which included the story of the flood and Noah’s ark. Burnet also believed, based on the famous calculation of Bishop Usher (using personal chronologies described in the Old Testament), that the Earth was approximately only six thousand years old. His future predictions of the Earth also derived from the *Bible*. He foresaw a coming conflagration that would return the Earth to a state of perfection and paradise where Christ would rule over the earth as prophesized in the *Bible*. In this regard, note the similarities with St. Augustine, as well as with Christian millennialism.

In this comprehensive description of past and future, Burnet combines linear and cyclic conceptions of time. Although there is a history to the Earth, involving change and a direction to the change, there is also a cycle to the entire process. The Earth begins in perfection, degenerates through destruction, and then once again rises to perfection in the end. The paradise and state of perfection at the end of time though is different than at the beginning. A story and narrative has unfolded – mankind falls but is redeemed and Christ rules over the Earth in the grand conclusion and finale of history. Geology is clearly mixed together with theology.

Although Burnet sees a restoration of perfection in the future – an optimistic vision regarding where we are heading – he attributes this restoration to the will of God. When Burnet looks at nature as such, he sees everything as decaying and wearing down. There is no intrinsic restorative power in nature – it is only God who creates or restores order according to Burnet. Yet because he also attempts to follow Newton and the new principles of science, Burnet thinks that the laws of nature directly determine the course of events within the world. Burnet combines God and the laws of nature by arguing that God created the laws such that these laws will produce the very historical changes intended by God and described in the *Bible*. The laws of nature – created by God – produce historical change and lead to both the deluge and decay and the eventual restoration to perfection. Again, as with Ray, there is an attempt to combine teleological and mechanistic views of change and find a way to reconcile the idea that God directs history with the scientific idea that the laws of nature determine history.¹⁶⁹ These efforts to combine science and religion on the part of Burnet and Ray are representative of popular thinking during their time and even into the

following century. According to Watson, up to the end of the eighteenth century, the main concern of geologists and other investigators of natural history was to find ways to reconcile the *Bible*, and in particular the book of *Genesis*, with the findings of geological and natural science.¹⁷⁰

In the writings of Ray and Burnet, the stage is set for the ongoing tension and struggle that shows up throughout the historical development of evolutionary thought over the next two centuries. Writers and researchers repeatedly attempted to find ways to make the accumulating scientific evidence consistent with the Biblical story of creation and, in general, make scientific ideas consistent with religious ideas, but the evidence would not fit and piece by piece the Biblical and religious ideas lost credibility and were replaced by a new way of thinking. This shift in thinking, as noted above, was the result of numerous discoveries and new ideas contributed by many individuals before Darwin. Darwin did not overturn the Biblical story of creation, many people did, and it was not that most of these researchers and writers did not want to preserve the Biblical story – far from it – they kept trying to preserve whatever elements of it they could, but the evidence just kept forcing them further and further away from the Biblical view.

A case in point is the issue of fossils. The famous scientist Robert Hooke (1635 – 1703), a contemporary and rival of Isaac Newton, argued that fossil bones of animals that no longer seemed to exist in the modern world appeared to indicate that once there had lived animals on the earth that had since become extinct. Hooke's hypothesis though was rejected by most early scientists, since it seemed to contradict the Biblical story that God had made all the various life forms at the beginning of creation and that since then, there had not been any significant change. Noah presumably did take two members of every species on the arc. The idea of extinction ran against the popular view that God's initial creation was perfect – if it was, then why would some species go extinct? It was not until a hundred years after Hooke had proposed his ideas on extinction that popular opinion began to shift. So many different fossil skeletons had been uncovered by then that did not match any existing animal species that it seemed increasingly irrational to deny the evidence.¹⁷¹

If evidence grew in the eighteenth and nineteenth centuries for biological change on the earth, what new facts and ideas emerged during this period regarding change in the heavens above? To recall, Plato viewed the heavens as both perfect and stable, and Christianity inherited this notion of a stable and harmonious heaven. Galileo found himself in trouble with the church in arguing that the heavens were neither perfect nor stable. To recall, Descartes hypothesized that the universe had evolved through the interaction of physical forces and Leibniz also believed in cosmic evolution (as well as biological extinction and evolution), but the Platonic-Christian view of a stable perfect heaven, supported by Newton's idea of stable laws and a static universe, was the dominant view through the seventeenth and early eighteenth centuries. But following the lead of Galileo, the astronomer William Herschel (1738 – 1822) (the discoverer of the planet Uranus) began to accumulate mounting evidence, based on improved telescopic devices, that there were fundamental changes occurring in the heavens. Through detailed observations of stars and gaseous nebulae

throughout the sky, Herschel hypothesized that the stars were not static or permanent but rather formed out of nebulae. Creation was not something that happened once and for all at the beginning of time, but was ongoing. As with Galileo, who first saw the craters of our moon and observed the moons of Saturn and Jupiter revolving around these giant planets, improved observations and astronomical technology led to a change in thinking from a stable heaven to a changing one.¹⁷²

Midway through the eighteenth century, the general theory of cosmic evolution reasserted itself in the writings of Immanuel Kant. In his book *Universal Natural History and Theory of the Heavens*, Kant argued in a vein similar to Descartes and Leibniz that evolution was a general process occurring through the universe. Kant believed that through the influence of the laws of nature, order and structure emerged out of amorphous and chaotic beginnings. Kant saw his explanation of cosmic order as following from Newtonian ideas, specifically invoking natural laws to explain natural phenomena, but Kant's vision of the heavens was decidedly anti-Newtonian in describing the cosmos as dynamical and evolutionary, rather than static and stable. Yet, Kant still wanted to preserve a place for God and argued that the evolutionary and creative effect of natural laws was evidence for a divine intelligence behind the creation of these natural laws.¹⁷³ Kant saw cosmic evolution, as well as social historical evolution, as teleological, being guided by the plans and purposes of God.¹⁷⁴ Thus Kant typifies a common view that would appear and reappear over the next centuries. Argue for the reality of evolution and the determinism of natural laws, but assume that the laws of nature were created by God and the resultant evolutionary process was God's intention – evolution is the mechanism of God's creation.

The mathematician Pierre-Simon LaPlace (1749 – 1827) however, found no evidence of God within the emerging sciences of astronomy and astrophysics. LaPlace adopted Herschel's idea of "nebular condensation" to explain the formation of the solar system and, in general, saw the heavens as undergoing change due to the inherent forces and laws of nature. To recall, LaPlace supported the philosophy of determinism, arguing that given complete and detailed knowledge of the universe, it would be possible, in principle, to predict the entire future history of the cosmos. LaPlace believed that natural events followed from natural laws and could see no convincing reason to add any additional factors (e.g., the intentions of God) into the picture if the laws of nature provided a complete explanation. He argued, "If we trace the history of progress of the human mind, and of its errors, we shall observe final causes perpetually receding, according as the boundaries of our knowledge are extended."¹⁷⁵ Final causes, which are central to teleological explanations, would include divine purposes or intentions behind the processes of nature. LaPlace saw final causes as unnecessary and a sign of ignorance. Before natural laws were identified, primitive humans explained natural occurrences as due to the intentions and actions of deities, but what explanatory function do such deistic beliefs serve if the processes of nature can be completely predicted from natural laws? Hence, in finding natural laws which explain the processes of nature, it seems gratuitous and unnecessary to continue to include God in the equations.

Thus we see in LaPlace the recognition that if natural laws completely explain natural phenomena, then spiritual and religious ideas about nature serve no function. Instead of trying to combine the scientific and the religious, LaPlace jettisons the religious since it seems superfluous. This realization repeatedly occurs in researchers and scientists in the coming century, as more and more of nature became intelligible through natural laws. Repeatedly, in one case after another, the need to postulate a teleological or supernatural force behind some natural phenomenon seemed unnecessary. When Darwin addressed the origin of species, he was able to provide an explanation in terms of natural law that seemed to make the idea of a supernatural creator superfluous.

If change became an increasingly obvious fact regarding the heavens, a similar realization steadily emerged regarding the Earth and the history of humankind. Although, as described earlier, pre-modern humanity was not totally oblivious to historical change, the depth, richness, and scope of humanity's understanding of the past were significantly limited. Furthermore, the Biblical account of creation, as noted above, was interpreted to mean that the variety of species had been fixed at creation. Also, based on the famous calculation of Bishop Usher (1581-1656), who argued that the earth was created in 4004 BC, most Western Christians believed that the world was relatively young and that humankind had been around since the original creation. Historical and scientific research beginning in the eighteenth century would drastically expand and alter these ancient and traditional views.

Understanding the modern development of the study of history is highly relevant to understanding the theory of evolution, for as the biologist Kenneth Miller points out, evolution, in fact, is a theory and description of history.¹⁷⁶ As the study of natural and cultural history developed in modern times an immense amount of evidence began to accumulate regarding the richness and vast reaches of the past. Relics, fossils, and other records and effects of the past have over the last few centuries steadily been unearthed, filling in more details and progressively revealing earlier and earlier beginnings for both natural and cultural phenomenon.¹⁷⁷ One of the great achievements of modern times is the discovery and dramatically heightened awareness of the vast legacy of the past and the breadth and depth of historical change. Temporal consciousness has jumped forward in the last few centuries.¹⁷⁸ The increasing sense of historical change and all the various forms of evidence supporting this enhanced understanding of the past provided Darwin with a foundation on which to build his theory of evolution. Evolution provided a systematic description and explanation for biological change that was connected to and grounded upon the emerging historical story of natural change.

Critical to the foundation for the theory of evolution was the discovery of “**deep time.**” James Hutton (1726 – 1797), who is frequently identified as the father of modern scientific geology, published in 1795 his famous work *Theory of the Earth*, “the earliest treatise which can be considered a geological synthesis rather than an imaginative exercise,” and described in this book a vision of the history of the earth that extended back in time indefinitely for millions upon millions of years. It is important to note that at the time Hutton published this

book, the historical accuracy of the Great Flood as well as the entire story of creation as described in *Genesis* was not questioned. Yet Hutton's ideas would challenge all of this. He is famous for the statement describing the vast panorama of earthly time, "...we find no vestige of a beginning, - no prospect of an end." According to Hutton, the earth was very old – much older than most everyone had supposed.¹⁷⁹

Through a detailed examination of geological strata and forms of deposits around the world, Hutton provided a scientific explanation for how the surface of the earth was transformed over time. He argued that geological change involved two complimentary processes, destructive deterioration and creative restoration. (Note the age old theme of creation and destruction in explaining change.) Contrary to the idea found in Burnet, that nature left to itself deteriorates over time, Hutton presented a great deal of evidence that nature also rebuilds and that new geological structures emerge while older ones wear away. Likening his model of the Earth to the Newtonian idea of nature as a perfect machine, Hutton viewed earthly time as an endless cycle of creation and decay – of becoming and passing away.

Hutton described this cyclical process entirely in terms of natural forces, without invoking any divine guidance or intervention – as had Burnet – and found such natural forces as sufficient to explain the present geological conditions of the Earth. Further, he contended that all these natural forces that existed throughout the history of the earth were the same forces we see at work in the world today. There was nothing unusual or miraculous about change in the past – the laws and forces of nature at work on the earth are constant and uniform through time. Thus Hutton's position is seen as a supreme example of the general theory of **uniformitarianism**. The Biblical view of the past invoked unique and catastrophic events, such as the flood, in describing the history of the Earth as well as the cosmos and, during Hutton's time, this perspective on history was identified as **catastrophism**. Hutton rejected catastrophism because he believed that natural change was due to uniform and constant natural forces – in the spirit of Newtonian science which described natural change as due to universal and constant laws.

Because Hutton supported a cyclical theory of time regarding the history of the Earth, he saw the earth as a stable system. Though there is constant change, the changes balance out and, to use modern scientific terminology, the earth exists in a state of "dynamic equilibrium," stability being maintained through balanced and cyclic oppositional processes. Further, Hutton saw life and the natural world as existing in a state of harmony with each other. Life fits the environment and the environment fits life – there is a complementarity here as well. Thus we have a perfect system, dynamical yet stable, where forces balance and all the parts fit together into a harmonious whole.

Because Hutton basically argued that regarding the earth, there is "nothing new under the sun," Stephen Jay Gould contends that Hutton had no real conception of history. What exists today is what existed in the past – there is no real change. So it is rather ironical that the man who opened up the vastness of time on the earth – who "discovered" deep time – ended up rejecting the idea

that there had been any significant changes across the wide expanse of historical time. This extreme uniformitarianism regarding the past would, however, dramatically change in the century ahead.¹⁸⁰

It is important to see the relevance of Hutton's ideas to both the theory of evolution as well as to our thinking about the future. Hutton transformed our understanding of time – time was vast and the events in time could be accounted for through natural law and natural forces. Just as the past extends backwards much further than previously supposed, the future stretches out ahead of us “with no prospect of an end.” Just as science was demonstrating that the natural world as observed in the present could be explained through natural laws and natural forces, Hutton proposed that both the past and the future could be understood in a similar fashion. Further, the state of the present could be explained in terms of forces at work throughout the past. What Hutton provided for evolutionary theorists, including Darwin, was a much expanded panorama of time in which natural forces could produce fundamental change in the world. Again, with a degree of irony, though Hutton saw the forms and forces of nature as uniform across time, it was his discovery of deep time that opened the possibility that given a sufficient amount of time big changes could occur in the biological realm.

Because Hutton adopted a cyclical vision of earthly time with no real historical change, within the confines of this model there is no explanation of origins or beginnings. Extending backwards into the past, the world simply exists just as it does today. But how did this world and the natural laws that govern it come into existence? Or are the world and its laws eternal? And how does Hutton account for the perfect harmony between life and the natural world? On these questions, in spite of Hutton's efforts to be scientific and empirical regarding the study of the earth, he ultimately resorts to a supernatural or divine explanation for the origin of the earth and the harmony of nature. So although Hutton does attempt to provide a naturalistic explanation for geological structures and geological processes, he does not extend this naturalistic perspective to explaining how the forms or laws of nature came about. In this regard, he ends up with a view similar to Newton's; natural laws explain how the world operates and how it is ordered, but God is invoked to explain the origin and formation of nature. Both Hutton and Newton lived in a divinely created static world.

Though Hutton believed in a stable albeit dynamic and cyclic Earth, the accumulating number of animal and plant fossils seemed to imply something different, at least regarding the history of life. To set the stage for the transformation in thinking that occurred surrounding the meaning of fossils, let us begin with Carolus Linnaeus (1707 – 1778) who founded the modern system of biological classification. Linnaeus believed that there existed a natural order and arrangement of living species. He extensively studied the distinctive anatomical features of living forms and attempted to arrange and classify living forms based on observable similarities and differences. But like other early scientists, Linnaeus combined the methods of science with religious concepts as well. For Linnaeus, each species was a distinct and stable entity created by God at the beginning of time. Again noting the adaptive fit of living forms to their environment, Linnaeus invoked God to explain this harmony and concordance.

Yet, Linnaeus was aware of the growing collection of fossils that seemed to be of species that no longer existed on the earth, but he had no clear way to account for their existence that did not upset his vision of a stable and perfect set of living forms created by God.

One particular point regarding the classification system created by Linnaeus that would open a Pandora's box in the century ahead was that he grouped humanity together with the apes as a common biological group. According to Linnaeus, no anatomical distinctive feature could be found that clearly separated humans from apes. In his time, this point created a controversy, since the common opinion in the West was that humanity was special and clearly distinct from the rest of the animal kingdom. What would be eventually suggested, because of this anatomical affinity of human and apes, was that somehow humans and apes were biologically related.¹⁸¹

Linnaeus's contemporary Comte de Buffon (1707 – 1788) thought differently about both fossils and the relationship among the various living species. Buffon believed, just as had Hooke a century before, that fossils were evidence for extinction; thus the perfect order of living forms was not so perfect. Further, Buffon took a naturalist point of view regarding history and believed that natural forces, uniform throughout time, produced any changes that had occurred throughout history. Hence, Buffon thought that the extinction of living forms throughout history was due to natural forces. This idea would be adopted by Darwin a century later. In presenting this argument, Buffon distinguishes between the idea of uniformitarianism, which is that the same laws and forces have been in operation throughout the history of the earth, and the idea that there have been no significant changes in natural, and in particular, biological forms throughout history. Buffon accepted the first idea, but not the second one. In his mind, contrary to Hutton's uniformitarianism, constant laws and forces can, over time, produce changes in the specific forms that populated the natural and biological world. This is a critical insight, also central to Darwin's theory of evolution.

Buffon also anticipated Darwin on the cause of extinction. Specifically, Buffon saw the natural world as undergoing changes through time, and hypothesized that different forms of life may have become extinct because they could not survive within changing environmental conditions. Buffon not only acknowledged the reality of biological extinction, he also entertained the possibility that new forms of life could arise within nature as well.

Contrary to Linnaeus, Buffon did not see the biological world as a set of clearly distinct and separate species, but rather as one great whole where differences among living forms involved variations and gradations rather than clearly distinct and separate groups. In Buffon's mind all of life was connected and across the vast domain of living forms there were innumerable commonalities of structure and function. Life does not appear to be a set of separately created forms, but a huge family of interrelated beings. Again, this idea anticipates Darwin and the evolutionary view that living forms are all connected via common descent. Buffon did not propose a theory of evolution – for one thing he was not aware of the vast stretch of deep time that Hutton was to

uncover in the decades ahead – but Buffon did grasp the notion of biological change and biological interconnectedness, two key elements in Darwin’s theory.¹⁸²

The founder of modern paleontology, Georges Cuvier (1769 – 1832), extensively studied, catalogued, and classified existing fossils, including recently uncovered mastodon and mammoth skeletons. Based on the pervasive fossil evidence that had accumulated by the late eighteenth century, Cuvier championed the idea that there had been significant mass extinctions in the past. Cuvier had a powerful influence on the scientific community because of the large amount of evidence and detailed analysis he presented on fossil remains. After Cuvier it no longer seemed realistic to deny extinction as a fundamental feature within the natural history of the past.

Cuvier believed that the scientific evidence pointed to a series of pervasive or “catastrophic” upheavals in both biological and geological history. He opposed the uniformitarianism doctrine that natural change in the past had been slow and steady. Catastrophic geological changes produced mass extinctions of innumerable life forms which according to Cuvier, were followed by creative outbursts of new life forms. To some degree, more recent geological and fossil evidence has supported Cuvier’s theory of catastrophism, at least in so far as there is strong evidence for mass biological extinctions coupled together with significant geological and meteorological changes. Cuvier, though, believed that the creation of new life forms was connected with the hand of God and not due to naturalistic forces, and he did not think that new life forms evolved from earlier life forms.¹⁸³

One important discovery during the time of Cuvier that was crucial in understanding the history of the earth was made by the British “surveyor and self-made engineer,” William Smith (1769 – 1839). What Smith realized in his examination of geological strata was that different strata were associated with distinctive sets of different biological fossils. Each geological layer or strata, as a record of the history of the earth, was uniquely connected with a biological record of past living forms. Paleontology and historical geology come together in a unified image of the past. Cuvier was aware of this highly significant connection between geological and biological records of the past in formulating his views on the history of the earth.¹⁸⁴

Another significant development that contributed to the new way of thinking about history and time was the scientific work going on in archeology and cultural history. The Biblical account of creation fitted together explanations of the origin of the physical universe, biology, and the history of humankind. Just as investigations in geology and paleontology were unsettling Biblical views on the history of the physical and biological realms, the scientific study of human history was producing some challenging facts and conclusions as well. By the early decades of the eighteenth century, archeology had unearthed ancient relics and repositories of long vanished cities and cultures that seemed to indicate a longer, more ancient history for humanity than what was described in the *Bible*. Additionally, there appeared to be important pieces missing, as indicated by archeological findings, in the Biblical telling of human history. In fact, these

scientific and historical investigations instigated a rise in Biblical criticism regarding the accuracy of the *Bible* as a record of the past. Moreover, for centuries many people had been aware of primitive stone tools that had been uncovered throughout Europe which seemed to have been made by humans from some much earlier era. As the study and collection of these fossil tools advanced, it became apparent that they showed a developmental progression in style and sophistication. There were some writers who suggested that there had been humans prior to Adam and, based on the evidence and following an “evolutionary” logic, argued that humankind had progressed from exceedingly primitive beginnings to our present civilized state. Hence, while geology and paleontology were creating a history of nature that appeared to contradict Biblical accounts – especially in terms of the deep expanse of time in the past – archeology was putting together a history of humanity that also challenged the *Bible* and again seemed to require a much more expanded view of the past. Further, these new views of geology, life, and the history of humanity seemed to fit together into a coherent whole. A new story of history was emerging.¹⁸⁵

Moving on to the next important individual in this history of evolutionary thought, Jean de Lamarck (1744 – 1829) is frequently identified as the person who proposed a mistaken and scientifically untenable theory of evolution based on the idea that offspring inherit the “acquired characteristics” of their parents. For example, if parents exercise their physical bodies and increase their muscular strength through this process, Lamarck believed that this acquired increased muscular strength would be passed on to their offspring. This idea of inherited acquired characteristics runs counter to modern genetic theory – according to contemporary scientific thinking, the experiences and activities of parents do not affect the genes that they pass on to their offspring. Lamarck had no conception or knowledge of the nature and operation of genes and the role of genetics in evolution.

Although Lamarck’s theory of evolution through acquired characteristics was generally rejected by the scientific community in the decades to come, it was Lamarck who first proposed a comprehensive theory of how the evolution of all of life from simple beginnings could have occurred through entirely natural forces. Lamarck may have been wrong regarding the mechanism that produced evolution, but he clearly articulated a general description of evolution and provided the first naturalistic explanation of how it happened. This is a highly significant shift in thinking, for almost all modern scientific writers prior to Lamarck invoked some type of divine or supernatural force in explaining some aspect of life and natural change.

A fundamental assumption in Lamarck’s theory of evolution is that he saw species as transformative rather than static or stable. For Lamarck, the fossil evidence seemed to indicate that the forms of life had changed throughout history. Species are mutable. It is only from our very limited time perspective that life and the environment seem stable, but the geological and fossil evidence tells a different story. Life is adapted to the environment and will remain stable if the environment remains stable, but the environment is not always stable. If the environment undergoes change, life will change with it.

Lamarck believed that present life forms evolved from earlier life forms and that there was a general overall direction in nature from simpler life forms to more complex, organized, and intelligent life forms. When the environment undergoes changes, life is challenged to adapt to these changes, and living forms extend their capacities and abilities in order to continue to exist. The results of such adaptive efforts get passed on to offspring. This theory of adaptive evolution through acquired characteristics was applied by Lamarck to humans as well. He argued that humans arose out of apes – apes that were pushed into having to expand their intelligence in order to continue to survive.

The idea that there is a direction to change is basic to Christian and other teleological views of time – the direction is set by God and determined by God's purpose. Yet, Lamarck excludes God from his theory of biological evolution and attempts to explain evolution in purely naturalistic terms. Evolution is due to ongoing adaptation. He still believes, however, that there is a direction to evolution – a direction that results from the forces of nature. To recall, supporters of the idea of progress, such as Spencer, Marx, and Comte, believed that there was a direction to history that could be understood and explained through natural, as opposed to supernatural, forces. Yet in the decades ahead, as evolution became the accepted explanation of biological change, the debate would arise over whether there was a progressive direction to evolution. Lamarck believed that there was such a natural direction to evolution, a progressive direction defined in terms of increasing complexity and intelligence. He believed that increasing complexity and intelligence was a result of having to adapt to a changing environment. But adaptive success may not imply increasing complexity – there are innumerable simple organisms that are adaptively very successful, having existed for millions of years. How is humanity somehow more adaptively successful than bacteria, sharks, or crocodiles? Is there a direction to evolution and is this direction somehow progressive? Can we understand the idea of progress in nature without the idea of God? These questions would be discussed and debated in the centuries ahead.¹⁸⁶

Charles Darwin was aware of Lamarck's theory of evolution, as well as similar evolutionary speculations published by his grandfather Erasmus Darwin (1731 – 1802). Indeed, by the 1830's most stratigraphers believed that the fossil record showed improvement or progress in living forms across the different geological strata. They recognized that fossils of increasingly complex organisms appear as we move from older to more recent geological strata. In the 1840's the three great periods of geological history, Paleozoic, Mesozoic, and Cenozoic had been named and identified, each successive period corresponding to the emergence and flourishing of, respectively, fish and invertebrates, reptiles, and finally mammals. Further, the ideas of struggle, competition, biological divergence, and even evolution were "in the air," as topics of discussion and debate. In general, evolution had become a popular idea before Darwin created his theory of how evolution took place.¹⁸⁷ Two writers though would provide the final critical inspiration for Darwin.

Thomas Malthus (1766 – 1834) in *An Essay on the Principle of Population* (1798) argued that species populations left unchecked always increase

geometrically, whereas available food supplies do not show a corresponding increase. Hence, the number of members of a species is always kept in check because there is not enough food to go around to feed a geometrically increasing population. Many members of each generation starve to death. The implication of Malthus's thesis is that there is ongoing competition in each generation for food and other necessary resources. This implication of a necessary element of competition in nature would provide one of the essential components to Darwin's theory of natural selection. Darwin, in fact, credited Malthus with providing the key inspirational element in formulating his theory of evolution.¹⁸⁸

The second person who strongly impacted Darwin's thinking was Charles Lyell (1797 – 1875) the founder of modern geology. In his *Principles of Geology* (1830-1833) Lyell adopted and defended Hutton's theory of uniformitarianism and added new evidence and arguments to the idea that the constant and moderate forces of nature had produced all geological change throughout history. Lyell opposed catastrophism and was highly critical of Lamarck's theory of evolution. Contrary to the popular view of the day, Lyell saw no direction toward improvement in the fossil evidence. Instead he believed that each geological epoch brought with it a set of living forms specifically created and adapted to their particular environment. According to Lyell, natural history was cyclical and there was no overall direction across cycles.

What Darwin got from Lyell was a powerful sense of the vastness of natural history and the belief that constant and moderate natural forces, given sufficient time, could produce significant effects. Like Lyell, he accepted uniformitarianism. Darwin also found in Lyell a friend and intellectual colleague who provided a critical ear for his ideas. Lyell and Darwin corresponded extensively as Darwin was writing *The Origin of Species*. Yet, even after the publication of the ground-breaking work, Lyell remained unconvinced of either evolution or Darwin's explanation in terms of natural selection. While Lyell eventually did accept evolution, but he did not believe that natural selection could explain the emergence of new species.¹⁸⁹

Gould argues that Lyell conflated and confused the different meanings of uniformitarianism. Like Hutton, Lyell believed that the laws of nature were constant through history and that such laws were sufficient to explain geological change. But Lyell inferred from this premise of constancy of laws that the conditions of the earth did not dramatically change throughout history (history was cyclical) and that the rate of change was constant throughout history. Lyell associated catastrophism – abrupt and significant change – with teleological and Biblical thinking about history, but as Gould correctly points out, catastrophic change need not have supernatural causes. The collision of a meteor or comet with the earth, which presumably occurred coincident with the extinction of the dinosaurs, was a natural event that produced fundamental and pervasive ecological changes. Lyell believed that the fossil record, which seemed to indicate abrupt and pronounced changes in biological populations, reflected incomplete evidence and that with accumulating evidence the suggestion of sudden big changes would disappear. Darwin also took this the position that there were no catastrophic changes in ecosystems, an idea that came to be

referred to as gradualism. But Lyell also believed that if there were uniform laws at work, then there couldn't be any pronounced and directional changes across even larger periods of time.¹⁹⁰ Darwin did not accept this meaning of uniformitarianism; constant laws producing gradual changes, in Darwin's mind, could produce big changes over sufficient time. The question for Darwin was how.

Darwin's theory of evolution through natural selection is the essence of simplicity. Thomas Huxley, perhaps Darwin's strongest advocate, remarked that when he read Darwin's explanation of evolution it struck him how obvious the explanation was and Huxley wondered why he hadn't thought of it himself. Yet, even if the theory is simple, the implications of the theory are enormous. There have been numerous and varied interpretations of the meaning and significance of Darwin's theory.

As the historian of science, John Green, notes in *The Death of Adam*, all the elements of Darwin's theory were in place by 1818. Evolution had emerged as a popular scientific idea in both astronomy/cosmology and paleontology. Hutton had demonstrated that the earth was very old – much older than previously supposed – and that natural laws could account for present geological conditions. Cuvier had clearly demonstrated the factual reality of extinction and provided the methodological principles for reading the fossil record. Buffon and others had noted the ongoing variability in species, as well as suggesting that extinction may be a result of the ongoing struggle for survival. Finally, Malthus had shown that reproduction rates invariably exceed the resources needed for survival. The idea had even been suggested that natural selection of more favorable variations could be used to explain the evolution of the different races of humanity.¹⁹¹ As noted earlier, what Darwin accomplished was putting together the accumulated pieces of research and theory produced by others. Darwin found the key to creating his theoretical synthesis in the idea of natural selection.

Darwin's argument is that life forms exhibit variation (perhaps random variation) in offspring produced in each generation; that given the limited food and resources in the environment too many offspring are produced for all to survive; and therefore there is natural competition over resources among the members of a species. Because there is variability among the species, some members will possess greater abilities for finding resources and staying alive. Those members possessing these favorable traits will survive and pass on those favorable traits or abilities to their offspring. Favorable traits steadily accrue and magnify over successive generations due to the ongoing process of natural selection of those members of a species better able to survive. Given sufficient time this ongoing selective process produces the evolution of new species and eliminates various species that are not able survive.¹⁹²

As the noted philosopher and social thinker George Herbert Mead (1863 – 1931) pointed out, what Darwin provided in his theory of evolution was a general explanation, in terms of a fundamental natural law, for the great variety of different existing species. Species or biological forms were not created individually (for example, by God), but rather a universal and ubiquitous principle was responsible for all species. Form was not assumed as a given, but rather,

form was the result of a dynamical process in nature. In essence, instead of simply stating that God made the forms of nature (without any further explication) or that forms are eternal (as in Plato), Darwin argued that at least biological forms had evolved, and he provided a real, understandable explanation for how this happens.¹⁹³

The argument is often made that Darwin's theory implies that evolution occurs by chance. Such an interpretation of Darwin is at best a half-truth and it is exceedingly misleading. As just noted, Darwin provided an explanation of evolution through natural law – the antithesis of randomness or chance. It is true that reproductive variation may be random or due to chance, but the law of natural selection goes to work on these variations, perpetuating those members of a species that are most adaptive or capable in the environment. The conditions of the environment are clearly not random and ultimately it is the resources, opportunities, and dangers of the structured environment that select which members of a species survive. The more accurate and complete description of Darwin's theory of natural selection is that it combines chance and natural law providing an alternative explanation for species to that of divine creation.¹⁹⁴

Clearly Darwin saw order and lawfulness in the evolution of life; what Darwin did not see was purpose or intelligent design. Evolution occurs through natural selection and there is no overall purposeful direction to this process; there is no need to postulate a guiding force or intelligence behind the process. There is no plan or goal to the evolution of life – natural selection explains why life evolves.¹⁹⁵ Natural selection also explains why living forms seem so well adapted to their environment – if a living form is maladapted, it dies, and due to the ongoing competition among members of a species, only those most capable pass on their traits through inheritance. Adaptation or the harmonious relation of life to the environment is selected for. There is no need to postulate an intelligent or purposeful force that creates life forms that are fitted to the environment.

Darwin's abandonment of purposeful design or direction in his theory instigated a great deal of controversy. As described in this history of evolutionary thought, most scientists and philosophers prior to Darwin accepted the Christian idea that there was purpose and intelligence behind both creation and natural change. It seemed to Darwin's critics that his theory of evolution made God unnecessary. Also in jettisoning the idea of purposeful direction, the future no longer seemed certain or secure. The future, within a Darwinian universe, was not being directed or guided toward some divinely determined end. Critics of Darwin found this loss of purposeful and divine direction to time abhorrent and totally disconcerting. What was the point – what was the meaning of it all, if there was no divine purpose guiding natural change?

Though Darwin was a scientist in the tradition of Newton, believing that there were natural laws to explain the order and processes of nature, Darwin's theory of evolution constitutes a real break with one fundamental assumption in Newtonian science. Newton believed that order was imposed on nature, directly through the laws of nature but ultimately through the hand of God who created the laws. Newtonian science is "top-down" – order comes from above and is

imposed on nature below. Darwin turns this view upside down. As noted above, biological forms are not given or created by God; the forms of life arise through natural forces, and in particular, natural selection. As Tanner Edis states "...Darwinian evolution...radically undermines the whole top-down universe, situating creativity squarely in the material world."¹⁹⁶ For Darwin, biological order arises from the bottom-up. In essence, Darwin abandons the idea that order in nature requires an intelligent higher form producing that order. This bottom – up evolutionary perspective would permeate out through much of modern science in the coming century.

Another way to state this last point is that Darwin attempted to explain the complexity and organization of the natural world without assuming that something just as complex already exists which gave the world its complexity and organization. For Darwin, complexity arises in life from simple beginnings; complexity is not imposed on life by a complex Creator. The direction in evolution is from the simple to the complex, and Darwin believed that he had discovered a naturalistic mechanism that would explain how something more complex could arise out of something simpler.

Although Darwin did not see purpose or intelligent design in the evolution of life, he did believe that evolution lead to improvement – that is he saw evolution as progressive. Accordingly, he believed that natural selection led to improvement or progress. As Nisbet points out, Darwin often used the words "progress" and "evolution" interchangeably. Darwin spoke of "higher" and "lower" life forms, equating lower with simpler, older, and more primitive species. Higher life forms were more complex, and hence, similar to Lamarck, Darwin used increasing complexity as a criterion for defining evolutionary progress. Darwin also saw in animal and human evolution both increasing intelligence and increasing moral capacity. He believed that the future would see humanity further evolving in both intelligence and morality. So although there was no apparent purposeful direction to the evolution of life, there seemed to be for Darwin a naturalistic direction to evolution – a direction that was progressive. This direction, though, emerged out of nature.¹⁹⁷

Another central point in Darwin's theory that would generate intense debate and controversy concerned the origin of humanity. Christianity saw humankind as a special creation of God. Humans were clearly different from animals, not only possessing rational intelligence and a moral sense, but also, according to Christianity, an immortal immaterial soul. It was evident to many of Darwin's critics, even with the publication of *On the Origin of Species*, in which Darwin does not directly address the issue, that the theory of evolution implied a totally different explanation of the origin of humans. Darwin removed all doubt concerning his view of humanity with the publication in 1871 of *The Descent of Man and Selection in Relation to Sex*. As he states in this book, "The main conclusion here arrived at, and now held by many naturalists who are well competent to form a sound judgment, is that man is descended from some less highly organised form." To recall, Lamarck had argued that humans were descended from apes, and there were many other scientists and philosophers, Darwin notes, who also held such a view. What Darwin provides in *The Descent*

of Man is an explanation of the origin and development of humanity in terms of his particular theory of evolution through natural selection.

From a Darwinian perspective, humanity is not distinct from the rest of life. Humanity is part of nature and is connected with the rest of life through common descent. Our ancestry can be traced back to the simplest of creatures that populated the world millions of years ago. Humanity shows great similarity and commonality with other species, and in particular primate and mammal species. Placing humankind within nature – rather than separate from nature – was a real blow to humanity’s ego and totally contradicted Christian doctrine regarding the special creation of Adam and Eve. Further, many Christians worried that if Darwin was right, then what happens to the idea of a human soul?¹⁹⁸

Darwin is particularly concerned in *The Descent of Man* to demonstrate that not only are there innumerable anatomical and physiological commonalities between humans and other life forms, but there are clear connections between humans and animals, especially higher animals, regarding intelligence and morality – two of the presumed distinguishing characteristics of humans. Darwin’s argument is that intelligence and morality evolved in degrees from lower animals up through higher animals and eventually humans. Adopting his “gradualist” position on evolution, he wanted to demonstrate that nothing “catastrophic” or special occurred in the emergence of humans. For Darwin the difference between humans and other animals, even regarding intellectual and moral abilities, is one of degree.

Further, following a line of thinking that in fact stretches all the way back to the ancient Greeks, but had become increasingly championed by various writers in his day, Darwin argued that humankind and human civilization gradually evolved from a state of primitive barbarism. Inspired by the study of apes and newly discovered primitive cultures around the world, a variety of scientists and scholars in the late eighteenth century, including Buffon, Jean Jacques Rosseau (1712 – 1778), Lord Monboddo (1714 – 1799), and Lamarck, all argued that human history should not be seen as a fall from perfection (the Garden of Eden or Golden Age myths), but rather as a rise from savagery. As I noted earlier, archeology had begun to uncover significant evidence that humankind had progressed from the primitive in the distant past to the more advanced over time. (The first Neanderthal skull was unearthed in 1856.¹⁹⁹) Darwin embraced this theory of cultural history but combined it with biological history and his theory of evolution into one grand scheme of human evolution. For Darwin, the entire bio-social history of humanity is one of steady progression upward from the simple and the primitive to the complex, intelligent, and increasingly civilized. Herbert Spencer, for one, who both influenced Darwin as well as being influenced by him, took a similar view, and saw cultural development as a continuation and further elaboration of biological evolution. For Darwin and Spencer, as well as many other scientists and philosophers of the day who were influenced by them, evolution became an all embracing theory which explained the entire history of humanity and provided a conceptual framework for understanding the future of humankind.²⁰⁰

The promise of science, from its beginnings in Galileo, Kepler, and Newton had been to explain all of nature in terms of natural laws. Yet, as I have described in my history of modern science, philosophy, and evolutionary thinking, God and various supernatural forces were often included in both theories of nature and theories of humanity. Even Descartes who championed the scientific method and argued for an evolutionary explanation of the development of the astronomical and stellar systems, believed that God had created the universe and that God had given humankind a special “immaterial” mind (or soul) that was exempt from the deterministic laws of nature. But the philosophical movement toward viewing everything in naturalistic and secular terms steadily gained strength throughout the eighteenth and nineteenth centuries, and with the publications of both *On the Origin of Species* and *The Descent of Man*, humankind was assimilated into the scientific and naturalistic model and the role of God was pushed further out of the picture. For writers such as Spencer, who embraced the idea of evolution, evolution provided a naturalistic concept that comprehensively explained the history and present conditions of all of nature, including humanity.

Eliminating divine purpose and special creation in the grand scheme of things dramatically altered how humanity viewed itself in the context of the cosmos. As Tarnas notes, humankind “...was not God’s noble creation with a divine destiny, but nature’s experiment with an uncertain destiny.” *Homo sapiens* are simply “a highly successful animal.” According to Tarnas, this insight was both liberating and alienating, for divine purpose gave humans a sense of meaning and security, as well as a yoke and constraint on behavior and thinking. Although evolution was embraced by philosophers of progress as a naturalistic justification and foundation for their belief in increasing improvement in humankind and human society, Tarnas argues that Darwin’s theory of evolution also undercut the optimism of the Enlightenment. Not only did the theory of evolution seem to imply that Christianity, as well as other religious doctrines, was nothing but an “anthropocentric delusion,” but given the dethronement of humanity from a special position within the cosmos, there was no longer any guarantee or promise for the indefinite success of the species. In the ongoing competitive reality of nature, who is to say if humankind will survive? No one is watching out for us. The future of humanity is uncertain. Further, culture and ethics can no longer be seen as having some higher, divine origin or justification – both civilization and morality are expressions of the evolutionary process, part of nature rather than being divinely ordained or created. Hence, the ideal future defined in terms of ethical standards is a creation of the human mind.²⁰¹

Tarnas’s interpretation of the effect of Darwinian thinking on humanity’s sense of purpose and direction brings us back to the issue of progress and how it connects with Darwin’s theory of evolution. The issue is complex and controversial. Tarnas argues that the theory of evolution through natural selection undermines both religious and secular ideas regarding the inevitable progress of humankind. Within a Darwinian context, there is no guarantee that humans will continue to progress, let alone survive. There is clearly no purpose or plan to evolution, thus undercutting teleological or religious ideas of progress, such as in

St. Augustine and later Christianity. Yet Darwin, as noted above, saw evolution through natural selection as leading to progress and improvement. I have already described earlier how nineteenth-century writers such as Marx, Comte, and Spencer all believed that there was a natural law of progress in human history, and with the emergence of Darwin's theory, many philosophers of progress, Spencer being one noteworthy example, embraced the evolutionary perspective as providing a scientific explanation and grounding for the reality and inevitability of progress. This coupling of the ideas of progress and evolution became known as "**Social Darwinism**" – a very powerful intellectual force in the late nineteenth and early twentieth centuries. But Social Darwinism has been criticized on both logical and moral grounds.²⁰²

Let us try to disentangle and clarify the connection between evolution and the theory of progress. First, it should be noted that both Judeo-Christian and modern secular theories of progress adopted a linear and progressive view of time. Darwin's theory of evolution through natural selection also presented a linear and progressive view of time, at least in so far as Darwin believed that evolution led to increasing complexity and intelligence in the biological realm. The difference among these three views is that the Judeo-Christian vision of the world is teleological and supernaturally directed, whereas the secular theory of progress and Darwin's theory of evolution do not postulate any supernatural force producing and guiding progress.

Second, when Darwin first published *On the Origin of Species* he clearly appeared to be arguing that competition among members of a species led to evolution. Since by implication it was those members of a species best adapted to the environment that survived and reproduced, Spencer suggested the phrase "survival of the fittest" to concisely describe the Darwinian principle of natural selection and Darwin in later editions of *On the Origin of Species* included this phrase to describe his theory. Philosophers of progress, such as Spencer, viewed this competitive reading of Darwin as a justification for the economic and social reality of competitiveness in the modern European world. To recall, Adam Smith had made the idea of competition central to his economic theory of capitalism. Hence, defenders of capitalism embraced Darwin's theory as a justification for their economic system, and in general, competition in all aspects of life was presumably vindicated by Darwin's theory of evolution. This is the core belief underlying Social Darwinism. Competition is how nature works and competition produces progress, hence competition is good. In fact, the twentieth-century historian J. B. Bury argued that the idea of progress "evolved" into the idea of evolution – evolution presumably providing a scientific justification and explanation for progress built on competition.

But there have been critics of this whole line of thinking connecting evolution with secular progress. Thomas Huxley (1825 – 1895), the great defender of Darwin's theory, took issue with Spencer on whether evolution, a scientific theory, provided a justification for a social or moral philosophy or way of life. How, Huxley argued, does one derive an ethics from statements of fact? "Let us understand, once for all, that the ethical progress of society depends, not on imitating the cosmic process, still less in running from it, but in combating it."

What theorists of progress often conflate is the idea that there is a direction through history (however defined) with the idea that this direction is ethically a good thing. Religious views, such as in Zoroastrianism, Judaism, and Christianity, connected the direction of history with moral advance because God, the source of what is good, is orchestrating the process of history. Secular views of progress, which identified values such as rationality, freedom, wealth, and the well being of humanity as the criteria and goals of progress, provided non-religious ethical ideals to strive for. Progress could be defined relative to such ideals and it could be argued that history was moving toward the increasing realization of these ideals. But it can't be simply assumed that a direction to history means things are getting better in some ethical sense. Does survival of the fittest somehow translate into an ethical prescription? As Green puts it, survival is "a brute fact, not a moral victory."²⁰³

Moreover, for critics of Social Darwinism, the ethical implications drawn from a competitive model of evolution seem to be inhumane. Social Darwinism downplayed cooperation, nurturance, compassion, and community in favor of competition and individualism. It seemed to support a "law of the jungle" morality and philosophy. Also Social Darwinism provided an ethically suspect and self-serving justification for the authority and privileges of those who possessed social and economic power. Social Darwinism supported the status quo and biological racism. Europeans could feel superior to other cultures and other races based on the idea that they were more advanced on the evolutionary scale, and rich capitalists could feel morally exonerated and superior to the poor and weak because they had earned their positions of power through the natural law of competition. Darwin's theory of evolution was interpreted to mean that nature rewarded individual competition and therefore competition was a good thing and those in positions of power were "superior" human beings. Further, the Social Darwinist emphasis on competition and "survival of the fittest" seemed to fit with Hegelian philosophy and its emphasis on conflict as a driving force in progress, as well as Nietzschean philosophy, with its emphasis on individualism and the will to power, thus providing a justification for war, conquest, and the subjugation (or elimination) of those not strong or fit enough to defend themselves.²⁰⁴

Yet in spite of such criticisms of connecting Darwin's theory of evolution with some type of moral or prescriptive theory of progress, it is clear that Darwin did believe in a naturalistic conception of progress. Evolution produces increasing complexity and intelligence and in this sense, evolution is progressive. Whether this direction to evolution is morally good or bad can be debated, and further, which moral ideals should be included in an ethical theory of progress can also be debated, but Darwin's theory does provide a factual hypothesis regarding the natural dimension of evolutionary progress. In this regard, Darwin's theory of evolution aligns with those theorists of progress, such as Smith, Marx, Spencer, and even Hegel, who believed that there was a natural and inevitable direction to time (a natural law of progress). One could say though, quite justifiably, that Darwin's description and explanation of the evolutionary process is unequivocally the most empirically corroborated theory of natural progress to ever have been advanced.

Darwin's ideas on evolution exerted a significant and continued influence on intellectual and popular thinking throughout the latter decades of the nineteenth century and into the twentieth century. Evolution became a general mindset that was increasingly applied to all aspects of natural and human reality. In the twentieth century other areas of science, besides biology and paleontology, including physics, cosmology, psychology, ecology, and anthropology were all influenced by the evolutionary framework. From an evolutionary perspective, nature is a dynamic and changing reality in which forms evolve in complexity rather than being created in their present state at the beginning of time. Order emerges from the bottom up in nature rather than being imposed from above by God.²⁰⁵

In order to understand the impact of evolutionary thinking on subsequent science, philosophy, and general intellectual thought, it is important to distinguish three different though related ideas. The first idea is that biological evolution has occurred within natural history. The second idea is Darwin's theory that biological evolution is due to natural selection. The final idea is the more general concept that all or most natural forms are transformative and evolve in complexity over time.

Darwin explained the increase in complexity in biological forms across time through natural selection, but to recall, Lamarck attempted to explain increasing biological complexity through inheritance of acquired characteristics. Both Lamarck and Darwin agreed that biological evolution had occurred – they differed in their theoretical explanations of the cause behind it happening. Darwin, in fact, though emphasizing the principle of natural selection (which was unique to his theory of evolution), acknowledged that there were perhaps other causative factors at work in evolution – even inheritance of acquired characteristics. It is often argued that evolution is a theory, rather than a fact, but as science writers such as Kenneth Miller and Richard Morris point out, this argument is mistaken and confused. The immense amount of fossil evidence collected over the last two centuries demonstrates the general fact of biological evolution; biological evolution is a general fact not a theory. Evolution can be “seen” in the fossil record. Darwin's specific explanation through natural selection is indeed a theory, yet even here, Darwin's theory is the most scientifically supported and substantiated of any theory of biological evolution.²⁰⁶

The phenomenon of biological evolution should be distinguished from the more general idea of natural and cosmic evolution. Over the last century and a half, since the publication of *On the Origin of Species*, many different aspects of nature have been re-conceptualized in evolutionary terms. It is not just that biological forms evolve, but all other forms in nature from atoms to molecules, planets, solar systems, and galaxies appear to have evolved or emerged from simpler beginnings. Further, building upon the early ideas of Descartes, Herschel, Leibniz, and Kant, contemporary cosmologists describe the entire history of the universe in evolutionary terms, in the sense that order and complexity has developed over time out of chaos and simplicity. Whatever mechanisms are behind natural and cosmic evolution (and there are theories),

the general scientific consensus has grown that all of nature, including humanity, is a result of an evolutionary process.

As one general point regarding both biological and cosmological evolution, even if Darwin's theory of natural selection turns out to be only part of the story of how natural forms evolve, Darwin's belief that evolution can be explained through natural causes and natural laws has emerged as the guiding principle in contemporary science. Supernatural explanations of evolution have increasingly been pushed out of the picture. There continue to be explanations offered of both evolution and the origin of species that postulate some type of purposeful or "intelligent design" or creator. Such explanations, though, are no longer very popular in contemporary science and from a scientific point of view are highly problematic for a variety of reasons.²⁰⁷

Evolution has had a strong impact on philosophy as well as science. Many of the great philosophers of the late nineteenth and early twentieth centuries, such as Charles Sanders Peirce (1839 – 1914) and Alfred North Whitehead (1861 – 1947), attempted to create comprehensive evolutionary theories of reality. Such theories argued in a broad vein that the universe was "process" and "change" rather than a collection of static entities, harkening back to Heraclitus, and that there was a direction to change – an evolutionary direction that involved such factors as the ongoing creation of novelty, increasing complexity and intelligence, and the emergence of mind and consciousness. Spencer, for one, saw mind itself as an evolutionary phenomenon – adaptively advancing in its capacities across time.²⁰⁸

Thus, given its influence on social and anthropological thinking, theories of progress, academic philosophy, and many diverse areas of science, it is clear that the impact of evolutionary thought has been immense. Regardless of whether natural selection turns out to be the total answer to biological evolution, Darwin's theory of evolution instigated and inspired a monumental and pervasive transformation across most areas of human research and thinking. As the historian Peter Watson so aptly puts it, "Evolution is the story of us all."²⁰⁹

One final issue to consider regarding evolutionary theory is the relative significance of competition and cooperation. As noted above, Social Darwinists embraced the idea of competition within Darwin's theory, but Darwin had other thoughts about evolution, especially as expressed in *The Descent of Man*, that revolve around such concepts as love, sympathy, mutuality, and cooperation. To recall, Darwin saw social institutions and morality in humans as a consequence of evolution through natural selection. He believed, though, that integral to human morality and social organizations was a highly developed capacity for concern and caring among humans. Behaviors, feelings, and modes of thinking connected with cooperation and mutual affection would be highly advantageous for the survival of the group. A cooperative group is much more efficient in facing the challenges of life than a non-cooperative group. Hence groups of humans showing greater cooperation and caring would survive, passing on the traits connected with cooperative ethics in its individuals, whereas groups of humans and the individuals in these groups not showing these traits as strongly would falter and fail. Those emotions and moral principles that bind humans together

would be selected for within the evolutionary process. Beginning with Darwin, but continuing to the present day in writers such as E. O. Wilson and Michael Shermer, the argument has been presented that cooperative and caring ethics in humans is a consequence of evolutionary forces at work in our history.²¹⁰

The evolutionary writer David Loye goes so far as to argue that Darwin in *The Descent of Man* emphasized cooperation and caring much more than individual competition and survival of the fittest. Further, according to Loye, Darwin saw the central driving force in the future evolution of humans as morality rather than cut-throat self-centered competition. Loye accuses earlier writers and thinkers of excessively emphasizing the competitive theme in evolutionary theory in order to scientifically justify the competitive and individualist behavior and philosophy of modern Western society. Further, Loye states that Darwin is not fixated on a biological level in understanding past or future human evolution; Darwin also discusses topics connected with mind, education, and intelligence extensively in *The Descent of Man*.²¹¹

The debate continues to the present in contemporary evolutionary thought: What are the relative roles of competition and cooperation in the evolution of life?²¹² Although Darwin is more strongly associated with the theme of competition, especially within Social Darwinism, he saw the significance of both factors in understanding past and future human evolution. In earlier portions of this book, I described the related dual themes in theories of progress of individual freedom and social order: in Hegel, of opposition and synthesis, in Empedocles, of love and hate, in Bloom, of conquest and reciprocity, and in mythology, of the nurturing mother and violent hunter. There seems to be a common theme – a common debate – that takes various forms in understanding the forces that produce change in nature and in human history.

In summary, although there are numerous issues surrounding evolution, many of which Darwin himself was aware in his day, again the general point should be highlighted that the historical phenomenon of evolution, both biological and cosmological, is supported by a vast wealth of factual evidence. There are debates as to whether evolution is always gradual or whether there are sudden spurts at times. There are debates over whether natural selection can explain all of evolution or whether there is some other mechanism or cause involved. There is the issue above regarding the relative importance of cooperation and competition. There are debates over the connection between evolution and progress. But through a series of discoveries and insights beginning in the seventeenth century, and culminating in Darwin's extensive research and grand theoretical synthesis, the general phenomenon of evolution has become increasingly apparent to scientists, philosophers, and other students of nature. Creationism and other theories of divine intervention – in particular the theory that natural forms were instantaneously created sometime in the past – though highly resistant to the discoveries of evolutionary science, seem increasingly dubious. As Kenneth Miller states "It is high time that we grew up and left the Garden."²¹³

Evolution not only overturned static creationism as expressed in Christianity, as well as teleological and anthropocentric views that saw the

universe as purposefully created for the benefit of man, it also, perhaps most fundamentally, overturned the Platonic-Newtonian static image of the universe.²¹⁴ In the nineteenth and twentieth centuries, the pivotal theory that has influenced the course of most of science has been the theory of evolution. In a second major wave of scientific thinking, the concept of dynamic evolutionary change replaced Newton's stable and harmonious machine as the central idea in science. In the process of this deep and pervasive transformation in science, Newton's clockwork model of the universe was overturned, nature and reality were redefined, concepts of progress and time significantly changed, and the origin and development of the universe and humanity was opened to scientific study and debate. As a result, contemporary science views reality, time, order, and the future in predominantly evolutionary and dynamical terms and the entities and laws of nature no longer look so permanent. This evolutionary transformation drew its fundamental inspiration from Darwin.

References Chapter Four

- ¹ Durant, Will, and Durant, Ariel *The Story of Civilization VII: The Age of Reason Begins*. New York: Simon and Schuster, 1961; Nisbet, Robert *History of the Idea of Progress*. New Brunswick: Transaction Publishers, 1994.
- ² Best, Steven and Kellner, Douglas *The Postmodern Turn*. New York: The Guilford Press, 1997, Page 18.
- ³ Anderson, Walter Truett *All Connected Now: Life in the First Global Civilization*. Boulder: Westview Press, 200, Page 32.
- ⁴ Shlain, Leonard *The Alphabet Versus the Goddess: The Conflict Between Word and Image*. New York: Penguin Arkana, 1998.
- ⁵ Ray, Paul and Anderson, Sherry *The Cultural Creatives: How 50 Million People are Changing the World*. New York: Three Rivers Press, 2000, Pages 70 - 71.
- ⁶ Nisbet, Robert, 1994, Pages 79 - 81.
- ⁷ Watson, Peter *Ideas: A History of Thought and Invention from Fire to Freud*. New York: HarperCollins Publishers, 2005, Pages 319, 331 – 333, 742.
- ⁸ Christian, David *Maps of Time: An Introduction to Big History*. Berkeley, CA: University of California Press, 2004, Pages 342 – 352.
- ⁹ Christian, David, 2004, Pages 354 – 364.
- ¹⁰ Watson, Peter, 2005, Page 315.
- ¹¹ Polak, Frederik *The Image of the Future*. Abridged Edition by Elise Boulding. Amsterdam: Elsevier Scientific Publishing Company, 1973, Pages 70 – 73; Watson, Peter, 2005, Page 333.
- ¹² Watson, Peter, 2005, Page 355; Polak, Frederik, 1973, Pages 68 – 70.
- ¹³ Watson, Peter, 2005, Pages 339 – 362.
- ¹⁴ Watson, Peter, 2005, Pages 363 – 369.
- ¹⁵ Watson, Peter, 2005, Page 369.
- ¹⁶ Watson, Peter, 2005, Pages 370 – 371.
- ¹⁷ Wikipedia – Robert Grosseteste - <http://en.wikipedia.org/wiki/Grosseteste>; Wikipedia – Roger Bacon - http://en.wikipedia.org/wiki/Roger_Bacon; Watson, Peter, 2005, Page 376.
- ¹⁸ Watson, Peter, 2005, Pages 331, 370.
- ¹⁹ Christian, David, 2004, Pages 335 – 342, 367 – 376.
- ²⁰ Tuckman, Barbara *A Distant Mirror: The Calamitous 14th Century*. New York: Ballantine Books, 1978.
- ²¹ Shlain, Leonard, 1998, Page 309.
- ²² Watson, Peter, 2005, Pages 320 – 326.
- ²³ Shlain, Leonard, 1998, Chapter Twenty-Nine.
- ²⁴ Watson, Peter, 2005, Pages 392 – 394.
- ²⁵ Watson, Peter, 2005, Pages 377 – 388.
- ²⁶ Watson, Peter, 2005, Page 396; Wikipedia – Petrarch - <http://en.wikipedia.org/wiki/Petrarch>.
- ²⁷ Watson, Peter, 2005, Pages 400 – 401; Wikipedia – Erasmus - <http://en.wikipedia.org/wiki/Erasmus> .
- ²⁸ Watson, Peter, 2005, Pages 397 – 398, 409 – 410.
- ²⁹ Watson, Peter, 2005, Pages 394 – 395, 403, 411 – 412.
- ³⁰ Wikipedia – Leonardo da Vinci - http://en.wikipedia.org/wiki/Leonardo_da_Vinci; Lombardo, Thomas *The Reciprocity of Perceiver and Environment: The Evolution of James J. Gibson's Ecological Psychology*. Hillsdale, NJ: Lawrence Erlbaum Associates, 1987, Pages 50 – 53.
- ³¹ Nisbet, Robert, 1994, Pages 101 – 110; Morris, Richard *Time's Arrows: Scientific Attitudes Toward Time*. New York: Touchstone, 1986, Pages 65 – 67.
- ³² Watson, Peter, 2005, Pages 460 – 461.
- ³³ Nisbet, Robert, 1994, Pages 118 - 124; Shlain, Leonard, 1998, Chapter Thirty.
- ³⁴ Shlain, Leonard, 1998, Chapter 30; Watson, Peter, 2005, Pages 462 – 469.
- ³⁵ Watson, Peter, 2005, Chapter Twenty-One.
- ³⁶ Christian, David, 2004, Pages 380 – 401.

- ³⁷ Whitehead, Alfred North *Science and the Modern World*. New York: The Free Press, 1925; Hall, A. R. *The Scientific Revolution 1500 – 1800: The Formation of the Modern Scientific Attitude*. Boston: The Beacon Press, 1954; Singer, Charles *A Short History of Scientific Ideas to 1900*. London: Oxford University Press, 1959; Cronin, Vincent *The View From Planet Earth: Man Looks at the Cosmos*. New York: Quill, 1981, Chapters Five to Eight; Ferris, Timothy *Coming of Age in the Milky Way*. New York: William Morrow and Company, 1988, Chapters Four, Five, and Six.
- ³⁸ Watson, Peter, 2005, Pages 474 – 475.
- ³⁹ Watson, Peter, 2005, Pages 476 – 477, 516 - 517; Wikipedia – Galileo Galilei - <http://en.wikipedia.org/wiki/Galileo>.
- ⁴⁰ Wilson, E.O. *Consilience: The Unity of Knowledge*. New York: Alfred A. Knopf, 1998, Pages 24 – 31; Nisbet, Robert, 1994, Pages 112 – 117; Tarnas, Richard *The Passion of the Western Mind: Understanding the Ideas that have Shaped Our World View*. New York: Ballantine, 1991, Pages 272 – 281.
- ⁴¹ Wilson, E. O., 1998, Pages 24 – 30; Wilson, E.O. “Back from Chaos” *The Atlantic Monthly*, March, 1998b.
- ⁴² Oliver, Martyn *History of Philosophy*. New York: MetroBooks, 1997, Pages 66 - 67.
- ⁴³ Watson, Peter, 2005, Pages 489 – 490.
- ⁴⁴ Wilson, E. O., 1998b.
- ⁴⁵ Oliver, Martyn, 1997, Pages 66 – 67; Solomon, Robert *The Big Questions: A Short Introduction to Philosophy*. 6th Ed. Orlando, Florida: Harcourt College Publishers, 2002, Pages 19 – 21; Russell, Bertrand *A History of Western Philosophy*. New York: Simon and Schuster, 1945, Pages 541 – 545.
- ⁴⁶ Wilson, E. O., 1998; Wilson, E.O., 1998b.
- ⁴⁷ Nisbet, Robert, 1994, Pages 112 – 115.
- ⁴⁸ Smith, Norman Kemp *Descartes Philosophical Writings*. New York: The Modern Library, 1958, Pages 91 – 144, 161 - 248; Smith, T.V. and Grene, Marjorie *From Descartes to Locke*. Chicago: The University of Chicago Press, 1957, Chapter One; Solomon, Robert, 2002, Pages 168 – 170; Russell, Bertrand, 1945, Pages 557 - 568.
- ⁴⁹ Watson, Peter, 2005, Pages 491, 515 – 517.
- ⁵⁰ Wilson, E. O., 1998b.
- ⁵¹ Morris, Richard, 1986, Pages 69 - 72.
- ⁵² Christian, David, 2004, Page 431.
- ⁵³ Watson, Peter, 2005, Pages 739 – 740.
- ⁵⁴ Fraser, J. T. *Time, the Familiar Stranger*. Redmond, Washington: Tempus, 1987, Page 41.
- ⁵⁵ Fraser, J. T., 1987, Page 40.
- ⁵⁶ Watson, Peter, 2005, Pages 481 – 483.
- ⁵⁷ Smolin, Lee *The Life of the Cosmos*. Oxford: Oxford University Press, 1997, Pages 142 – 143.
- ⁵⁸ Berman, Morris *The Reenchantment of the World*. New York: Bantam, 1981, Chapters Three and Four.
- ⁵⁹ Ackoff, Russell “From Mechanistic to Social Systematic Thinking” *Systems Thinking in Action Conference*, Pegasus Communications, Inc., 1993; Capra, Fritjof *The Turning Point*. New York: Bantam, 1983, Chapter Two.
- ⁶⁰ Watson, Peter, 2005, Pages 484 – 489.
- ⁶¹ Watson, Peter, 2005, Pages 492 – 495.
- ⁶² Randall, John *Aristotle*. New York: Columbia University Press, 1960.
- ⁶³ Goerner, Sally *Chaos and the Evolving Ecological Universe*. Luxembourg: Gordon and Breach, 1994, Chapter One.
- ⁶⁴ Whitehead, Alfred North, 1925; Smolin, Lee, 1997.
- ⁶⁵ Koestler, Arthur *The Act of Creation*. New York: Dell, 1964, Chapter Six.
- ⁶⁶ Nisbet, Robert, 1994, Pages 4 - 5.
- ⁶⁷ Nisbet, Robert, 1994, Page 317.
- ⁶⁸ Smolin, Lee, 1997, Chapters Sixteen to Eighteen.
- ⁶⁹ Nisbet, Robert, 1994, Pages 156 – 159.
- ⁷⁰ Nisbet, Robert, 1994, Pages 124 - 139.

-
- ⁷¹ Watson, Peter, 2005, Pages 497 – 498.
- ⁷² Watson, Peter, 2005, Pages 501 – 502.
- ⁷³ Watson, Peter, 2005, Pages 503 – 505.
- ⁷⁴ Smith, T.V. and Grene, Marjorie, 1957, Pages 339 – 454; Watson, Peter, 2005, Page 509.
- ⁷⁵ Elwes, R.H.E. (Ed.) *Spinoza: On the Improvement of the Understanding, The Ethics, and Correspondence*. New York: Dover Publications, Inc., 1955; Damasio, Antonio *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain*. Orlando, Florida: Harcourt, Inc., 2003; Watson, Peter, 2005, Pages 505 – 507.
- ⁷⁶ Wikipedia – Baruch Spinoza - <http://en.wikipedia.org/wiki/Spinoza>.
- ⁷⁷ Watson, Peter, 2005, Pages 509 – 527; Wikipedia – Voltaire - <http://en.wikipedia.org/wiki/Voltaire>.
- ⁷⁸ Chappell, V. C. *The Philosophy of David Hume*. New York: The Modern Library, 1963; Kant, Immanuel *Critique of Pure Reason*. Amherst, New York: Prometheus Books, 1990; Russell, Bertrand, 1945, Pages 659 – 674, 701 – 718; Solomon, Robert, 2002, Pages 170 – 175; Tarnas, Richard, 1991, Pages 336 – 354.
- ⁷⁹ Nisbet, Robert, 1994, Pages 179 - 186.
- ⁸⁰ Nisbet, Robert, 1994, Pages 160 – 167; Watson, Peter, 2005, Pages 507 – 509.
- ⁸¹ Nisbet, Robert, 1994, Pages 134 – 138.
- ⁸² Watson, Peter, 2005, Pages 532, 546 – 547.
- ⁸³ Condorcet's book was published after his death.
- ⁸⁴ Nisbet, Robert, 1994, Pages 206 - 212; Bell, Wendell *Foundations of Future Studies: Human Science for a New Era*. Vol. II. New Brunswick: Transactions Publishers, 1997, Pages 32 - 38; Wilson, E. O., 1998, Pages 15 – 22; Wilson, E. O., 1998b.
- ⁸⁵ Watson, Peter, 2005, Pages 547 – 548.
- ⁸⁶ D'Souza, Dinesh *The Virtue of Prosperity: Finding Values in an Age of Techno-Affluence*. New York: The Free Press, 2000, Pages 169 - 183.
- ⁸⁷ Watson, Peter, 2005, Pages 550 – 571.
- ⁸⁸ Christian, David, 2004, Pages 406 – 432.
- ⁸⁹ Nisbet, Robert, 1994, Pages 187 - 193.
- ⁹⁰ Watson, Peter, 2005, Pages 541 – 543.
- ⁹¹ Wikipedia – Thomas Paine - http://en.wikipedia.org/wiki/Thomas_Paine; Wikipedia – Thomas Jefferson - http://en.wikipedia.org/wiki/Thomas_Jefferson; Watson, Peter, 2005, Pages 575 – 585.
- ⁹² Cornish, Edward "Futurists" in Kurian, George Thomas, and Molitor, Graham T.T. (Ed.) *Encyclopedia of the Future*. New York: Simon and Schuster Macmillan, 1996.
- ⁹³ Miller, Kenneth *Finding Darwin's God: A Scientist's Search for Common Ground between God and Evolution*. New York: Perennial, 1999, Pages 165 - 195.
- ⁹⁴ Bell, Wendell, Vol. II, 1997, Chapter One; Wilson, E. O., 1998, Chapter Eleven; Wilson, E.O. "The Biological Basis of Morality" *The Atlantic Monthly*, April, 1998c.
- ⁹⁵ Nisbet, Robert, 1994, Pages 153 – 156, 212 – 216; Watson, Peter, 2005, Pages 546 – 548.
- ⁹⁶ Nisbet, Robert, 1994, Pages 229 – 236, 251 - 258.
- ⁹⁷ Watson, Peter, 2005, Pages 548 – 549, 648 – 653.
- ⁹⁸ Postrel, Virginia "Technocracy R.I.P." *Wired*, January, 1998.
- ⁹⁹ Nisbet, Robert, 1994, Chapter Seven.
- ¹⁰⁰ Watson, Peter, 2005, Page 549.
- ¹⁰¹ Christian, David, 2004, Page 393.
- ¹⁰² Christian, David, 2004, Pages 427 – 430.
- ¹⁰³ Nisbet, Robert, 1994, Pages 220 – 223; Watson, Peter, 2005, Page 548.
- ¹⁰⁴ Bell, Wendell, Vol. II, 1997, Pages 7 – 14.
- ¹⁰⁵ Nisbet, Robert, 1994, Pages 112 – 115.
- ¹⁰⁶ Bell, Wendell, Vol. II, 1997, Chapter One; Clute, John *Science Fiction: The Illustrated Encyclopedia*. London: Doarling Kindersley, 1995, Pages 34 – 35.
- ¹⁰⁷ Wagar, W. Warren "Utopias, Futures, and H.G. Wells' Open Conspiracy" in Didsbury, Howard F. (Ed.) *Frontiers of the 21st Century: Prelude to the New Millennium*. Bethesda, Maryland: World Future Society, 1999.

-
- ¹⁰⁸ Bell, Wendell, Vol. II, 1997, Chapter One.
- ¹⁰⁹ Nisbet, Robert, 1994, Page 239.
- ¹¹⁰ Nisbet, Robert, 1994, Chapters Six and Seven.
- ¹¹¹ Nisbet, Robert, 1994, Pages 258 - 267.
- ¹¹² Wilson, E. O., 1998b.
- ¹¹³ Christian, David, 2004, Pages 432 – 439.
- ¹¹⁴ Best, Steven and Kellner, Douglas, 1997, Page 18.
- ¹¹⁵ Ray, Paul and Anderson, Sherry, 2000, Pages 25 – 30, 70 - 78.
- ¹¹⁶ Best, Steven and Kellner, Douglas, 1997, Pages 202.
- ¹¹⁷ Goerner, Sally, 1994; Prigogine, Ilya *The End of Certainty: Time, Chaos, and the New Laws of Nature*. New York: The Free Press, 1997.
- ¹¹⁸ Wilson, E. O., 1998, Chapter One.
- ¹¹⁹ Nisbet, Robert, 1994, Pages 275 – 286; Tarnas, Richard, 1991, Pages 379 – 383.
- ¹²⁰ Russell, Bertrand, 1945, Chapter Twenty-Two.
- ¹²¹ Palmer, Donald *Looking at Philosophy: The Unbearable Heaviness of Philosophy Made Lighter*. 3rd Ed. Boston: McGraw Hill, 2001, Pages 224 – 232, 243.
- ¹²² Russell, Bertrand, 1945, Pages 741 – 742.
- ¹²³ Adams, Fred and Laughlin, Greg *The Five Ages of the Universe: Inside the Physics of Eternity*. New York: The Free Press, 1999, Pages xvii – xxi; Wright, Robert *Nonzero: The Logic of Human Destiny*. New York: Pantheon Books, 2000, Chapter Two.
- ¹²⁴ Solomon, Robert, 2002, Pages 86 – 87, 144 – 145.
- ¹²⁵ Fukuyama, Francis *The End of History and the Last Man*. New York: The Free Press, 1992, Pages 62 – 63.
- ¹²⁶ Fukuyama, Francis, 1992, Page 60.
- ¹²⁷ Nisbet, Robert, 1994, Pages 220, 267 – 269.
- ¹²⁸ Russell, Bertrand, 1945, Page 737.
- ¹²⁹ Nisbet, Robert, 1994, Page 269.
- ¹³⁰ Solomon, Robert, 2002, Pages 220 – 221.
- ¹³¹ Fukuyama, Francis, 1992, Pages 59 – 67, 143 – 156; Palmer, Donald, 2001, Page 231 – 232.
- ¹³² Russell, Bertrand, 1945, Pages 741- 742.
- ¹³³ Fukuyama, Francis, 1992, Page 64 – 69.
- ¹³⁴ Palmer, Donald, 2001, Pages 258 – 261.
- ¹³⁵ Watson, Peter, 2005, Pages 550 – 571.
- ¹³⁶ Nisbet, Robert, 1994, Pages 258 – 267.
- ¹³⁷ Russell, Bertrand, 1946, Page 782; Bell, Wendell, 1997, Vol. II, Pages 44 – 63.
- ¹³⁸ Russell, Bertrand, 1946, 782 – 790; Palmer, Donald, Pages 259 – 261.
- ¹³⁹ Tarnas, Richard, 1991, Pages 314, 329.
- ¹⁴⁰ Palmer, Donald, 2001, Pages 259 – 260.
- ¹⁴¹ Best, Steven and Kellner, Douglas, 1997, Pages 50 – 57.
- ¹⁴² Bell, Wendell, 1997, Vol. II, Pages 48, 63.
- ¹⁴³ Bell, Wendell, 1997, Vol. II, Pages 44 – 63; Russell, Bertrand, 1946, Pages 782 – 790.
- ¹⁴⁴ Tarnas, Richard, 1991, Page 366.
- ¹⁴⁵ Watson, Peter, 2005, Pages 610, 733.
- ¹⁴⁶ Tarnas, Richard, 1991, Pages 366 – 378; Russell, Bertrand, 1946, Pages 675 – 684; Watson, Peter, 2005, Pages 613, 732.
- ¹⁴⁷ Watson, Peter *The Modern Mind: An Intellectual History of the 20th Century*. New York: HarperCollins Perennial, 2001, Pages 171 – 173.
- ¹⁴⁸ Watson, Peter, 2005, Page 613; Nisbet, Robert, Pages 318 – 320.
- ¹⁴⁹ Watson, Peter, 2005, Pages 606 – 623.
- ¹⁵⁰ Watson, Peter, 2005, Pages 589 – 605.
- ¹⁵¹ Palmer, Donald, 2001, Pages 233 – 242; Russell, Bertrand, 1946, Pages 753 – 759; Nisbet, Robert, Pages 319 – 320.
- ¹⁵² Palmer, Donald, 2001, Pages 242 – 253; Best, Steven and Kellner, Douglas, 1997, Pages 40 – 50.
- ¹⁵³ Watson, Peter, 2001, Page 39.

-
- ¹⁵⁴ Solomon, Robert, 2002, Pages 61 - 63, 92, 109, 265, 286 – 289; Best, Steven and Kellner, Douglas, 1997, Pages 57 – 77. .
- ¹⁵⁵ Palmer, Donald, 2001, Pages 267 – 275; Watson, Peter, 2001, Pages 39 – 40; Tarnas, Richard, 1991, Pages 370 – 371; Best, Steven and Kellner, Douglas, 1997, Page 65.
- ¹⁵⁶ Best, Steven and Kellner, Douglas, 1997, Pages 59-60, 70; Solomon, Robert, 2002, Page 370.
- ¹⁵⁷ Best, Steven and Kellner, Douglas, 1997, Page 59; Russell, Bertrand, 1946, Page 760; Solomon, Robert, 2002, Pages 368 – 370; Watson, Peter, 2001, Page 40.
- ¹⁵⁸ Tarnas, Richard, 1991, Page 370; Best, Steven and Kellner, Douglas, 1997, Pages 67 – 71; Palmer, Donald, 2001, Pages 268 – 269.
- ¹⁵⁹ Best, Steven and Kellner, Douglas, 1997, Pages 57, 64 – 65, 73.
- ¹⁶⁰ Solomon, Robert, 2002, Pages 92, 109, 286-289; Palmer, Donald, 2001, Pages 272 – 273.
- ¹⁶¹ Best, Steven and Kellner, Douglas, 1997, Pages 60 – 62, 67, 71.
- ¹⁶² Palmer, Donald, 2001, Page 272; Kaufmann, Walter (Ed.) *The Portable Nietzsche*. New York: The Viking Press, 1954, Page 143.
- ¹⁶³ Best, Steven and Kellner, Douglas, 1997, Pages 62 – 63.
- ¹⁶⁴ Kaufmann, Walter, 1954; Best, Steven and Kellner, Douglas, 1997, Page 73.
- ¹⁶⁵ Russell, Bertrand, 1946, Pages 760 – 773.
- ¹⁶⁶ Darwin, Charles *On the Origin of Species by Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (1859). New York: New American Library, 1958; Dennett, Daniel C. *Darwin's Dangerous Idea*. New York: Simon and Schuster, 1995, Page 21.
- ¹⁶⁷ Watson, Peter, 2005, Page 641.
- ¹⁶⁸ Green, John *The Death of Adam: Evolution and Its Impact on Western Thought*. Ames, Iowa: Iowa State University Press, 1959, Pages 1 – 13.
- ¹⁶⁹ Gould, Stephen Jay *Time's Arrow Time's Cycle: Myth and Metaphor in the Discovery of Geological Time*. Cambridge: Harvard University Press, 1987, Pages 21 – 51.
- ¹⁷⁰ Watson, Peter, 2005, Page 14.
- ¹⁷¹ Green, John, 1959, Pages 43 – 48, 89 – 127.
- ¹⁷² Green, John, 1959, Pages 31 – 35.
- ¹⁷³ Green, John, 1959, Pages 28 – 30.
- ¹⁷⁴ Watson, Peter, 2005, Page 548.
- ¹⁷⁵ Green, John, 1959, Pages 36 – 37.
- ¹⁷⁶ Miller, Kenneth, 1999, Pages 36 – 37.
- ¹⁷⁷ Watson, Peter, 2001, Pages 249 – 255.
- ¹⁷⁸ Tarnas, Richard, 1991, Pages 330 – 331.
- ¹⁷⁹ Gould, Stephen, 1987, Pages 1 – 3; Watson, Peter, 2005, Pages 631 – 633.
- ¹⁸⁰ Green, John, 1959, Pages 76 – 81; Gould, Stephen, 1987, Pages 61 – 97.
- ¹⁸¹ Green, John, 1959, Pages 131 – 137.
- ¹⁸² Green, John, 1959, Pages 55 -59, 138 – 155.
- ¹⁸³ Green, John, 1959, Pages 106 -109, 116 -119, 123 -125.
- ¹⁸⁴ Watson, Peter, 2005, Page 633; Green, John, 1959, Pages 86 – 87.
- ¹⁸⁵ Watson, Peter, 2005, Pages 13 – 17, 624 – 629.
- ¹⁸⁶ Green, John, 1959, Pages 155 – 166.
- ¹⁸⁷ Green, John, 1959, Pages 166 – 169; Gould, Stephen, 1987, Page 158; Watson, Peter, 2005, Pages 637 – 640.
- ¹⁸⁸ Nisbet, Robert, 1994, Pages 216 – 220; Green, John, 1959, Pages 258 – 260.
- ¹⁸⁹ Green, John, 1959, Pages 249 – 260; Gould, Stephen, 1987, Pages 99 – 179.
- ¹⁹⁰ Gould, Stephen, 1987, Pages 117 – 126.
- ¹⁹¹ Green, John, 1959, Pages 244 – 247.
- ¹⁹² Green, John, 1959, Pages 264 – 265; Miller, Kenneth, 1999, Pages 7 – 10.
- ¹⁹³ Mead, George Herbert *Movements of Thought in the Nineteenth Century*. Moore, Merritt (Ed.) Chicago: University of Chicago Press, 1936, Pages 157 – 160; Green, John, 1959, Pages 270 – 271; Morris, Richard *The Evolutionists: The Struggle for Darwin's Soul*. New York: W.H. Freeman and Company, 2001, Pages 52 – 54.

-
- ¹⁹⁴ Edis, Tanner *The Ghost in the Universe: God in Light of Modern Science*. Amherst, New York: Prometheus Books, 2002, Chapter Two; Watson, Peter, 2001, Page 115; Miller, Kenneth, 1999, Pages 233 – 239; Green, John, 1959, Pages 301 – 305.
- ¹⁹⁵ Fraser, J. T., 1987, Page 132.
- ¹⁹⁶ Edis, Tanner, 2002, Page 55.
- ¹⁹⁷ Nisbet, Robert, 1994, Page 175; Green, John, 1959, Pages 297 – 298, 327 - 328.
- ¹⁹⁸ Watson, Peter, 2005, Page 644.
- ¹⁹⁹ Watson, Peter, 2005, Page 628.
- ²⁰⁰ Green, John, 1959, Pages 201 – 219, 320 – 335.
- ²⁰¹ Tarnas, Richard, 1991, Pages 326 – 327.
- ²⁰² Watson, Peter, 2001, Pages 41 – 43, 245 – 246; Morris, Richard, 1986, Pages 80 – 85; Watson, Peter, 2005, Pages 674 – 676.
- ²⁰³ Green, John, 1959, Page 335.
- ²⁰⁴ Shlain, Leonard, 1998, Page 379; Watson, Peter, 2001, Pages 40 – 41.
- ²⁰⁵ Wilson, E. O. *Sociobiology: The New Synthesis*. Cambridge, MA: Harvard University Press, 1975; Gribbin, John *Genesis: The Origins of Man and the Universe*. New York: Delta, 1981; Prigogine, Ilya and Stengers, Isabelle *Order out of Chaos: Man's New Dialogue with Nature*. New York: Bantam, 1984; Davies, Paul *The Cosmic Blueprint: New Discoveries in Nature's Creative Ability to Order the Universe*. New York: Simon and Schuster, 1988; Smolin, Lee, 1997; Loye, David *The Evolutionary Outrider: The Impact of the Human Agent on Evolution*. Westport, CT: Praeger, 1998; Sahtouris, Elisabet *EarthDance: Living Systems in Evolution*. Lincoln, Nebraska: IUniverse Press, 2000; Wright, Robert, 2000; Watson, Peter, 2001, Pages 245 – 255; Morowitz, Harold *The Emergence of Everything: How the World Became Complex*. Oxford: Oxford University Press, 2002; Loye, David (Ed.) *The Great Adventure: Toward a Fully Human Theory of Evolution*. Albany, New York: State University of New York Press, 2004.
- ²⁰⁶ Morris, Richard, 2001, Pages 45 – 46; Miller, Kenneth, 1999, Page 53 – 56.
- ²⁰⁷ Miller, Kenneth, 1999, Chapters Two to Six; Edis, Tanner, Chapter Two. But also see Gardner, James *Biocosm: The New Scientific Theory of Evolution: Intelligent Life is the Architect of the Universe*. Makawao, Maui, Hawaii: Inner Ocean, 2003 for a naturalistic theory of intelligent design.
- ²⁰⁸ Green, John, 1959, Pages 305 – 306; Whitehead, Alfred North *Process and Reality: An Essay in Cosmology*. New York: Harper and Row, 1929.
- ²⁰⁹ Watson, Peter, 2001, Page 772.
- ²¹⁰ Wilson, E.O., 1998c; Shermer, Michael *The Science of Good and Evil*. New York: Times Books, 2004.
- ²¹¹ Loye, David "Darwin, Maslow, and the Fully Human Theory of Evolution" in Loye, David (Ed.) *The Great Adventure: Toward a Fully Human Theory of Evolution*. Albany, New York: State University of New York Press, 2004. (b)
- ²¹² Margulis, Lynn *Symbiosis in Cell Evolution*. 2nd Ed. New York: W. H. Freeman, 1993; Margulis, Lynn "Gaia is a Tough Bitch" in Brockman, John *The Third Culture*. New York: Touchstone, 1995; Sahtouris, Elisabet, 2000.
- ²¹³ Miller, Kenneth, 1999, Page 56.
- ²¹⁴ Watson, Peter, 2005, Page 641.