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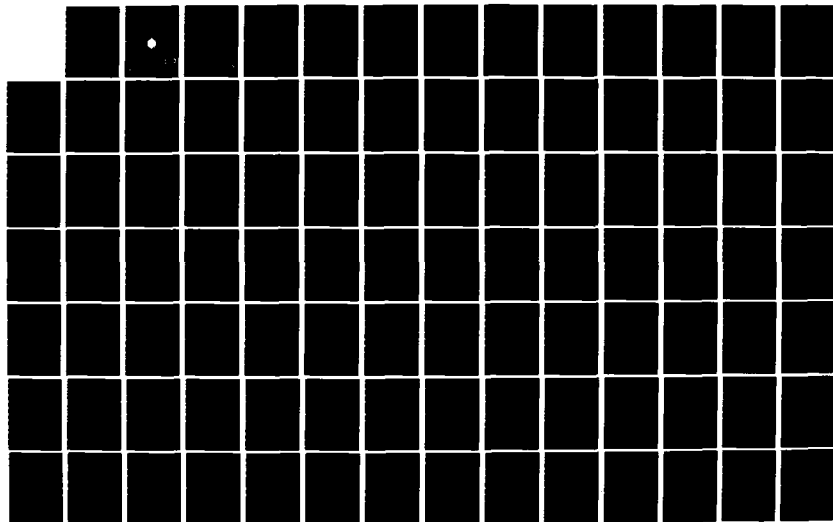
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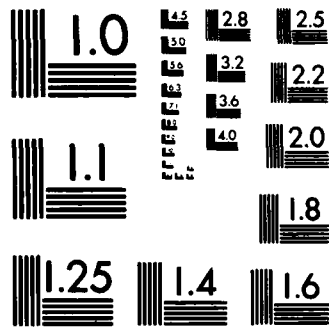
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A TRIDENT SCHOLAR PROJECT REPORT

NO. 125

REASON AND THE "NEW PHILOSOPHY":

An Historical-Literary Exploration of the Relationship between
Reason and the Humanities in the 17th Century

UNITED STATES NAVAL ACADEMY
ANNAPOLIS, MARYLAND
1983

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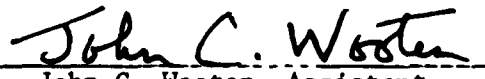
Mark L. Gorenflo, Midshipman
First Class, USN

Accepted for Trident Scholar
Committee:



Chairman

Advisor:



John C. Wooten, Assistant
Professor, English Department
Department of English

June 20, 1983
Date

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Milton and the "New Philosophy"

An Historical-Literary Exploration of the Relationship Between Science and the Humanities in the 17th Century

ABSTRACT

- In our present age, when science and technology advances at a rate which seriously challenges man's ability to properly incorporate these developments in his society, the relationship between the principles and objects of empirical science and those of humanistic studies has come under close and critical scrutiny. Modern society, however, is not unique in facing this dilemma. Seventeenth century England, where an empirical approach to the world was new and challenging, often saw the foundations of its social, political and religious thought under attack, both overt and subtle, by empirical thinkers and scientists, known to the world as the "New Philosophers."

Midshipman Gorenflo studied these complex and seminal currents of thought through research into both primary and secondary sources. Using the writings of Michel de Montaigne, Sir Thomas Browne, Thomas Hobbes, Abraham Cowley and Sir Francis Bacon as a backdrop, Midshipman Gorenflo then focused his research on the figure of John Milton, a man deeply involved in the political, religious and literary issues of his day.

In John Milton, Midshipman Gorenflo found a poet who was concerned with and sympathetic to the new scientific inquiries and methods. He incorporated empiric concerns with space and dynamics into his epic poetic works. Above all, Milton was dedicated to changing society as he found it into a new, righteous, Christian commonwealth in which empiric science, guided by the

precepts of his faith and concern for the dignity of man, would play an important, though not paramount, role.

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PREFACE

The title of this project is "Milton and the 'New Philosophy': An Historical-Literary Exploration of the Relationship between Science and the Humanities in the 17th Century." For even the most glib, this title is quite a mouthful and I have often stretched the attention spans of even the most well-meaning of my friends by reciting it. The more faint-hearted have simply responded with a noncommittal nod and immediately moved on to another, hopefully less arcane and obtuse subject, like the frequency analysis of a super-heterodyne receiver or laplace transforms or the works of Thomas Pynchon. But for me the subject has grown more and not less interesting with the passage of time and with my research--an endeavor which I believe to have begun quite a few years before I submitted my proposal last spring.

My first encounter with the issue of science and the humanities occurred when I was in high school, attending a summer enrichment program sponsored by the Virginia State Department of Education at Mary Baldwin College in Staunton. Laced between my exposure to astronomy and political science [not to mention the Statler Brothers, Jerry Falwell and grits - Staunton, being the birthplace of Woodrow Wilson, prides itself in its eclecticism], I had the great good fortune of watching Jacob Bronowski's brilliant series "The Ascent of Man" and discussing the episodes with my contemporaries. Bronowski himself was a delight to watch. He would position himself in the most unusual and visually striking locales to be found on this planet, always in an outfit cobbled together with all the elan and panache of a color-blind denizen of the Rive Gauche. More importantly, his ideas and demonstrations I found exciting and challenging. Educated as a mathematician, in the highly imaginative field

of topology, Bronowski interested himself in art, religion and literature, on the one hand, and biology, sociology and nuclear physics on the other. I envied his range of interests and his depth of comprehension. Throughout the series, Bronowski attempted to account for man's development of civilization, in all of its manifestations, from the era of Australopithicus to the latest creations of Homo Sapiens.

Bronowski held as one of his primary precepts the idea that art and science represent equally valid manifestations of man's curiosity and his creative powers. Springing from the same source of equal value, both art and science have played critical roles in man's ascent from the primordial past represented in the Olduvai Gorge. In simple terms, science made possible the great concentrations of population which are prerequisites of civilization; art, in equally simple terms, gave these concentrations beauty, arranged them in harmonies and proportions pleasing to man's aesthetic sense and figured forth the principles of justice, equity, morals and manners which make it possible for men to live in close proximity without the continual eruption of spontaneous homicide.

With this seed of curiosity in both the arts and the sciences consciously planted in my mind, I entered the Naval Academy and, for a host of reasons whose recounting would seriously presume upon the cordiality of a captive readership, I became an English major. Very suddenly, I came to realize that the idyllic view that Bronowski had painted of art and science walking hand in hand as equal partners in man's development of himself is seriously contested at the Naval Academy. As a member of the twenty percent of the Brigade who choose to study in a "bull" major, I quickly found myself in a discredited minority whose value as midshipmen was routinely a butt for jokes and rather uncomplimentary speculation. Furthermore, reacting in a manner typical to an

assailed minority, my fellow "bull" majors viewed their scientific contemporaries with equal scorn, expressed with their greater felicity with the English language. As a result of my personal interest in both the arts and the sciences, I attempted to create my own course of studies which would integrate the best of both worlds in one syllabus. Despite my purported neutrality in the sectarian battles between the engineering and the humanities students, I too often fell prey to a kind of provincial pride in my studies: when I surpassed my engineer comrades in an engineering course I gloated with private glee; of course, when I fell short in the same classes, I could rationalize my shortfall with an all purpose waiver - "Of course I did poorly - after all, I'm just an English major." After three years of studies, however, I began to appreciate the challenges and demands of both disciplines. When the possibility presented itself to study a topic of my own choosing for my First Class year as a Trident Scholar, I knew that whatever I chose would have to deal with the problems and the issues which these two methods of approaching life - the scientific and the artistic - have raised for mankind.

As a means of focusing my research into this question which Bronowski first framed for me, I chose the literary figure of John Milton for several reasons. As a foundation, I had studied the poetry of Milton in a seminar course as a Second Class and had been both frustrated and stimulated by the fact that you can't just study Milton once; the range of his learning and the grandeur of his poetic expression leave the neophyte student of Milton with barely an appreciation for his literal meaning, let alone his more profound meanings. I viewed the Trident Scholarship as a means of tackling Milton for a second time on a more long term basis. Secondly, I admired Milton for his involvement in the world around him. He was intimately involved in the issues confronting his England. He used his literary skills to promote the cause of

radical Puritanism and to defend the actions of a Parliament whose regicidal actions had scandalized the European world and threatened to bring the wrath of the Catholic powers down upon an England whom Milton viewed as the new, upright Jerusalem. His defense of the English people in both his poetry and prose showed the power and force which art can bring to bear in the world of men and their machines. Finally, Milton lived in an age where the tension between the empirical sciences and the liberal arts reached an important plateau. The "new philosophy" posed questions which many educated men were loath to pursue. For many, this philosophy based merely upon the consideration of the material world in which man finds himself posed unacceptable challenges to faith, to spirituality, to orthodox Christianity. On the other hand, the new philosophers treated such fearful men with scorn and little patience, viewing them as obstacles in the road to man's rightful domination of the earth which the new philosophy promised with increasing frequency. Milton, as a man involved in the intellectual world around him, could hardly fail to reflect, in some manner, this dynamic intellectual struggle.

In my research, neither my choice of theme nor of the central figure of Milton and his works have disappointed me. I have been led in an intellectual pursuit from Aristotle and Plato through Augustine to Bacon, Hobbes, Milton and, in an appropriately circular fashion, back to the initially inspirational figure of Bronowski. I have been challenged to consider not only the dichotomous relationship between art and science but also analogous dichotomies between faith and reason, liberty and license, authority and experience, the individual and society, the finite and the infinite. I have been given an opportunity to explore a history of thought and expression whose basic tenets and tensions have interested me since my earliest intellectual experiences and training. I shall always be grateful for this experience.

With this insight into my motivation in undertaking this project, I believe that I can proceed with the explication of the fruits of my research.

BACKGROUND

The Augustinian Legacy

Even a cursory reading of some of the new philosophers of the seventeenth century English intellectual landscape, such as Sir Francis Bacon or Thomas Hobbes, would encompass repeated references to the "Schools" and the infamous denizens of those institutions, the "Schoolmen." They are variously portrayed as useless drones who spin veritable spiderwebs of useless knowledge, as fractious old men who seek rather to raise contentions and quibbles over old and dead issues than to solve new and practical problems or as intellectual tyrants burdening the mind of man with the yoke of ancient authority. What all of these rather uncomplimentary portraits refer to are the practitioners of the Medieval discipline of Scholasticism.

Once considered the ultimate rational achievement of man on earth, the intellectual edifice of medieval Scholasticism was in a sad state of decay by the seventeenth century. Its spiritual basis in the Catholic Church under attack, its intellectual method challenged by the empiricists, its ancient authors scorned as obscurantists and branded as obstacles to progress by many educational reformers, Scholasticism clearly was a dying, if not already dead, intellectual creed. Yet, it had held sway in Western Europe for more than twelve hundred years and, even in its death rattle, it defined the intellectual battle which the empiricists sought to win. Clearly, some introduction into the history and accomplishments of Scholasticism is necessary to appreciate fully the philosophical revolution of the seventeenth century.

Scholasticism, intellectually and historically, has its roots in the Roman empire at the beginning of the Christian era (Pieper, p. 19). In many respects, the sociological and psychological climate of this age represents the ideal to which the Scholastic thinkers would harken back. In this period during the first three centuries after the birth of Christ, Rome enjoyed a preeminence, a sense of security and an organic unity never since rivaled. The great Caesars and their invincible legions had made the Mediterranean a Roman lake. With Greece and Carthage subdued and eventually assimilated into the Empire, there existed no sizable, organized threat to Roman hegemony. This physical security engendered, in a very real sense, a psychological security in which most citizens of the Empire and even the subject nations could rest secure.

This psychological security was rounded out and complemented by the intellectual diversity and scholarly eminence of the age. Rome, in its conquest of the Mediterranean world, did not destroy the intellectual fruits of the labors of its subject peoples. On the contrary, Romans went to great lengths to copy not only the arts and the useful sciences of their vanquished foes, but also the philosophies and even the esoteric religions of their newly integrated provinces. Aristotle, Plato, Socrates, Archimedes, Pythagoras, Plotinus and Plautus could be mentioned in the same conversation with Cicero, Terence, Catullus, Virgil and Lucan in the vast intellectual marketplace that was Rome in the three centuries after the advent of Christ. While the quality of its leaders and the physical vigor of the Roman citizen may have declined during this period, the material available for the intellectual life continued to expand and in some ways even improve. Thus, we see a Rome secure enough in its physical existence to tolerate and even encourage a wide diversity of thought.

In this atmosphere, Christianity was first tested in the crucible of initial persecutions and then nurtured with the aid of the Christian emperors. The early Christians reacted to the society in which they found themselves in the latter part of this era in a manner which was to give the psychological impetus to the scholastic phenomenon of the Middle Ages. Christianity, a religion built almost exclusively upon the conversion of the followers of other religions, placed the newly converted Roman citizen in a delicate dilemma in relationship to society at large. Ignoring the larger questions of spiritual life versus material life which form a major tension in Christian doctrine, let us concentrate on the more mundane and immediate question of the education of Christian youth.

The early Church Fathers felt the critical need for a Christian education for Christian youth. Above and beyond the fact that these same Fathers in their earlier pagan lives had generally received the best education that classical Rome had to offer, which would generally dispose them to value education for its own sake, it is easy to see the importance of such an education from a religious Christian's point of view. A religion, such as Christianity, which relies so heavily upon the Word of God, must develop disciples who can understand this Word for themselves so that they may believe, on the one hand, and proselytize, on the other. For citizens of the Roman Empire, this Word was transmitted by their Latin tongue, with perhaps a few of the more educated Church Fathers and many of its eastern practitioners expressing the Word in Greek. It is the instruction in this medium of language which posed an exquisite dilemma for the practising Christian (Cassidy, p. 162).

Classical education in Latin had, not surprisingly, relied almost exclusively upon Latin literature to provide pedagogic examples of Latin in

its most felicitous, effective and powerful form. This literature is filled not only with a morality distasteful to Christianity, such as Epicureanism, but it is peopled and animated with false gods and blasphemous episodes (Cassidy, p. 160). How does one educate Christian children, who represent the hope of a Christian future, in such a pagan atmosphere? The religious instruction that they receive in the home and in the church will be inevitably compromised by the methods of their pagan tutors. A Christian culture did not exist to replace the culture of the Roman Empire in all of its diversity and intellectual appeal. Furthermore, many of the Church Fathers had little desire to create such an edifice (Cassidy, p. 150). Many of the ideas of the pre-Christian pagans continued to have relevance for the early Christians. Certainly the mathematics and science of Pythagoras and Archimedes were practically useful. The Platonic concept of the good and of man's approach to the good acted as a buttress to many a Christian's faith. Clearly one answer to this dilemma was the creation of a Christian educational system, where the beneficial examples of Greek and Latin would be used to provide instruction in the classical areas of grammar and rhetoric, while the doctrines of the Christian Church would be the guide for the moral and religious instruction of the students (Cassidy, p. 174).

In many ways, this discussion of the intellectual diversity of the Roman Empire balanced against the educational needs of the early Christian Church can be epitomized in the person of the greatest of the early Church Fathers, St. Augustine, Bishop of Hippo. Augustine was born in the twilight of the Roman Empire in 354 in a small town in North Africa (Cassidy, pp. 139-140). His father was a pagan. His beloved mother, St. Monica, was a devout Christian who, though responsible for his upbringing, did not have him baptized. From an early point in his life, Augustine delved deeply into the

cultural and intellectual heritage of the Roman Empire. At Carthage, he completed his initial education with studies in rhetoric, law, philosophy and the other sciences being taught in this North African seat of learning. His studies prompted him to delve further into pagan philosophy in search of the truth in its entirety. Joining the Manichaeian sect in his search for truth, he left them nine years later after his questioning of a Manichaeian bishop on certain points of doctrine resulted in ambiguous and evasive answers. At this point, he left Carthage for Rome in hopes both of continuing more fruitfully his quest in search of truth and of advancing in the pedagogic career upon which he had embarked in North Africa. In Rome, he was disgusted by the sloth and dishonesty of his students and accepted a teaching position in Milan with alacrity.

In Milan, Augustine became acquainted with its Christian bishop, St. Ambrose. His sermons appealed to Augustine both intellectually and spiritually and clearly led to Augustine's conversion in 387. After his conversion, Augustine returned to his North African home where he was ordained in 391 and shortly thereafter succeeded to the bishopric of Hippo. For the next thirty-seven years, Augustine not only exercised primacy over the North African Church, where he was noted for his monastic piety, but also greatly influenced the church at large through his writings and through his correspondence with other important Christians throughout the Western world.

As a theologian, St. Augustine is most famous for and most influential in his teachings regarding the nature of divine grace. These doctrines were a direct outgrowth of his earlier search for truth before his conversion and, for Augustine, provide an end to the intellectual and spiritual strife which had dominated this search. Augustine recognized as the source of this strife his own will, an entity which he viewed as at the mercy of his sensual and

emotional impulses. The will could not be controlled or mastered by use of intellect alone. The failure in this respect of the various pagan philosophies which he had studied, and of Stoicism in particular, convinced Augustine of this fact. Only in the complete effacement of the individual will and in the submission to the omnipotent Divine Will did Augustine find spiritual solace (Cassirer, pp. 87-88). Augustine looked to St. Paul for his explanation of the nature and the working of this Divine Will. He constructed a dogma which affirmed the overriding power of the Divine Will, and the bestowal of Divine Grace upon certain men the election of God alone. It also affirmed the futility of trying to approach God and partake of Divine Grace through purely intellectual or rational means. As a result of his own subjective and exclusively personal experiences in his search for the truth, Augustine thus forms a dogma which will be applied to Christians at large as an immutable and unalterable principle by the Church which Augustine did so much to mold (Cassirer, p. 89).

Equally important, both from a theological and from a practical point of view, are Augustine's teachings regarding the authority of the Church. These teachings spring both from his dogma regarding divine grace and his own practices as a teacher. Human reason and human will have no place in Augustine's doctrine outlining the essential relationship between God and man; similarly, these same human characteristics have no place in man's relationship with the Church, God's image on earth and the guardian of the faith. The authority of the Church must remain unquestioned, unchallenged. Augustine's pedagogic principles, practically elaborated in his De Magistro, illustrate his emphasis on authority (Cassidy, p. 152). In this treatise, Augustine espouses many useful teaching techniques, all of which tend to emphasize the facilitating nature of a teacher in his attempt to lead his

student to an understanding of the subject matter. Nevertheless, Augustine affirms quite often the authoritarian nature of the teacher and the fact that, in some instances, the student will simply have to recognize this authority and accept teachings which may not be inherently comprehensible based upon faith in the teacher's authority. The application of this pedagogic principle to the Church at large can be easily seen. As the supreme teacher of the Christian faith to its communicants, the Church occupies a pedagogic position impregnated with authority.

Thus, in Augustine, we see a powerful synthesis of the psychology and cultural heritage of the Roman Empire with the spiritual truths of the Christian religion (Cassirer, p. 89). While appreciating the literature and culture of pagan Rome, and using the literary skills acquired in the study of this culture, Augustine rejects their use of reason in the approach to divine knowledge and wisdom. From this dogma, Augustine posits the authority of the Church which leads to the creation of a human organization approaching the Roman Empire itself in its power, authority and universality. Of particular importance is Augustine's dismissal of human knowledge and reason in general, and of knowledge acquired sensuously in particular, his unconditional assertion of the authority of the Church and his concomitant discussion of the ways and means of Christian education. It is upon this dogmatic base that the Scholastic edifice of the next millenium would be built.

If St. Augustine provided Scholasticism with its intellectual foundations, then the rapid disintegration of the Roman Empire during Augustine's lifetime provided Scholasticism with its sociological impetus and helped to form its institutions and mold its methodology. In their destruction of the Roman Empire, the barbarian hordes destroyed the political and cultural security which citizens of the Empire had enjoyed for five

centuries. Furthermore, they threatened to destroy, through their ignorance or apathy, the very basis of a civilization of which they had become the unlikely masters. The ancient literature, philosophy and sciences which conquering Rome had so carefully preserved received no similar lease on life from the barbarian overlords. All of these aspects of the disintegration of the Empire disconcerted Christians. Beyond the political calamity, which substituted a hostile or, at best, neutral barbarian hierarchy for the openly supportive Roman government, the Christians of the era were equally distressed by the threats to their culture and to their educational efforts.

Thus, Christianity was faced with a two-fold challenge: first, to preserve the learning of the ancients for their own educational purposes; and, secondly, to pass on the Roman culture, in what promised to be a long and tedious process, to their new barbarian overlords (Pieper, p. 22). In many respects, Christianity was well suited to undertake this task. It was coextensive with the old Empire, it possessed the scholars and intellectuals who consciously recognized the task at hand and understood its importance, and it espoused a particular life style which could provide the medium for this inter-generational and intercultural communication - monasticism (Pieper, p. 42). Monasteries were formidable fortresses of learning. They were quiet and conducive to study and to teaching. They were generally secluded from the secular world and thus protected to some extent from the ravages of war and plague. Finally, they were linked together by an overarching church hierarchy which could direct their efforts and ensure that the monasteries' physical seclusion did not lead to intellectual stagnation, at least not in the short run.

Monks of every order undertook this enormous task in monasteries throughout Europe, North Africa and the Middle East. They collected and

copied ancient manuscripts and taught promising youngsters the ancient wisdom. It was in these centers that Plato and Cicero, along with Plautus and Terence [for monks evidently appreciated humor in addition to the more purely philosophical tracts over which they labored], were preserved and it was from these centers that Christianity reached out to the barbarians with the promise of spiritual fulfillment and intellectual development. In these centers, Roman culture, Christian educational concerns, and Augustinian dogma were fused together into one intellectual discipline.

From Roman culture, the Scholastics adopted a technique of learning which emphasized language and literature. The classical Latin trivium of grammar, dialectic and rhetoric dominated the educational scene. The quadrivium of music, geometry, arithmetic and astronomy rounded out the seven liberal arts. The instruction was mainly oral, manuscripts being too valuable for mere didactic exercises, with heavy emphasis on oral technique and debate. From Augustine, they inherited an inviolable respect for authority in all of its forms, whether purely doctrinal or generally intellectual. And from their Christian orientation, they acquired the belief that all education only prepared a scholar for the study of theology, the contemplation of God. This last point is perhaps the most important, and it is generally the least understood by modern observers who peer back into the Middle Ages and its Scholasticism. There was no learning to speak of besides Christian learning, no philosophy besides Christian philosophy (Cassirer, p. 156).

In fact, to speak of "Christian philosophy" is, in an important sense, redundant. With the destruction of the Roman Empire, the Christian Church had compiled what was considered the sum total of knowledge available to civilized man. More work remained in terms of commentary and analysis, but, as far as medieval man could see, all of the raw material existed in the libraries of

the monasteries. With its monopoly on knowledge, education, and the intellectual life of the Middle Ages, the Christian Church was able to construct a great intellectual edifice in which there were no allowed contradictions, no unanswered questions and no perturbing puzzles. This rigid unity epitomizes the medieval Scholasticism against which Hobbes and Bacon railed.

The Renaissance and Humanism

Defining the end of the Middle Ages and the demise of Scholasticism are pursuits which have kept scholars and publishers busy for decades. All experts agree that after the Middle Ages came the Renaissance, but they quickly divide on the question of when and how this transition came to pass. In point of fact, there were several "renaissances" of art and learning during the Middle Ages. The court of Theodoric in Ravenna in the sixth century, the court of Charlemagne in France in the ninth century, the court of Pope Sylvester III in Rome in the tenth century are all examples of medieval "renaissances" (Dresden, p. 222). Yet, by the fifteenth century, the Renaissance with which modern man is most familiar has clearly taken hold permanently in the scholarly, literary and artistic centers of Europe. The transition from one era to the next is, in many cases, difficult to define and illustrate. Renaissance man owed a great deal to his Medieval ancestors. Yet, there are differences in the tone, attitude, psychology and intellectual focus of the Renaissance mind when compared with its Scholastic predecessor. We will explore these differences in broad terms in order to arrive at an acceptable appreciation of these contrasts.

Viewing Scholasticism as an intellectual movement which sought to preserve the fruits of ancient learning in the face of the barbarian onslaught and to aid in the education of a Christian Europe, it is clear that it had served its purpose by the beginning of the fifteenth century. The Germanic hordes that threatened society as it was known by the Christians of the fourth century had become civilized, if perhaps uneasy, co-religionists by the fifteenth century. Knowledge in general, and education in particular, were firmly in the hands of the Christian Church, and all thought was based in a

Christian matrix (Pieper, p. 152). Retaining the Scholastic methods, with their emphasis on almost monastic seclusion from the world at large and their dependence on the logical disputation of hypotheses centuries old, could only lead to stagnation and decay. To prevent this, new materials, new methods and new approaches were needed in the learned centers of Europe.

The Humanists of the Renaissance led the way in providing scholars with these new resources. They initiated this process by taking the Scholastic emphasis on language and transcending its narrow, didactic purpose. Humanists of the age engaged in massive hunts for new manuscripts in the monastic pigeonholes of Europe and the exotic libraries and marketplaces of Islam. Cicero, Livy and Tacitus, known to medieval scholars in fragmentary form, became available in their entirety. They learned Greek, and this literally opened new worlds of thought and literature for them, since the studies of the medieval world were limited to works written in or translated into Latin. Works of Plato and Homer were rediscovered by an admiring world. These discoveries were accelerated by the wealth and power of such Humanist patrons as Lorenzo de Medici and Pope Nicholas V. Under their aegis, the Humanist scholars provided new food to an intellectually starved Europe. (Dresden, pp. 18-21)

This new wealth of works presented the Humanists with an interesting challenge. Since they now often possessed the same work by the same author in two different languages, the proper interpretation of that author's meaning rested in large part in the hands of the translator. In addition, the clear differences in style and diction between the Latin of the Scholastics and the purer Latin of their classical forebears prompted an intense interest in the study of language itself. (Dresden, pp. 76-82) This had wide-ranging ramifications. The study of language used by various authors often led to a

Humanist interpretation of the author's meaning which differed violently from the Scholastic interpretation. Furthermore, this concentration on philology allowed scholars to study and question material heretofore held sacrosanct. As an example of the former phenomenon, the philological studies of the works of Aristotle led Humanists to reject Aquinas' synthesis of Augustine and Aristotle into a single edifice. The foremost example of the latter phenomenon was the extensive textual criticism of St. Jerome's Vulgate Bible. (Dresden, p. 78)

While this massive search for new manuscripts brought to light new works by recognized authors and provided the basis for extensive philological research and newly developed practices of textual criticism, it also unearthed new and strange works which excited the Humanists of the Renaissance. These works can be divided into the realm of mysticism on the one hand and science on the other. Among the mystic works, the so-called Hermetic and Cabbalistic literature held the most fascination for the Humanists. The hermetic literature is named for Hermes Trismegistus, an ill-defined but undoubtedly fabulous god related in some obscure way to the Egyptian god Thot, whom the Greeks identified with Hermes. (Dresden, p. 30) The hermetic writings comprise a hodge-podge of mystical revelation and "natural magic" which camouflages Hermes' divine doctrine which will lead infallibly to eternal happiness. The Cabbala represents the Hebrew mystical tradition. The Zohar ("The Book of Illumination") stands as a paradigm of cabbalistic literature. In it, Rabbi Simeon ben Jochai expounds to a gathering of students upon all of the actions and events on earth and in heaven, and while doing so supposedly outlines the whole canon of Jewish wisdom, beginning with Moses' messages from Mount Sinai. (Dresden, p. 33) The Humanists became interested in these works due to their interest in Hebrew, which in turn got its impetus from the

textual studies of the Bible, for which Hebrew is understandably necessary. While scornfully rejecting the Talmud and its Biblical interpretations, Humanists worked extensively with Jewish scholars in unearthing and commenting upon the works of the Cabbala. (Dresden, p. 32)

In discovering ancient works on science and technology, the Humanists exhibited their typical scrupulous attention to philological details. Particularly apt examples can be drawn from their treatment of ancient herbals and bestiaries. Humanist scholars attacked Pliny the Elder's thirty-seven volume Natural History with typical fortitude. Ermalao Barbaro (1454-1493) rivaled the original author in his commentary and annotations which sought to correct the ancient authority. Yet his corrections were not based on personal observations or even on contemporary data; he corrected Pliny by referring to other ancient authorities. For example, he corrects Pliny's assertion that elephants live for three hundred years by quoting Aristotle's edict that they lived instead for one hundred and twenty (Debus, p. 35) Humanist herbals displayed the same trait. They were simply exquisite editions of ancient herbals, with the differences between the ancient herbalists on various points scrupulously noted in the exhaustive commentaries which accompanied the principal text. These herbals contained few useful illustrations of the plants which they described; a curious deletion, given the extreme importance of herbal cures to the medicine of the era. (Debus, p. 43)

Similar traits can be discerned in the Humanist approach to medicine, and anatomy. In medicine, the great ancient authority was the Greek physician Galen (Debus, p. 55) Humanist researchers first concentrated on discovering and editing the purer versions of Galen to be found in the typical manuscript hunting grounds. Where factual errors occurred in Galen, errors which were pointed out by the exhaustive dissection techniques of such great anatomists

as Andreas Vesalius, these were corrected, alongside the corrections suggested by philological research. The reluctance of the Humanists to depart from ancient authority is vividly demonstrated by Vesalius' handling of the issue of human blood flow, one of the key medical questions of the age. Galen postulated what can be most simply described as a three loop blood flow network. The first loop, consisting of the liver, the veins, the right ventricle of the heart, and the lungs, distributed the tissue-nourishing natural spirits to the body and carried away wastes. The second loop mixed a small amount of blood from the right ventricle with air from the lungs to form the life-giving vital spirits which were distributed via the arteries. Finally, this arterial blood aided in the formation of the animal spirits in the brain which were distributed via the nerves. The key to this system are Galen's postulated pores in the septum of the heart dividing the right ventricle from the left ventricle. These pores do not exist. Even Vesalius could not discern them with his keen anatomical eye. Yet, he defers to Galen by marveling at the subtlety of nature, which could create these necessary pores through the densest and seemingly most solid muscles of the heart without making them evident to the human sense. (Debus, pp. 57-59)

When presented with this bewildering array of exotic mysticism, sound philological research and respect for ancient authority, one may rightly question humanism's distinction from scholasticism or its contributions to modern scientific thought or its ability to resist schizophrenia in the face of what appear, at least to modern minds, as utterly incompatible intellectual creeds. Or, one may simply succumb to a quite valid confusion. Perhaps one can begin to make some sense out of this Renaissance phenomenon by analysing the humanist proclivity to accept eagerly quite diverse philosophical systems and religious revelations in one tolerant embrace.

In large part, the broad-minded humanist tolerance is born out of their characteristic Neo-Platonism. One must always keep in mind the fact that Humanism received its initial impetus from the introduction of the study of Greek to the Italian Renaissance scholars. The first fruits of their philological labors were the complete works of Plato as translated from reliable Greek manuscripts. Of course, Plato had been known and admired before this event and the mere serendipity of the choice by the translators of Plato for their first works would not have ensured his later philosophical primacy among the Humanists in and of itself. What elicited their admiration and philosophical fidelity was the extraordinarily humane and religious portrait of Plato which emerged from these translations. Particularly important to these Humanists are Plato's descriptions of the soul and its inherent desire for the good. Man, no matter how depraved, still possesses the capacity for appreciating and striving for the good. As the ultimate good, Plato places God at the summit of his philosophy. Furthermore, it is God's love for the world, for his creation, which binds the cosmos together. (Dresden, pp. 24-30) The similarity of Plato's conception of God to that of the Christian God can be easily seen. Equally apparent are the differences between Plato's Ultimate Good and Aristotle's Unmoved Mover. Where Aristotle posits a purely static divine being who serves a mechanical purpose, Plato opposes an actively interested God who cares for his creation. These differences in tone, attitude, conception and function of the Divine Being in Plato and Aristotle point to their equally divergent theological epistemologies. Aristotle begins with sensory perceptions of the world around him and uses his reason to justify God on a physical basis. Plato views the material world with scorn, judging material objects to be imperfect manifestations of divine forms and ideas. He thus appeals to a supernatural

realm of knowledge and being to explain God. In Plato, the Renaissance Humanists, especially those of the Florentine School led by Pico della Mirandola and Marcilio Ficino, find a worthy philosophical opponent to Aristotle and especially to the purely rationalist exponents of Aristotle to be found under Pomponazzi at the University of Padua. (Dresden, p. 36)

The clear appeal of Platonic thought for even devout Christians supported a belief in the compatibility of almost all religions and philosophies with Christianity. Marcilio Ficino, building on the sentiment expressed by Eusebius, an early doctor of the Church who dubbed Plato "the Greek Moses," (Krailsheimer, p. 27) postulated one original Christian revelation whose manifestations are equally evident in both the Scriptures and the ancient philosophers. Thus, we are often presented with the spectacle of a Renaissance Humanist discussing a theological point and using not only Scriptural support, but also the thoughts and ideas of Plato, Moses, Pythagoras, the Hebrew Cabbalists, Mohammed and Zoroaster, often in the same breath. (Dresden, p. 11) In a sense, this tendency is an outgrowth of Scholastic traditions, where all philosophy was Christian philosophy and where an essential unity of thought and dogma existed in which all of Christendom could partake. But where Scholasticism created unity, either through the judicious editing of the early monks whose choice dictated which ancient authors would be preserved or through the monumental intellectual efforts of such men as St. Thomas Aquinas, Humanism assumed unity. Where Scholasticism sought rigid logic in its unified edifice and enforced it with often quibbling disputations, Humanism sought instead a common religious yearning and a similarity of tone in its collection of philosophers and excluded few from its companionship. This helps to explain, in large part, the potpourri of ideas and personalities to be found in humanist works.

A further result of Humanist studies resulted in a greater concentration on and appreciation of man and his endeavors. The focus of research and debate shifted from a medieval preoccupation with theology alone to a Renaissance exploration of both man's proper relationship to God and his proper role in human society. It is important to realize that this shift in focus is not as dramatic as it has been often depicted. Humanists did not make man the measure of all things; they remained devout Christians throughout and never discounted the importance of God in the cosmic scheme of things. It is easy to see how both the methods and the fruits of Humanism could lead to this shift of focus. The Humanist emphasis on philology stressed man's use of language. Ancient authorities were transformed from disembodied voices speaking from the past into men whose quality of thought depended on their language abilities and whose very message could be misconstrued or distorted by other men who determined to translate or comment upon their works. Their discovery of long lost scientific and historical works rather naturally focused attention on the material world in which man lived, while the wealth of works on ethics and morality written by the ancient pagans concentrated upon man's conduct in society in other than a Judeo-Christian religious context. If not the measure and the rule of the world, man certainly became an object worthy of study for its own sake and the fostering of right living a unique responsibility of every cultured man. (Dresden, pp. 67-70)

Thus, we can see that, in many ways, Humanism represents a logical outgrowth of Scholasticism. Encountering formidable amounts of newly rediscovered ancient texts, the Humanists sought to integrate them into the religious and philosophical system with which they were familiar. That they failed in the end to accomplish such a synthesis is not so much a sign of the vanity of their efforts as it is a testament to their broad-minded tolerance -

a tolerance which was soon to be banished by the sectarian strife of the Reformation. Despite their inability to create a new synthetic edifice to replace the rigid Scholastic one, they did succeed in changing the focus of thought and discussion from the pure sublimities of theology to the more mundane concerns of man and his environment. We will see all of these characteristics, dogmatic tolerance and concern with individual experience, manifested in a new and important way in Michel de Montaigne.

Montaigne - A Primer in Empiricism

In many respects, Michel de Montaigne represents Humanist ideals and precepts in the world of action. Educated in a fashion which would do any Humanist proud, Montaigne went on to lead a full and active life before retiring to the tower of his chateau to write his essays. This contrasts sharply with the lifestyle of many of the Humanist scholars whose ideas we have explored to this point. They were either cloistered in the haven of church monasteries or church governed universities, such as Cardinal Nicholas of Cusa, or they enjoyed the secure patronage of wealthy princes and prelates, as was the case with Marcilio Ficino or Pico della Mirandola. Through his combination of Humanist education and practical worldly experience, Montaigne continued the process of shifting man's focus from the divine to the mortal world which the scholarly humanists had initiated. In doing so, Montaigne elucidated practical principles of empirical knowledge which defined the agenda by which scientists, philosophers and poets would debate the questions raised by the empirical approach to life which dominated intellectual circles in the seventeenth century.

Montaigne's family background and early education provide key clues to his later thoughts and actions. Montaigne was born into a prosperous and respected noble family of the Perigord region of France in 1533. His father was the long time mayor of Bordeaux, the city which would form the setting for much of Montaigne's own professional and business life. Though not learned in a scholarly way, Montaigne's father recognized the importance of a classical education and often entertained the amateur philosophers with which his position would bring him into contact at his country chateau. This sincere acknowledgement of the centrality of education in the classics prompted

Montaigne pere to provide his son with a thorough and somewhat unusual primary education. Assigned a learned German tutor and raised among the servants of the household, Montaigne was brought up with Latin as his mother tongue until the age of six. From six to thirteen, he continued his education at college. Thereafter, he studied law and became a counsellor in the Parlement of Bordeaux at age twenty-one. Married at thirty-three, Montaigne became head of the family at thirty-eight upon the death of his father. At that point, he retired to the tower of the family chateau to begin writing the works which would attempt to describe his observations, habits, thoughts and philosophy. (Woodberry, pp. 150-152)

During those most active years from thirteen to thirty-eight, Montaigne did not simply rest content in the provincial center of Bordeaux. Like many of his noble contemporaries, he engaged in a series of youthful adventures which broadened his horizons and added to his precious store of experiences. He knew the life of the soldier, participating in sieges and riding extensively in the endless summer campaigns of the sixteenth century. He visited Paris and tasted the richness of the court, dabbling appropriately in the intrigue, debauchery, gaming and adventure. He assumed a leading position in the administration of Bordeaux, one which was natural for a man of his talents and background. Through all of this whirl of activity, Montaigne passed with notable equanimity and a marked talent for coexisting amicably with people of all temperaments and creeds, whether philosophical or religious. A staunch personal Catholic and a convinced loyalist, Montaigne did not let these personal beliefs act as barriers between himself and the world around him. (Woodberry, p. 153)

After his "retirement," Montaigne pursued interests and activities which were far from sedentary. Such a totally passive life would have been

unthinkable anyway for a distinguished citizen such as Montaigne in the political and religious whirlwind which was sweeping through the France of the era. The fact that Montaigne passed through this tumult with his fortune and his reputation largely intact is a tribute more to his equanimity than to his lassitude. In particular, Montaigne's retreat to his country estate was broken by his journeys to Italy in his forty-seventh year. Taken up as a measure to combat the kidney stones with which he was lately plagued, Montaigne also viewed it as an opportunity to view the impact of his recently published "Essais" and to learn something of the Italian culture and society. For eighteen months, Montaigne journeyed throughout Italy, visiting nobles and following no fixed itinerary. Again, his readiness to accept all manner of experiences stood him in good stead, allowing him to partake fully of the novel atmosphere inherent to traveling without being blinkered by his own cultural biases or prejudices. (Woodberry, pp. 154-156)

His travels were interrupted by the news of his election to the mayoralty of Bordeaux. Returning leisurely, Montaigne began an administration noted for its moderation and integrity, so much so that he was re-elected to an unusual second term. Relinquishing his office with the same equipoise which characterised his whole life, Montaigne declined to return to the plague-stricken city to preside over the installation of his successor. Throughout these periods, Montaigne kept working at his own literary creation - the essay. Through this medium he hoped to distill the most important aspects of his own experiences in the hope of coming to a better understanding of himself. (Woodberry, p. 157)

The development of Montaigne's thought, shows clear changes in attitude and philosophical orientation. Pierre Villey, in his landmark analysis "Les sources et l'évolution des Essais de Montaigne" documents these changes and

divides them into three distinct phases. The first phase, described as Montaigne's stoical period, lasted from his retirement in 1571 to 1574. In the essays of this period, Montaigne argues for self-mastery in the face of life's vicissitudes and ills, rather after the pattern of Seneca and Plutarch and clearly under the influence of his friendship with Estienne de la Boetie. In 1576, Montaigne entered what Villey describes as his "skeptical crisis." This turn of mind is epitomized by Montaigne's striking of a medal with the motto "What do I know?" Throughout the essays of this period, Montaigne analyzes and critiques the possibilities and the limits of human knowledge. In his final phase, his "Epicurean" phase, Montaigne concerned himself with the discovery of nature as it is found in us and exhorts his readers to follow this nature. In the essays written during this period, which extends from 1578 to 1592, Montaigne consciously seeks out laws of his own nature and presents them as typical of mankind at large. In these essays, the equanimity and moderation which constituted Montaigne's public actions become the keynotes of his thought. (Frame, pp. 5-6)

While this division into intellectual periods is interesting and useful, it is important to realize that Montaigne's development is gradual and that the resulting corpus reflects an organic intellectual creation. What Villey terms the stoicism and skepticism evident in his earlier works remains in a slightly modified form in his later works. In part, this development is a natural result of Montaigne's studious retirement, where he transcends the influence of his friendship with La Boetie, whose espousal of such causes as the abolition of the monarchy indicates the distance of his own temperament from that of Montaigne. (Woodberry, p. 154) Throughout his life, his intuitive grasp of who he is never changes, though insights and opinions into his varying nature and appetites may change. (Frame, pp. 8-9)

Beyond this aspect of permanence, Montaigne quite piously accepted the permanence and power of God, as expressed in Catholic dogma. For a man living in the religious tumult prevalent in the France of the late sixteenth century, Montaigne exhibits all the caution of the archetypically prudent man when dealing with religious issues. Yet, this reticent caution which is characteristic of Montaigne's instinct for cooperation and of survival does not in any way dilute or jeopardize his orthodox piety. Montaigne looked to God as his ultimate symbol of permanence and eternity in this world of transience. His skepticism regarding human knowledge and reason acted to buttress his faith in God and, in fact, acted to separate God from the apprehension of man in a manner strikingly similar to that of Augustine. Only through God's grace can man enter into an understanding of the Divine Mystery and the truths which it subsumes. Man is left only to accept the actions of the Deity in his everyday life. (Frame, p. 9)

While none of Montaigne's ideas, taken in isolation, is novel or revolutionary, his method of acquiring and internalizing them is unique among Renaissance Humanists. Equally important, the manner in which he chose to share his thoughts with his friends and readers signals a bold departure from intellectual rut of the Scholastic past. Montaigne's "Essais" began originally as a glorified version of what was known in the Renaissance as a commonplace book. In Montaigne's case, his version of the commonplace book was heavily larded with quotations from the authors which dominated his reading during his early retirement, with the addition of Montaigne's own conclusions and the support of relevant personal experiences (Frame, p. 5) The nature of his entries soon changed, however, with Montaigne's own life experiences quickly becoming the focus of each "essai" [literally, an attempt], with erudite highlights drawn from Montaigne's favorite classical

authors. In subject matter and focus, therefore, we can detect a distinct change from both Scholastic and Humanistic treatises. Here we have a well-educated and decidedly contemplative Renaissance gentleman who finds his own actions, experiences, appetites and emotions worthy of serious consideration in and of themselves. The wisdom of the ancients, while illuminating, does not represent the only light of knowledge for Montaigne in his essays.

In style no less than subject Montaigne breaks new ground. He blithely ignores Scholastic standards of dialectic reasoning and argument in his writings. While a Scholastic treatise states the contention or question which it promises to resolve and then sets about the task in a rigidly logical and aggressive manner, seeking to overcome its adversaries by the force of its dialectic if not by the compulsion of its ideas, Montaigne simply expresses his thoughts and observations in a casual, relaxed manner, drawing conclusions, of course, but letting those conclusions bear the brunt of his readers' scrutiny without relying upon bombast or polemic as a prop. In his essays, he often shifts from one topic to another with startling abruptness - leaving the derailed train of thought to fend for itself while he goes on to pursue a more appealing idea on a different track. Throughout his literary peregrinations, he embraces all topics as worthy of his consideration and commentary. Thus, a reader of Montaigne often learns more of Montaigne's attacks of kidney stone or of his sexual life than he perhaps cares to know. But, if one is not shocked by such discussions, they represent the refreshing atmosphere engendered by Montaigne's style - a style which concretely symbolizes the extent of Montaigne's break with the Scholastic past.

Given this background discussion of Montaigne's approach to his self-ordained course of study, we can better appreciate Montaigne as he

expressed himself in his "Essais." Perhaps the best example of his thought can be found in his essay "Of Experience." The last work in Montaigne's final volume of essays, "Of Experience" perhaps represents Montaigne's final, or at least his most highly developed, exposition on the empirical approach to the world for which Montaigne stands credited as the modern intellectual father and ceaseless apologist. Pithy, highly readable and delectably quotable, it contains many passages which reveal Montaigne's thought and temper in so forthright a manner as to preclude the necessity for commentary. Given this quality, I will in the main relinquish the floor to Montaigne himself and only seek to organize his principles and place them in their proper historical perspective.

Montaigne's fundamental philosophical assumption can be found in the following quotation:

Wisdom is a complete and substantial structure, each part of which keeps its place and bears its mark. "Wisdom alone is contained wholly within itself." --Cicero (Montaigne, p. 554)

This core element of Montaigne's thought is a clear inheritance from both his Scholastic and Humanist predecessors, who also believed in the integral nature of the truth, no matter how they defined the truth. But, Montaigne considers man's ability to perceive this monolith as woefully handicapped.

Never did two men judge alike on the same matter; it is impossible to find two opinions exactly agreeing, not only in different persons, but in the same person at different times.

(Montaigne, p. 543)

Men do not realize the infirmity of their own mind; it does nothing but ferret and hunt around, incessantly wheeling about contriving, involving itself in its own work, like a silkworm, and there suffocating. "A mouse in a barrel of pitch."--Latin proverb (Montaigne, p. 543)

Given this handicap, reason which, when ideally applied, should be man's guide to the acquisition of knowledge requires the assistance of earthly experience. Even when both of these resources are drawn upon by the seeker of wisdom, the results may be less than satisfactory.

There is no more natural desire than the desire for knowledge. We try all ways that may lead us to it. When reason fails we resort to experience . . . which is a more ineffectual and less worthy means. But the truth is so great a thing that we should despise no means that may lead us to it. Reason has so many shapes that we know not which to lay hold of: experience has no fewer. The inference we try to draw from the likeness of events is uncertain, because they are always unlike.

(Montaigne, p. 590)

Given the nature of wisdom and the relative values of the two tools which man may use to acquire wisdom, Montaigne presents his own life and his own nature as the store of experiences from which he will draw his conclusions.

I study myself more than any other subject; that is my Metaphysics, that is my Physics. (Montaigne, p. 549)

I would rather know myself well by studying myself than Cicero. The experience I have of myself I find sufficient to make me wise if I were a good scholar. (Montaigne, p. 550)

Having so long and attentively studied myself, I am also qualified to form a passably good estimate of others; So from the outer manifestations of my friends I discover their inner natures. (Montaigne, p. 553)

In studying himself, Montaigne discovers both the nature of the world around him and the limitations inherent to human comprehension. His own experience shows him the depth of his ignorance, the failings of his reason, the folly of his passions and the limitations of his physical being.

In looking to himself and his own experiences as a font of wisdom, Montaigne displays scorn and ridicule for the commentators and researchers of the Scholastic world.

We should blot out all traces of these innumerable differences of opinion, instead of using them to show off our learning and swelling the heads of posterity with them. I know not what to say to it, but experience tells us that so many interpretations disperse the truth and destroy it. (Montaigne, p. 542)

Who would not say that glosses increase doubt and ignorance, since there is no book about which the world busies

itself, whether of human or divine origin, of which the difficulties evaporate by interpretation? The hundredth commentator hands it on to his successor, more knotty and slippery than the first had found it. (Montaigne, p. 543)

It is more of a business to interpret the interpretations than to interpret the things, and more books have been written on books than on any other subject; we do nothing but gloss one another. (Montaigne, p. 544)

Seemingly, the infirmities of human reason simply compound one another when men seek only to analyze the works of other men, when man removes himself from "things." This is a germinal idea in the development of empiricism - the emphasis on the contemplation of "Things" will soon grow in importance.

These philosophical beliefs and assumptions of Montaigne are paralleled very closely by his religious thought. Similar to Montaigne's conception of knowledge, his God is integral, ubiquitous and omnipotent. Equally important, he is approachable neither through the examination of human experience, which Montaigne champions throughout this essay, nor through the exercises of reason.

In this universe of things I allow myself to be ignorant and carelessly guided by the general law of the world. I shall know it well enough when I feel it. My learning cannot make it alter its course. It will not modify itself for my sake. It is folly to expect it, and greater folly to be disturbed about it, since

it is necessarily the same for all of us. The goodness and capability of our Pilot must relieve us fully and absolutely from all anxiety about steering.

(Montaigne, p. 549)

Simply by submitting mindlessly to the dictates of God's will, which Montaigne affirms will become manifest when he feels it, and trusting him to make things come out right in this confusing and contradictory world, Montaigne bears witness to his religious beliefs.

Recapitulating, we have seen Montaigne's beliefs concerning the nature of Wisdom and of God, the limited ability of man to attain a perfect understanding of either, the importance of direct human experience in helping man obtain the understanding within his grasp and his disdain for Scholastic quibbling and glossing. Given these beliefs, Montaigne reaches a quite distinctive conclusion as to the proper purpose and goal of man's life on earth: To seek Nature and to follow it. Having observed so many contradictions in the Nature of his own experience, Montaigne functionally equates nature with moderation and with the endeavor to reconcile these opposites. While there are many passages which reflect this thought, the following does so in a most typical manner:

Philosophy appears to me to be very childish when she rides the high horse, and preaches to us that it is a barbarous alliance to marry the divine with the earthly, the reasonable with the unreasonable, the severe with the indulgent, the honest with the dishonest; that sensual pleasure is a brutish thing, unworthy to be enjoyed by the sage; that the only

pleasure to be derived from the enjoyment of the fair young bride is the conscientious pleasure of performing an orderly action, like putting on one's boots for a business ride. May her followers have no more right or nerve or sap in ravishing their wives than in learning her lessons!

(Montaigne, p. 597)

For Montaigne, there truly is a time for all purposes under heaven. We must strive for that moderation, that balance, that proportion, that harmony which is manifest in the world around us.

What cannot be cured must be endured. Our life is made up like the harmony of the world, of contrary things, also of different notes, soft and loud, sharp and flat, high and low.

(Montaigne, p. 569)

It is our duty to compose our character, not to compose books, and to win, not battles and provinces, but order and tranquillity for our conduct of life. (Montaigne, p. 591)

Greatness of soul consists not so much in soaring high and in pressing forward, as in knowing how to adapt and limit oneself.

(Montaigne, p. 594)

For Montaigne, the Renaissance Humanist involved in the world, life is defined by the yardsticks which Nature provides and governed by a rhythm which we can feel and experience in our daily lives. Thus, by heeding our experience and making it the basis of our investigation into the world around us, we become

better able to construct our character and conduct our affairs. For himself, his motto, delivered to his fellow citizens of Bordeaux upon his assumption of the mayoralty, reflects his own careful examination of his experiences:

. . . what . . . to expect of me - no memory, no vigilance, no experience, no vigour; but also no hatred, no ambition, no avarice, and no violence. (Quoted in Woodberry, p. 156)

The Scientific Propagandism of Francis Bacon

At this point, it's worthwhile to take a step back and review the progress made in the history and philosophy of thought from Augustine to Montaigne. In Augustine and his Scholastic successors, we find philosophy inextricably intertwined with a religious doctrine which denigrates and rejects both human reason and human experience as methods for apprehending the greatest of all truths - the mysteries of the Christian religion. The Humanists of the European Renaissance approached the subject of knowledge and learning from another direction. Accepting the dogma of the Church and never directly addressing the question of faith versus reason, they concentrated instead on rediscovering the lost knowledge of the ancients and the occult teachings of Hermeticists and Cabbalists. They united all of these disparate philosophies under the doctrines of the Catholic Church more through a spirit of philosophic tolerance than through a rigidly logical synthesis in the manner of St. Thomas Aquinas. Their emphasis on translation and philology subtly shifted the focus of human learning from the ethereal sublimities of theology to the more mundane concerns of human life. Montaigne epitomizes the Humanist spirit in action. Accepting Catholicism without question as a given in his own life, he proceeds to concentrate on his own experiences and on the refinement of a way of life and a personal character rooted in an almost wholly secular matrix.

So far, these developments had been evolutionary. All of these intellectual debates had been conducted under the aegis of the Catholic Church, which had to this point exhibited a certain tolerance towards the divergence of views regarding philosophy as long as the basic tenets of Christianity were held inviolate. The intellectuals, having been educated

almost exclusively in the institutions created by the medieval Church for the development of Christian youth, uphold these tenets quite picusly. The shift in intellectual focus detailed above was not consciously established as a goal of philosophy nor is its development consciously hailed as a replacement for the institutions or intellectual methods of the Catholic Church. In the works where the study of man and his environment is predominant, it is often justified by the Renaissance construct of the microcosm. In this concept, man and his environment are viewed as miniature reproductions of the universe at large. Events and phenomena in the universe at large are mirrored in the body, mind, and soul of man. Manifestations of this belief in the thought of the Renaissance are legion. For example, plants whose leaves or roots resembled the organs or limbs of man were thought to have curative powers over those organs. A more familiar example can be found in the practice of astrology which, until the end of the seventeenth century, enjoyed a reputation as a serious intellectual pursuit. Astrology posits that the events in the cosmos have a direct effect on the lives of individual men on earth. Viewed in terms of the macrocosm-microcosm principle, this practice seems perfectly credible, though quibbles may be raised about questions of particular interpretations or astrological methods. Thus, the interest exhibited in the life and environment of man received a solid theological grounding through the application of the microcosm-macrocosm principle, preserving, at least externally and perhaps superficially, the supremacy of theology and of the doctrines and authority of the Catholic Church.

The whole intellectual foundation shifted with the advent of the Reformation. With the Protestant attacks on the authority and doctrinal supremacy of the Catholic Church came a general rejection of intellectual authority in all of its forms. Specifically, this meant an attack on

Scholasticism proper, which held as sacrosanct the authority of ancient philosophers and Church Fathers. Henceforward, neither the methods nor the conclusions of the Schoolmen possessed any validity for the "new philosophers," especially in the Protestant countries of Europe. The Catholic Church, in its fearful and forceful reaction to the Reformation, exacerbated this rejection of its authority and the methods of its Scholastics. To counter the threat of heresy it became even more dogmatic and intolerant. The Spanish Inquisition, the burning of Giordano Bruno, and the house arrest of Galileo all represent actions which would lead to the rejection of theology, in all of its forms whether Protestant or Catholic, as the linchpin of learning. Finally, the Reformation by its very nature helped to usher in empiricism, as embodied in the reliance upon experience for the acquisition of knowledge. Protestantism, in its most basic form, exhorts its practitioner to rely upon his own individual reading of the Bible, coupled with the grace and revelation which God freely imparts to him, as the means of knowing God and achieving salvation. With religion paving the way, it is an easy step to the application of the empiric method to intellectual disciplines besides theology.

Given, on the one hand, the evolutionary shift in the focus of learning from theology to man which was nurtured in the bosom of the Catholic Church and, on the other hand, the changes in the intellectual foundation of Europe wrought by Reformation Protestantism, the stage is set for a conscious and revolutionary rejection of the approaches of the past and announcement of a new intellectual plan for the future. Francis Bacon, the Viscount St. Albans, boldly ventures such a revolutionary manifesto. The younger son of Sir Nicholas Bacon, the Lord Keeper of the Seal in Queen Elizabeth's

administration, Francis received his college education at Cambridge, where he acquired his initial distaste for Scholasticism, and was later admitted to the bar. Brilliant and ambitious, with interests both in politics and natural philosophy, Bacon wasn't given his opportunity to excel until the accession of James I. Under James' administration, Bacon served successively as Solicitor-General, Attorney-General, Privy Councillor, Lord Keeper, and Lord High Chancellor. At the height of his power, he was second only to the king. As a result of James' difficulties with Parliament, Bacon was arraigned on charges of bribery. Pleading guilty, he was stripped of his offices. Retiring to private life, Bacon engaged in extensive experimentation and indulged his interest in philosophy, long held in abeyance by his public career. He died in 1626 of pneumonia contracted as a result of his experiments dealing with refrigeration in the snow. (Witherspoon, pp. 38-39)

In Francis Bacon, we find a conscious emphasis on man and the value of his experience, coupled with an intellectual rejection of the whole Scholastic edifice, both methods and results. In doing so, Bacon stands out as the first propagandist for what we consider to be modern science and typifies the "new philosophy."

The core of Bacon's thought can be found in his chef d'oeuvre, the Instauratio Magna, in which he seeks to place the whole of man's search for knowledge on a different footing. This ambitious work consists of an introductory treatise "On the Advancement of Learning," coupled with an outline of the work, a "Novum Organum, or True Suggestions for the Interpretation of Nature," where Bacon outlines his methods and his plan for the scientific exploration of the future, all of which is followed by numerous individual scientific treatises which Bacon had investigated himself. In the

Instauratio Magna, several key principles of Bacon's new philosophy can be discerned.

Bacon's most important tenet states that the proper function of philosophy is to give man power over his environment. In the preface to his Novum Organum, he states:

On the state of Learning - That it is neither prosperous nor greatly advanced, and that an entirely different way from any known to our predecessors must be opened to the human understanding, and different helps be obtained, in order that the mind may exercise its jurisdiction over the nature of things.

(Bacon, p. 334)

Thus, philosophy or learning has as its proper end human sovereignty over the earth. No more revolutionary change in direction and attitude can be conceived for philosophy. Even Montaigne, who interested himself almost exclusively in his own experiences, was content to submit himself uncomplainingly to the whims of the Nature which he so assiduously sought to follow. Bacon concerns himself with the principles of nature and their beneficial effects for man. Bacon even goes so far as to state that knowledge which promises no useful human end does not deserve the true philosopher's interest:

. . . nor do we think that peculiar abstract opinions on nature and the principles of things, are of much importance to men's fortunes. . .

We bestow not our labor on such theoretical and, at the same

time, useless topics. On the contrary, our determination is that of trying whether we can lay a firmer foundation, and extend to a greater distance the boundaries of human power and dignity.

(Bacon, p. 366)

For Bacon, above all else, true knowledge yields power.

Once this first principle of knowledge and philosophic exploration is accepted, Bacon then takes the small and easy step of repudiating the methods of the philosophers that preceded him, from Aristotle through the Scholastics down to the recent Renaissance Humanists. In the Novum Organum Bacon enumerates their efforts with succinct scorn:

It [the present state of knowledge] is barren in effects, fruitful in questions, slow and languid in its improvement, exhibiting in its generality the counterfeit of perfection, but ill filled up in its details, popular in its choice, but suspected by its very promoters, and therefore bolstered up and countenanced with artifices.

(Bacon, p. 335)

Bacon is no less succinct in his appraisal of the cause of the barrenness of science to date:

So that these four causes concurring, the admiration of ancient authors, the hate of the schoolmen, the exact study of languages, and the efficacy of preaching, did bring in an affectionate study of eloquence and copie of speech, which

then began to flourish. This grew speedily to an excess: for men began to hunt more after words than matter; and more after the choiceness of the phrase, and the round and clean composition of the sentence, and the sweet falling of the clauses, and the varying and illustration of their works with tropes and figures, than after the weight of the matter, worth of subject, soundness of argument, life of invention, or depth of judgment.

(Witherspoon, p. 20)

Here, Bacon cites the medieval reverence for ancient authority, Humanistic philology and the homilitic exigencies of the Reformation for the decline of science. No more striking and sweeping repudiation of the past can be imagined. This passage also brings to light Bacon's rejection of the pure reasoning of the mind as a basis for scientific exploration. The primary fault of previous philosophers was their severe introspection, in which the mind feeds upon itself in arriving at a description of the natural systems of the universe. As Bacon aptly states:

For the wit and mind of man, if it work upon matter, which is the contemplation of the creatures of God, worketh according to the stuff, and is limited thereby; but if it work upon itself as the spider worketh his web, then it is endless, and brings forth indeed cobwebs of learning, admirable for the fitness of thread and work, but of no substance or profit.

(Witherspoon, p. 52)

As an aside, it is interesting to note that, despite his visible scorn for the affectionate study of language, Bacon tries his hand at an occasional trope himself. Yet, this particular analogy is important to note for it characterizes the typical modern response to medieval learning of all kinds, at least at an emotional or subliminal level. Clearly, Bacon views the learning of the past, both in its methods and in its results, as failures to be shorn by modern progressive society as quickly as possible in order to secure the dominion of man over the earth. While these failures were manifest in numerous ways and could be attributed to many intellectual and social causes, the wellspring of their ineffectiveness is clear - the neglect of the study of things, of matter, of experience, of the creatures of God.

Again and again, Bacon brings this point home to his readers. If one word is repeated noticeably in the Instauratio Magna it is the word "things." Bacon is obsessed with the study of things. In order to tempt the secrets of nature from these "things" which hold them locked tight as a sacred patrimony, Bacon proposes a new method for philosophical study. Unlike Montaigne, who was quite willing simply to let experience wash over him in wave after inscrutable wave, Bacon seeks to distill meaning and concrete principles of nature from experience. Despite his optimism, which precludes any firm skepticism, and his disdain for the schoolmen, he recognizes the feeble and inconstant power of our senses and our reason and the necessity for a system for dealing with experience and organizing it into a meaningful construct. To provide these helps for the human mind, Bacon proposes a system of experimental investigation coupled with an inductive approach to organization of data and discovery of natural laws. Bacon's ideas about scientific experimentation are quite modern. They reflect a keen awareness of the limitations of human senses and of the psychology of awareness:

. . . the mind when affected by things through the senses does not act in the most trustworthy manner, but inserts and mixes her own nature into that of things, whilst clearing and recollecting her notions. (Bacon, p. 340)

But by far the greatest impediment and aberration of the human understanding proceeds from the dulness, incompetency, and errors of the senses; . . . the entire operation, therefore, of spirits enclosed in tangible bodies is concealed and escapes us.

(Bacon, p. 348)

To mitigate this unavoidable feebleness, Bacon proposes a fixed and steady program of experimentation and displays great faith in its efficacy:

There are two faults of the senses: they either desert or deceive us . . . to encounter these difficulties, we have everywhere sought . . . helps for the senses: and that not so much by means of instruments, as by experiments.

(Bacon, p. 339)

Nor can any substitution or compensation of wit, meditation, or argument . . . supply the place of this labour, investigation, and personal examination of the world.

(Bacon, p. 340)

. . . the nature of things betrays itself more by means of the operations of art than when at perfect liberty.

(Bacon, p. 341)

In every new and rather delicate experiment, although to us it may appear sure and satisfactory, we yet publish the method we employed, that, by the discovery of every attendant circumstance, men may perceive the possibly latent and inherent errors, and be roused to proofs of a more certain and exact nature, if such there be. (Bacon, p. 341)

The central importance and the ultimate faith in the value of results experimentally obtained - concepts which help form the core of modern science - can all be found in Bacon's thought.

To organize and analyze experimental results, Bacon chooses induction. On the surface, this choice reflects a disdain for the notorious deductive reasoning of the ancient authors and their Scholastic followers (a logical tradition which was to gain even more odious reputation through the casuistry of the Jesuits of the Counter Reformation). (Krailsheimer, pp. 33-34) But, more importantly, it also reflects Bacon's insight into the psychology of reason. Bacon recognizes and artfully expounds upon the prejudices imprinted into our rational processes by the nature of the mind (referring back again to the delusions of the senses), the semantics of language and the legacy of the dying philosophy. He further points out the preference of the mind for abstraction, simplicity and universality of natural laws, which results in man anticipating laws which do not really exist and then forcing nature to fit those hypotheses, doing considerable damage to the progress of science.

Induction, which seeks to build up numerous examples of nature at work and only then allow for an interpretation of these natural phenomena, will act as a countervailing weight for the easily misled reason:

We must not then add wings, but rather lead and ballast to the understanding, to prevent its jumping or flying, which has not yet been done; but whenever this takes place we may entertain greater hopes of the sciences. (Bacon, p. 362)

With his intricately dovetailed system of experimentation and inductive reasoning Bacon succeeds, at least in the realm of science, of uniting reason and experience into a forged tool of immense power and subtlety. It is this creation, this synthesis which Bacon viewed as his principal contribution to science:

And we think that . . . we have established forever the real and legitimate union of the empiric and rational faculties, whose sullen and inauspicious divorces and repudiations have disturbed every thing in the great family of mankind.

(Bacon, p. 337)

Bacon has cleared the true path to knowledge which his successors can follow to gain more insight into the principles of the natural world. Bacon notes that the plan of his work is deliberately open-ended; while he describes the experiments on which he has embarked in the later books, he realizes that he will not be able to elaborate the whole of natural philosophy, that he will have to leave that task to posterity. But, if they follow the true path,

Bacon will rest assured that the truths of nature will be cajoled from the mute "things" of the world by the assiduous and thoroughgoing worker bees of the scientific future.

Allied with his synthesis of reason and experience is Bacon's conviction of an organic and fundamental unity of all of the sciences. Again, he uses one of his more vivid and effective tropes to convey the point fully:

. . . the strength of all sciences is, as the strength of the old man's faggot, in the bond. For the harmony of a science supporting each part the other, is and ought to be the true and brief confutation and suppression of all the smaller sort of objections; but, on the other side, if you take out each axiom, as the sticks of the faggot, one by one, you may quarrel with them and bend them and break them at your pleasure. . .

(Witherspoon, p. 53)

Science, then, like medieval learning, forms an interlocking edifice, built on different foundations, perhaps, but still integral.

This passage also subtly directs our attention to the role which Bacon filled best and for which he will be remembered - that of a propagandist for science. The "new philosophy" which he espoused was clearly not yet established as the proper course for the future intellectual exploration of the world around us. Thinkers like John Donne expressed outright fear and loathing for it. Empiric prophets like Montaigne offer no real program or system for dealing with the wealth of experiences afforded us in our daily lives, though they do realize their importance in the development of a lifestyle and a character. The efforts of radical materialists, both

scientific like Newton and philosophical like Hobbes, lack the imprimatur of a valid intellectual endeavor. Bacon serves to deal with all of these concerns. He does so using his characteristic understanding of human psychology. In the passage cited immediately above, he calls for a scientific solidarity which will withstand the many criticisms which it will draw. It is echoed in the following passage which laments the scientific contentions of the past as detrimental to the advancement of learning:

So as it is not possible but this quality of knowledge must fall under popular contempt, the people being apt to contemn truth upon occasion of controversies and altercations, and to think they are all out of their way which never meet.

(Witherspoon, p. 53)

To counter these criticisms and to cultivate the approval of "the people," Bacon consciously seeks a middle road, a typical moderate approach which is often mirrored in his choice of images. Of course, the very method of uniting reason and experience tends to aid in this process of popular acceptance. In other areas, Bacon consciously eschews extremes:

Another considerable evil is, that men in their systems and contemplations, bestow their labor upon the investigation and discussion of the principles of things and the extreme limits of nature, although all utility and means of action consist in the intermediate objects. Hence men cease not to abstract nature till they arrive at potential and shapeless matter, and still persist in their dissection, till they arrive at atoms;

and yet, were all this true, it would be of little use to advance man's estate. (Bacon, p. 352)

Those who have treated of the sciences have been either empirics or dogmatical. The former like ants only heap up and use their store, the latter like spiders spin out their own webs. The bee, a mean between both, extracts matter from the flowers of the garden and the field, but works and fashions it by its own efforts.

(Bacon, p. 362)

Here, too, we may again repeat what we have said above, concerning the extending of natural philosophy, and reducing particular sciences to that one, so as to prevent any schism or dismembering of the sciences; without which we cannot hope to advance.

(Bacon, p. 364)

Bacon thus strikes a mean - seeking that moderate way which will win to experimental science the converts which it needs to flourish.

Bacon's propagandism uses other techniques in its bid for the heart, mind and soul of the intellectual man. He consciously seeks to uphold the reputation of the ancients. On the one hand, he decries the excessive authority vested in them by the Scholastics, saying that glorification of such well-springs of knowledge as Aristotle prevents man from rising above their wisdom. On the other hand, clearly the ancients, while their methods were often flawed and their results suspect, form a tradition of searching for the truth which can inspire and sustain the modern scientific explorer:

. . . and as for the overmuch credit that hath been given unto authors in sciences, in making them dictators, that their words should stand, and not counsels to give advice; the damage is infinite that sciences have received thereby . . .

(Witherspoon, p. 54)

. . . that it is our good fortune . . . for the sake of extinguishing and removing contradiction and irritation of the mind, to leave the honour and reverence due to the ancients untouched and undiminished, so that we can perform our intended work, and yet enjoy the benefit of our respectful moderation.

(Bacon, p. 344)

Bacon carefully sidesteps the raging battle between the ancients and the moderns by revering the ancients as counsellors whose force of intellect commands respect, while humbly forwarding his new system for scientific exploration which will shortly render the ancient systems manifestly obsolete.

A more important and more lasting technique to which Bacon resorts is the simultaneous segregation and secularization of scientific pursuits. In his discussion of the differences between ancient and modern systems of learning Bacon draws a crucial distinction between two types of learning and assigns them their respective spheres of influence:

For we do not deny that the received system of philosophy, and others of a similar nature, encourage discussion, embellish harangues, are employed and are of service in the duties of the professor, and the affairs of civil life.

Let there exist then . . . two sources, and two distribu-

tions of learning and in like manner two tribes, and as it were, kindred families of contemplators or philosophers, without any hostility or alienation between them; but rather allied and united by mutual assistance. Let there be, in short, one method of cultivating the sciences, and another of discovering them. (Bacon, p. 344)

This seems like a rational and moderate assessment of the multiform talents of mankind and their optimal use. While Bacon's division of learning into two distinct spheres and his use of the term "tribes" may seem like a precursor to C. P. Snow's twentieth century division of the intellectual world into two unreconciled "cultures," his characteristic division of learning appears more like a semantic tool or a rhetorical device than an actual description of the ideal state of affairs. Certainly, the antipathetic dichotomy which Snow describes is not a result desired by Bacon. In his own long and distinguished legal career, Bacon himself had encouraged many a discussion and embellished many a harangue to great effect. His own scientific treatises show the influence of the ancient system, since he formulates the results of his experimentation as a series of prolix axioms. Yet, Bacon can never escape the conclusion that humanist studies pose a subtle and insidious threat to his system of natural philosophy:

A second cause [for the decline of learning] offers itself, which is certainly of the greatest importance; namely, that in those very ages in which men's wit, and literature flourished considerably, or even modestly, but a small part of their industry was bestowed on natural philosophy, the great mother of the

sciences. For every art and science may, perhaps, be polished and put into serviceable shape, but can admit of little growth.

(Bacon, p. 356)

It seems the philosopher can pursue either humanist studies or natural philosophy, but not both. Thus, while believing in the overarching integral unity of knowledge, Bacon establishes this very clear tension between experimental science and humanist learning - a tension which he seeks to assuage by carving out appropriate niches for each discipline in the human scheme of things. Of course, this mediation on Bacon's part greatly benefitted empiricism, which many scholars refused to admit to the intellectual world. It is interesting to note that, in many respects, Bacon espouses the same technique to nurture empirical science as the early medieval scholars used to found scholasticism. He argues for the tolerance of empirical scientists who, working in relative seclusion at least intellectually speaking, would seek to bring the fruit of enlightened science to an uneducated, scientifically barbaric populace (if I may be allowed the melodrama of such a statement).

Digressing slightly, it is profitable to look at one small work by Abraham Cowley in light of these last conclusions. Cowley, a contemporary of Bacon's, was a poet, a natural philosopher and a Fellow of the Royal Society. As a poet, he was highly regarded by John Milton, though modern critics do not share the blind bard's opinion. In 1661, he published a short prose work entitled "A Proposition for the Advancement of Experimental Philosophy." In many respects, it reflects not only Bacon's ideas and underlying principles but also his characteristic symbols and patterns of imagery. For example, Cowley's line:

. . . but it were madness to imagine that the cisterns of men should afford us as much and as wholesome waters as the fountains of nature. (Cowley, p. 112)

echoes many of Bacon's comparisons between knowledge and fountains of water.

Again:

Our reasoning faculty, as well as fancy, does but dream when it is not guided by sensible objects. We shall compound where Nature has divided and divide where Nature has compounded, and create nothing but either deformed monster or, at best, pretty but impossible mermaids. (Cowley, p. 113)

parallels quite closely with Bacon's statements regarding the fanciful creations of the human mind when it is not guided by the "things" of the material world.

The basic proposition elaborated by Cowley in this treatise is the establishment of a philosophical college dedicated to the discovery of natural laws through rigorous experimental techniques. The constitution of the college is quite practical. It is a self-contained community of twenty scholars. While, during the first few years of operation, Cowley expects it to be subsidized by the state, he maintains that the useful inventions arising from the scholars' studies would soon foot all of the bills - a subtle echo of Bacon's premise that the proper goal of science is the creation of useful inventions to extend man's dominion over the earth. Paralleling Bacon's exhortation to maintain the solidarity of the scientific community, Cowley

enjoins his scholars to maintain the nicest sense of brotherhood and courtesy among themselves, at the risk of expulsion. In fact, echoing Bacon's interesting adoption of early scholastic techniques, Cowley's college resembles no other institution so much as a medieval monastery. The scholars are even enjoined not to marry and the college is to provide elementary and secondary education to the next generation of scientific converts at a college school. The only substantial difference is the relative lack of religious direction to the scholars' work. A Chaplain is provided for in the constitution of the college, but Cowley carefully limits his role so

that he shall not trouble himself and his auditors with the controversies of divinity, but only teach God in his just commandments and in his wonderful works. (Cowley, p. 122)

This last point leads to perhaps the most significant tenet of Bacon, which is his secularization of natural philosophy. Throughout his Instauratio Magna, he carefully points out that experimental science, through its study of God's creation, can only lead to a greater understanding of God and to the purging of superstition from our society. Yet, even more so than humanistic studies, he places theology and religion beyond the pale of philosophic contemplation or exploration:

First, then, we admonish mankind to keep their senses within the bounds of duty as regards divine objects. For the senses, like the sun, open the surface of the terrestrial globe, but close and seal up that of the celestial; next, that whilst avoiding this error, they fall not into the contrary, which

will surely be the case, if they think the investigation of nature to be in any part denied as if by interdict.

. . . we moreover humbly pray that human knowledge may not prejudice divine truth, and that no incredulity and darkness in regard to the divine mysteries may arise in our minds upon the disclosing of the ways of sense, and this greater kindling of our natural light; but rather that, from a pure understanding, cleared of all fancies and vanity, yet no less submitted to, nay, wholly prostrate before the divine oracles, we may render unto faith the tribute due unto faith.

(Bacon, p. 337)

In his epistemology, Bacon clearly turns Augustinian dogma on its head. Augustine begins with the omnipotence of God as the first principle and deduces the rest of his philosophy from that precept. Bacon begins with the validity of the senses and the power of reason when correctly guided and proposes to construct a new natural philosophy on that foundation. But when confronted with the ineffable mysteries of God which are inaccessible to the senses and unfathomable by reason, he can find no logical place for the "divine truths" in his Novum Organum. Thus, in his eminently practical way, Bacon treats religion and theology as completely separate and distinct bodies of knowledge. They remain for him unquestioned, untested principles. In the process, he strips philosophy of its peculiarly Christian substratum which had been its European hallmark throughout the Scholastic and Renaissance Humanist eras. From now on, science will grow to be increasingly secular.

Before leaving Bacon, we should make a final attempt to place him in his proper perspective. In his advocacy of experimental science, Bacon clearly

signals the advent of modern, empirical science. In many respects, his system of philosophy, especially as regards experimental methods and the fellowship of all scientists, bears a striking resemblance to the conduct of scientific exploration today. Yet, as a practical means for organizing scientific results and arriving at interpretations of nature, Bacon must be regarded as a failure. His rejection of mathematics as a scientific tool [he showed disdain for the numerology and superstition which often surrounded mathematics in the Renaissance] and his use, instead, of a cumbersome and legalistic compendium of natural axioms to codify his conclusions resulted in an impractical interpretative system. Thus, he shines forth as a propagandist for experimental science, rather than a founding father of the "scientific method." He made empiric studies possible through his powerful and influential patronage. In the process, however, of carving out a sphere of influence for science, he introduced the tension between science and humanistic studies and he began the process of the secularization of science. At the time, he did so to protect science from powerful antagonists. In time, his practices led to the situation described by C. P. Snow in his Rede Lecture when he states:

I believe the intellectual life of the whole of western society is being split into two polar groups . . . Literary intellectuals at one pole - at the other scientists, and as the most representative, the physical scientists. Between the two a gulf of mutual incomprehension - sometimes (particularly among the young) hostility and dislike, but most of all lack of understanding. (Snow, p. 4)

The Great Contention

Our consideration of Sir Francis Bacon brings us into the seventeenth century proper. In this century, many of the tensions whose rather subconscious development we have been tracing since St. Augustine break tumultuously out into the often bewildered intellectual consciousness of this pivotal era. Ancient or hierarchical authority versus personal experience, religious faith versus human reason, spiritual experience versus sensuous experience - all of these dichotomies become manifest in the intellectual, political and social debates of the age. Before finally launching into a discussion of Milton's place in this whirlwind, I think that it will be useful to present two examples which represent, in many respects, the antipodal extremes of the intellectual climate which we will seek to understand along with an example of an individual who was able to breach, in his own unique way, this "great gulf fix'd."

The Neo-Platonists of Cambridge University represent the seventeenth-century manifestation of the great tradition embodied in the Renaissance Humanists and their Scholastic antecedents. Proceeding on the premise that the sublime truths of the Christian revelation, while still present in the medieval writings, were often concealed by the scholastic accretions of the past millenium, they sought to revitalize them for their contemporaries. To do this, they appealed simply to Reason, which they dubbed "the candle of the Lord," and to the validity of religious, supernatural experience. (Willey, p. 135) In a sense, they rather ironically co-opted the empiricism of the age by including these spiritual experiences as valid data upon which the mind of man could successfully exercise his God-given gift of Reason. It is quite logical then, given their affirmation of spirituality,

that they should adopt as their philosophical and theological matrix the doctrines of Plato, which emphasize the "reality" of the supernatural world of forms and spirit as compared with the mere shadow-play which we find here on the material earth.

Despite their advocacy of an ancient philosophical system, the Cambridge Platonists were not simply anachronisms in their own century. In many respects, they reacted sympathetically to empirical ideas. Like Montaigne, they were more interested in the development of character and of a Christian lifestyle than they were in debating arcane points of theology. (Willey, p. 136) Like Bacon, they were interested in "effects," though the effects they sought were in the realm of morality and religion and not in the realm of technological control over man's environment. In a sense, they attempted to inject the epistemology and some of the interests of empiricists into an intellectual matrix where theology still retained its supremacy.

In the face of their best efforts to focus contemporary interest on the Christian life as viewed through their Platonic window, the Cambridge Platonists became more and more isolated and neglected. This is partially a result of their style and their methods. They consciously rejected confrontational treatises, being convinced that man needs only the Truth presented to him in a rational fashion to become convinced of its verity. In a century which saw, among other traumatic events, the first regicide in the history of a major modern European nation, their cool and rational advocacy was soon drowned out by more strident voices. Furthermore, despite some modern sympathies, they presented most of their ideas and arguments in the driest and most turgid of scholastic tomes. (Cassirer, pp. 157-159) They endeavored to create monstrous philosophical systems which would intimidate all but the most assiduous of university scholars. Thus, their message was largely lost on an

audience which had neither the patience nor the tolerance to wade through their elephantine works.

Finally, and most importantly, the Cambridge Platonists failed to develop a compelling method for pursuing the study of natural philosophy, which, after all, comprises a premier intellectual issue of the age. Again, they were foiled by their own interests and their style. Few of the Cambridge Platonists had any real scientific curiosity about the natural world around them. Those that did had precious little aptitude in scientific skills. (Cassirer, p. 130) Whenever they were lured from their chosen field of interest to venture into the wilderness of natural philosophy in order to win allies for their cause, they invariably fell back upon the old natural philosophy of the Greeks or created a universe animated by new spirits and essences. (Cassirer, p. 131) In short, they generally appeared ridiculous to their more scientifically gifted peers when discussing the operation of the world around them. As a result, they were left behind by the empiricists and ignored by the more strident religious puritans.

In their massive treatises outlining their system of rational theology, the Cambridge Platonists sought to do battle against what they perceived as the atheistic materialism and mechanism embodied in Thomas Hobbes. (Willey, p. 136) Hobbes was a philosopher and educator whose own personal intellectual awakening came about through the study of Euclidean geometry. In his magnum opus on political economy, The Leviathan, Hobbes begins his treatment of his subject by dwelling on the definitions and postulates about the operation of nature and of man in nature, like any good geometer. In his initial discussions about man's senses, he boldly displays his mechanistic beliefs:

All which qualities called sensible are in the object that

causeth them but so many several motions of the matter, by which it presseth our organs diversely. Neither in us that are pressed are they anything else but diverse motions (for motion produceth nothing but motion). (Hobbes, p. 49)

Taking this one step further, Hobbes applies the mechanistic explanation with which he describes matter to man and his actions. He sees man as a machine who is motivated either by being attracted to some material good or by being repelled away from some material evil. He pithily summarizes this belief in the following excerpts:

For there is no such finis ultimus . . . nor summum bonum . . . as is spoken of in the books of the old moral philosophers.

So that in the first place, I put for a general inclination of all mankind a perpetual and restless desire of power after power that ceaseth only in death.

Competition of riches, honour, command or other power inclineth to contention, enmity, and war, because the way of one competitor to the attaining of his desire is to kill, subdue, supplant, or repel the other. (Hobbes, p. 76)

Hobbes allows for no cooperation among men, no influence of religion or charity in men's lives, no motives besides that of gaining material advantage, which, in all cases, is driven by man's mechanical nature. Having laid his materialistic foundation through carefully constructed, almost geometric definitions and postulates, Hobbes then proceeds inexorably to justify a

Commonwealth which, in its constitution and purposes, seeks to uphold a mechanical status quo.

He begins by accepting the view of man's nature which he portrays without any moral or ethical qualms:

The desires, and other passions of man, are in themselves no sin. No more are the actions that proceed from those passions till they know a law that forbids them; which till laws be made they cannot know, nor can any law be made till they have agreed upon the person that shall make it. (Hobbes, p. 85)

In such condition . . . the life of man [is] solitary, poor, nasty, brutish, and short. (Hobbes, p. 85)

The Cambridge Platonists could only be disposed to agree with the last of these typically Hobbesian statements. Hobbes even manages to extend his mechanical view of nature to the workings of man's society. The Commonwealth which he goes on to describe continues the mechanical analogy. All manner of coercion and force are allowed the sovereign in order to preserve "peace" and "security." Even religion becomes a tool of the sovereign power.

Hobbes readily surrenders religion to the use of the sovereign because he exhibits little belief in the validity of supernatural and spiritual experiences which form the core of religion to the Cambridge Platonists. At one point, he ascribes the religions of the ancients to their "ignorance of how to distinguish dreams and other strong fancies, from vision and sense." (Hobbes, p. 51) This disdain for pagan "revelation" can be easily transferred to Christian "revelation." Hobbes rather perfunctorily admits the possibility

of divine revelation, in a few very select cases, but he expends no energy in describing how to discern true revelation from ignorance of fancies. In the end, Hobbes urges submission to the discretion or whim of the sovereign to validate those "revelations" with which it is most comfortable - the comfort of the sovereign being Hobbes' obsessive goal.

Finally, Hobbes, in a move which builds upon Bacon's original desire to protect science, drives wedges between science and literature. He begins with his favorite view of science - the geometric view.

Seeing then that truth consisteth in the right ordering of names in our affirmations, a man that seeketh precise truth hath needs to remember what every name he uses stands for, and to place it accordingly . . . and therefore, in geometry (which is the only science that it hath pleased God hitherto to bestow on mankind), men begin at settling the significations of their words; which settling of significations, they call definitions, and place them in the beginning of their reckoning.

So that in the right definition of names lies the first use of speech; which is the acquisition of science: and in wrong, or no definitions, lies the first abuse; from which proceed all false and senseless tenets. (Hobbes, p. 56)

Clearly, Hobbes recognizes the importance of semantics for the acquisition of knowledge. Furthermore, he views literature and especially poetry as, at best, suspect uses of language. For him, poetry, rising from the imagination, is nothing more than decaying sense. He will allow poetry, if it is mixed with

judgment and discretion to weigh down any flights of fancy, but his indulgence is clearly conditional and not at all sympathetic.

Finally, Hobbes is a convinced scientific empiricist. He understands what science is and how it operates and progresses:

There are knowledge of two kinds, whereof one is knowledge of facts; the other knowledge of the consequence of one affirmation to another. The former is nothing else but sense and memory and is absolute knowledge . . . the latter is called science, and is conditional. (Hobbes, p. 71)

Here we see simply another statement of Bacon's belief that science requires empiric facts interpreted and organized by human reason. About human reason, Hobbes should be allowed one final quotation:

In sum, in what matter soever there is place for addition and subtraction, there is also place for reason; and where these have no place, there reason has nothing at all to do.

(Hobbes, p. 58)

No more succinct and devastating attack could be leveled against the beliefs of the Cambridge Platonists and no more pungent summation could be made of scientific materialism and mechanism.

Between these two extreme poles stands the pleasant figure of Sir Thomas Browne. A doctor, a poet and a prose stylist, Browne expresses the core of his beliefs in his marvelous confession Religio Medici [The Faith of a Doctor]. In so many ways, Brown stands out as a conciliatory figure who is able to

reach a compromise between religious faith and scientific empiricism, at least in his own heart and mind, and act on it in his own life.

As a brief introduction to the tenor of Browne's thought, consider the following citation:

It is as uncharitable a point in us to fall upon those popular scurrilities and opprobrious scoffs of the Bishop of Rome, to whom, as a temporal prince, we owe the duty of good language. I confess there is a cause of passion between us: by his sentence I stand excommunicated; heretick is the best language he affords me; yet can no ear witness I ever returned him the name Antichrist, Man of Sin or Whore of Babylon. It is the method of charity to suffer without reaction.

(Browne, p. 5)

Charity is, above all else, Browne's watchword and credo. In a humanist fashion, his constitution is amenable to the moderate consideration and even adoption of antithetical or paradoxical philosophical tenets. Browne justifies this approach through his belief in the microcosm analogy - for him, man carries within him all of the often contradictory and paradoxical phenomena which Browne perceives in nature:

For it is also thus in nature: the greatest balsomes do lie enveloped in the bodies of most powerful corrosives. I say, moreover, and ground upon experience, that poisons contain within themselves their own antidote, and that which preserves them from the venom of themselves, without which they

were not deleterious to others onely, but to themselves also. But it is the corruption that I fear within me, not the contagion of commerce without me. . . and therefore "Defenda me Dios de me" . . . is a part of my letany [sic], and the first voice of my retired imaginations. There is no man alone, because every man is a microcosm, and carries the whole world about him.

(Browne, p. 84)

This discussion of the balsomes and poisons in nature betrays Browne's practical and empirical side, a facet of his personality which reflects the scientific nature of his chosen profession - medicine. For Browne, the information provided by the sense forms an invaluable part of man's worship of God.

These are contemplations metaphysical: my humble speculations have another method, and are content to trace and discover those expressions He hath left in His creatures, and the obvious effects of nature. There is no danger to profound these mysteries, no sanctum sanctorum in philosophy. The world was made to be inhabited by beasts, but studied and contemplated by man; 'tis the debt of our reason we owe unto God, and the homage we pay for not being beasts . . . the wisdom of God receives small honour from those vulgar heads that rudely stare about, and with a gross rusticity admire his works.

(Browne, p. 14)

Again, I am confident and fully perswaded, yet dare not take my oath, of my salvation. I am as it were sure, and do believe with-

out all doubt, that there is a city of Constantinople; yet for me to take my oath thereon were a kind of perjury, because I hold no infallible warrant from my own sense to confirm me in the certainty thereof. (Browne, p. 65)

Sense, therefore, provides man with proofs and warrants for his understanding of the world. Browne even elevates the study of nature through the senses, allied with reason, to a form of devotion and worship. In fact, all of these quotations, while affirming the validity of concrete empiricism, hint at another equally valid realm of experience besides that of the senses. Browne elaborates on this realm in an important, almost poetic passage:

. . . I am sure there is a common spirit that plays within us, yet makes no part of us; and that is, the Spirit of God, the fire which is the life and radical heat of spirits, and those essences that know not the vertue of the sun; a fire quite contrary to the fire of Hell. This is that gentle heat that brooded on the waters, and in six days hatched the world; this is that irradiation that dispels the mists of hell, the clouds of horror, fear, sorrow, despair; and preserves the region of the mind in serenity. Whosoever feels not the warm gale and gentle ventilation of this spirit, though I feel his pulse, I dare not say he lives: for truly, without this, to me there is no heat under the tropick; nor any light, though I dwelt in the body of the sun. (Browne, p. 36)

For Browne, the realm of spiritual experience plays as large a role in man's life as that of sensuous experience.

Of course, this spiritual realm cannot be explained or quantified in the same manner as the concrete sensuous realm. In the past, this has led to quite contradictory spiritual and theological doctrines. While this may disturb a more rigidly logical man or a more partisan dogmatist, Browne welcomes this challenge as a kind of guarantor of his faith:

As for those wingy mysteries in divinity, and airy subtleties in religion, which have unhing'd the brains of better heads, they never stretched the pia mater of mine. Methinks there be not impossibilities enough in religion for an active faith; the deepest mysteries ours contains have not only been illistrated, but maintained by syllogism and the rule of reason. I love to lose myself in an O altitudo! . . . I can answer all the objections of Satan and my rebellious reason with that odd resolution I learned of Tertullian, Certum est quia impossibile est. I desire to exercise my faith in the difficultest point; for to credit ordinary and visible objects is not faith, but perswasion. . . I would not have been one of those Israelites that pass'd the Red Sea, nor one of Christ's patients on whom he wrought his wonders; then had my faith been thrust upon me, nor should I enjoy that greater blessing pronounced to all that believe and saw not. 'Tis an easy and necessary belief, to credit what our eye and sense hath examined. (Browne, p. 9)

In this separate realm of religious experience, of faith, of the spiritual, sense and reason have no part. Browne's love of paradox, his belief in the supernatural and his supreme faith all come together in this synthesis.

In the end, Browne's Christian faith becomes the framework in which he unites many of the tensions inherent in the seventeenth century. In a spirit of Christian charity, he can accept all manner of ideas and tenets, whether philosophic, scientific or religious; as an exercise in faith, he welcomes religious and spiritual paradoxes; and, finally, as a man most concerned with his personal salvation, Browne is able to avoid the temptations which the pursuit of earthly wisdom pose for the Christian:

Solomon that complained of ignorance in the height of knowledge, hath not only humbled my conceits, but discouraged my endeavors. There is yet another conceit that hath sometimes made me shut my books, which tells me it is a vanity to waste our days in the blind pursuit of knowledge; it is but attending but a little longer, and we shall enjoy that by instinct and infusion, which we endeavor at here by labour and inquisition.

(Browne, p. 81)

I conclude therefore, and say, there is no happiness under (or as Copernicus will have it, above) the sun, nor any crambe in that repeated verity and burthen of all the wisdom of Solomon, all is vanity and vexation of spirit. . . That wherein God himself is happy . . . that I call happiness; whatsoever else the world terms happiness, is to me a story out of Pliny, a tale of Boccace or Malizpini, an apparition, a neat delusion, wherein there is no more happiness than the name. Bless me in this life

with but peace of my conscience, command of my affections, the love of Thyself and my dearest friends, and I shall be happy enough to pity Caesar. These are, O Lord, the humble desires of my most reasonable ambition. . . (Browne, p. 91)

Browne's synthesis, therefore, is made possible by this ultimate desire. Unlike Bacon, who strives for power over the environment, or Hobbes, who seeks to sustain the political status quo in the name of stability, or the Cambridge Platonists, who seek to place organized religion and religious experience on a rational foundation in order to create a righteous society, Browne seeks personal happiness through Christian faith.

To summarize and epitomize Browne would be an elusive goal for any analyst, so I will let Browne summarize himself:

We are onely that amphibious piece between a corporal and spiritual essence, that middle form that links those two together, and makes good the method of God and nature, that jumps not from extreams, but unites the incompatible distances by some middle and participating natures. That we are the breath and similitude of God, it is indisputable, and upon record of Holy Scripture; but to call ourselves a microcosm, or little world, I thought it only a pleasant trope of rhetorick till my near judgment and second thoughts told me there was a real truth therein. . . Thus is man that great and true Amphibium, whose nature is disposed to live, not onely like other creatures in divers elements, but in divided and distinguished worlds.

(Browne, p. 91)

In a century where personal happiness seemed so impossible a goal, where power, both political and religious, dominated the events of the day, where compromise and moderation found no champion, a viewpoint such as Browne's was unique. He represents a voice soon to be drowned out by the din of battle and the cacophony of polemic.

THE FIGURE OF MILTON

Biography

With a history of the development of modern western thought as a backdrop and with an outline of the major tensions present in the seventeenth century as a setting, we can begin to focus profitably on the figure of Milton and the significance of his literary works in defining the relationship between science and the humanities. Milton enters the intellectual discourses of the century well aware of both its background and its current problems. The question of the validity of spiritual experience versus empiric experience, of faith versus reason, of authority versus personal inquiry, and of the value of poetry and literature in an age seething with political and social upheaval and concentrating more and more on producing concrete effects in man's environment intrigued Milton and challenged him to attempt to create his own personal response. In creating this response, Milton did not seek to isolate himself in remote academic splendor. He was deeply involved in the events of his age, both as a keen observer and a dedicated participant.

Milton was born on 9 December 1608 in Bread Street, Cheapside, London. His father was a devout Protestant and a hard-working, prosperous scrivener. Though few details are known of his early childhood, it seems that Milton was raised in an atmosphere of love and kindness, tempered, though gently, with the Puritan ideals and discipline of his father. In 1620, Milton was admitted to St. Paul's school in London, where he received an education befitting his father's wealth and his own plans to attend a university. On 12 February 1625, Milton was admitted to Christ's College, Cambridge. (Milton, p. xiii)

At Cambridge, Milton's genius and purity became manifest. This is not to say that he was a model student. There is some evidence to indicate his impatience with both the substance and the method of instruction to which he was subjected at Cambridge. He was supposedly whipped at one time by his tutor, one of the older Cambridge dons. This treatment was clearly alien to Milton, who was the pride of his father's house, and resulted in the rather unprecedented step of changing his tutor. Additionally, Milton was suspended from the University for some unspecified infractions. Yet, despite this chafing at the bit, Milton was admired and respected by both the dons and his fellow students at Cambridge. He acquired the nickname of "the Lady of Christ's" due both to his fair complexion and his upright and virtuous lifestyle. He received his Master of Arts degree on 3 June 1632 to the acclaim of the University. (Milton, pp. 1021-1024)

After his university education, Milton took up residence at his father's retirement home at Hammersmith in Middlesex. His original plans to join the clergy were thwarted by the religious situation in England at the time, so Milton received his father's permission to pursue a literary career. For the next six years, Milton continued his readings in the ancient Latin and Greek authors which he had begun in college, and wrote poetry in relative peace and seclusion. Milton described his activities during this period as follows:

At my father's country residence, whither he had retired to pass his old age, I was wholly intent, through a period of absolute leisure, on a steady perusal of the Greek and Latin writers, but still so that I occasionally exchanged the country for the city, either for the purpose of buying books, or for that of learning anything new in mathematics

or in music, in which I then took delight. (Woodberry, p. 79)

This period of self-directed studies and exercises was of crucial importance to Milton's later career and literature. It helped to provide the base for Milton's encyclopedic knowledge of both ancient and contemporary authors; it enabled him to develop his poetic style characterized by the richness and smoothness of the language, the majesty of the tone, and the ubiquity of learned allusion; and it led to his determination to make his impact on English society as a poet. During this time Milton experimented greatly with poetic forms. He wrote numerous sonnets and minor poems, the noted elegy "Lycidas," and a dramatic work in the form of the then popular masque called "Comus," in which he seeks to defend the principle of chastity. Milton describes his own early goals and principles best in the following passage:

And long it was not after, when I was confirmed in this opinion, that he, who would not be frustrate of his hope to write well hereafter in laudable things, ought himself to be a true poem; that is, a composition and pattern of the best and honourablest things; not presuming to sing high praises of heroic men, or famous cities, unless he have in himself the experience and the practice of all that which is praiseworthy. These reasonings, together with a certain niceness of nature, an honest haughtiness and self-esteem, either of what I was or what I might be (which let envy call pride), and lastly that modesty whereof, though not in the title page, I may be excused to make here some beseeeming profession; all these uniting the supply of their natural aid together kept me still above low descents of mind.

(Woodberry, pp. 82-83)

Milton's clear relationship with the intellectual past and his sensitivity to the issues of the present are evident in this passage. The pursuit of high ideals espoused by ancient authors and their Renaissance discoverers, the Humanist emphasis on the development of character and lifestyle and Montaigne's concern with experience in the real world are all reflected in Milton's early thought. While his tone becomes harsher and his prospect more forbidding due to the exigencies of civil war and the disappointments of his personal life, this essence of his thought, developed in the serenity of his father's retreat during his early manhood, will remain constant.

In May 1638, Milton left his father's retreat to begin a journey to Italy. Using letters of introduction from Sir Henry Wotton, who mentioned with praise his "Comus," Milton journeyed for more than a year in the homeland of the Renaissance. He matched wits with young Italian scholars, visited the ruins of ancient Rome and even visited the great Galileo and looked through his "Optic glass."

His visit was cut short by the growing constitutional crisis in England which pitted the monarchy, and its attendant aristocrats, against the forces of the Puritan parliament. While Milton played little part in the military conflicts of the Civil War, he did play a role as a gifted and persuasive pamphleteer arguing for the Parliamentary side. His increased activity in the public life was mirrored by changes and developments in his private life. In 1640, he moved to London and established a small academy for the children of friends and relatives. His academy was distinguished by the breadth of the curriculum and the relatively informal and friendly atmosphere. In 1642, he married Mary Powell, a rather strange choice given her family's Cavalier

reputation and status as debtors to Milton's father. In fact, the marriage was not a happy one, probably owing to the difference in ages (Milton was thirty-four and Mary Powell was seventeen when they were married), family background and the great intellectual gulf between them. Two months after the marriage, Mary returned to her family for a separation of three years, and even after their later reconciliation in 1645 their relationship was strained until her death in 1652, after having borne Milton a son and three daughters. (Woodberry, pp. 85-90)

After the establishment of the Commonwealth, Milton joined the administration of the Council of State as its Secretary for Foreign Tongues. In this position, Milton was responsible for some of the day to day diplomatic necessities of the Commonwealth. He found his real niche, however, as the public apologist for the Commonwealth in the world community. He defended both the ways and means of the English Civil War and its resultant republican government against a hostile and potentially belligerent Catholic Europe. Using his prodigious powers of logic and persuasion, coupled with his masterful command of both English and Latin, Milton documented the tyranny of the Stuart kings and justified the extreme measures taken by the English people to vouchsafe their liberties, both political and religious. His treatises of the period burn with the white-hot conviction that the Commonwealth was moving to establish a righteous, Christian society in a heretofore decadent England. The prodigious nature of Milton's effort in behalf of the Commonwealth becomes even more outstanding when considered in the light of Milton's total blindness, which came about in 1652. Led to the Council chambers, Milton listened to the dispatches of the day and dictated the replies. (Woodberry, pp. 93-94)

Milton's dedication to the revolutionary cause persisted even in the face of the imminent restoration of the Stuart monarchy. In February 1660, he published A Ready and Easy Way to Establish a Free Commonwealth, proposing an elitist republican form of government in order to rectify the chaos in government induced by Cromwell's death and to help preserve the accomplishments of the revolutionary Commonwealth. In June of the same year, the Parliament of the restored monarchy resolved upon Milton's arrest. Apart from the Regicides themselves, Milton was probably the most prominent target for Stuart revenge due to his vociferous defense of the revolutionary movement, and his fate was clearly in jeopardy in the early years of Charles II's reign. But, in December of 1660, Parliament relented and released Milton from its custody. (Milton, p. xiv)

Milton returned to an obscure private life after years of intimate involvement in the affairs of the nation and the world. During the twenty year period from 1642 to 1662, he wrote very little poetry, and even some of that had political or polemical ends in mind. After his release from prison, Milton returned to his literary pursuits and particularly to the writing of the epic poem for which he had studied and prepared for so long. (Woodberry, p. 96) Earlier, he had resolved to become something of a national poet, along the lines of Homer or Virgil, and write the definitive English epic. In the pursuit of this goal, he had listed over one hundred possible topics worthy of epic consideration and had very seriously considered writing an Arthurian epic detailing the events of England's mythic past. Yet, for literary, political and religious reasons, he chose instead the biblical story of creation and the Fall for his epic work. The result was Paradise Lost, published, during his lifetime, in two different editions in 1667 and 1674. In 1671, he published Paradise Regained, dealing with Christ's refusal of the temptation to which

Adam and Even had fallen in Paradise Lost, and Samson Agonistes, a drama concerning Samson's destruction of the Philistines after his betrayal at the hands of Delila. During this period, he also finished working on his monumental theological work De Doctrina Christiana, in which he details the elements of the Christian religion as he interprets them based on his personal readings of the Scriptures and the early Church Fathers and his own personal experiences and revelations. Containing many less than orthodox doctrines, to put it mildly, Milton intended for it to be published shortly after his death. It was lost, however, until the early nineteenth century when it was translated from the Latin and published by Bishop Charles Sumner in 1825. (Milton, p. 900) Milton died in relative obscurity on 8 November 1674. (Milton, p. xiv)

Of Education

In our previous discussions of Scholasticism and Renaissance Humanism, education played a significant role in the development of man and of society. In many key respects, Scholasticism was a primarily pedagogic movement seeking to preserve the knowledge of the Roman Empire. Humanism emphasized the study of ancient authors, in their own tongues, in order to develop individual character and virtues - to make man's life the supreme poem. A thorough and comprehensive educational system is necessary in order to pursue these lofty goals. From a superficial glance at Milton's own life, he recognized the importance of both the ways and means of education in living a full and productive life. In addition to the traditional education which he had received at St. Paul's School and at Cambridge, an education at which he often bridled in his precocity and impatience to learn, he tutored himself for six solid years at his father's country retreat and for another year in the whirl of Italian court circles. Upon his return, he sought to pass on the fruits of his studies not only through the medium of his poetry and prose, but also in the daily, personal instruction of a select group of young pupils. Given this historic concern with education and Milton's personal interest in educating both himself and others, our inquiry into Milton's synthesis of science and the humanities should begin with his consideration of the topic of education.

Milton's definitive discussion of education can be found in his short prose work entitled, sensibly enough, "Of Education." Addressed to Master Samuel Hartlib (a writer whose books on agriculture, religion and education won him a pension from Parliament), it was first published in 1644 as an informal pamphlet without title page, date or publisher's name. It was

reissued in 1673 without significant change as part of a larger edition of Milton's poetry. A short and entertaining prose work, it nevertheless expresses several fundamental ideas of Milton which will find fuller and more majestic treatment in his epic poems.

After a brief introduction to Master Hartlib, Milton immerses himself in his topic in a manner which not only outlines his own theory of education but also exhibits his own relationship to the intellectual past which we have explored:

The end then of learning is to repair the ruins of our first parents by regaining to know God aright, and out of that knowledge to love him, and imitate him, to be like him, as we may the nearest by possessing our souls of true virtue, which being united to heavenly grace of faith makes up the highest perfection. But because our understanding cannot in this body find itself but on sensible things, nor arrive so clearly to the knowledge of God and things invisible as by orderly conning over the visible and inferior creature, the same method is necessarily to be followed in all discreet teaching. And seeing every nation affords not experience and tradition enough for all kinds of learning, therefore we are chiefly taught the languages of those people who have at any time been most industrious after wisdom; so that language is but the instrument conveying to us things useful to be known. And though a linguist should pride himself to have all the tongues that Babel cleft the world into, yet, if he have not studied the solid things in them as well as the words and lexicons, he were nothing so much to be esteemed a learned man as any yeoman or tradesman competently wise in his mother dialect

only. (Milton, p. 631)

The Scholastic insistence on the religious nature of education, the Humanist focus on philology and the Baconian concern with the solid things of this world all find their expression in this educational credo of Milton. Yet Humanism and empiricism are clearly subordinate means to Milton's essentially spiritual goal - to recover the Edenic state of innocence, divine grace and intuitive wisdom which was lost to mankind through the Fall of Adam from obedience to God's sole commandment in Paradise.

This supreme end of learning provides us with a key clue to Milton's underlying personality and convictions. His goal of recovering a divine state of grace through human intellectual efforts characterizes Milton as an optimist dedicated to human progress and quite opposed to epistemological skeptics and purely mystical Christians. He believes that man can and should progress; that, in time and building on the base provided for us by our intellectual predecessors, man can reach the state from which we have fallen. Of course, this process requires the gift of divine grace which Milton briefly cites in the passage above, but it requires an equal effort on the part of man, an effort which has validity in and of itself and not simply as a ritual to tease God's grace from him like some kind of intellectual rain dance. For Milton, learning leads to virtue, which coupled with faith leads to "the highest perfection," a perfection once lost but still within the determined man's grasp.

Despite the lofty goals and high-flying language of this introduction, Milton concerns himself intimately with affairs here on earth and with producing effects in human society with which Bacon himself would be proud. If his goal is primarily spiritual, Milton clearly seeks to accomplish it through

matter. We have seen above how Milton understands that knowledge of "things invisible" requires careful attention to "the visible creature." In later passages, he states that the challenge of education is to create an atmosphere in which the student will be

inflamed with the study of learning and the admiration of virtue - stirred up with high hopes of living to be brave men and worthy patriots, dear to God and famous to all ages . . .

(Milton, p. 633)

and . . . to inspire them with a gallant and fearless courage, which, being tempered with seasonable lectures and precepts to them of true fortitude and patience, will turn into a native and heroic valor, and make them hate the cowardice of doing wrong.

(Milton, p. 630)

In short, then Milton characterizes a complete and generous education as that which

fits a man to perform justly, skillfully and magnanimously all the offices, both public and private, of peace and war.

(Milton, p. 632)

Thus, the milieu for action for all educated men, according to Milton's ideas about education and its goal, would be society in all of its manifestations.

This concern with producing effects in society at large after having received a "proper" education is backed up with a solid empirical approach to knowledge during the educational process itself. Milton rejects the "scholastic grossness of barbarous ages" which sought first to cram the

"intellective abstractions of logic and metaphysics" into young and unseasoned minds unprepared to truly understand the concepts behind the subject matter. Instead, he begins his course of study with matters "most obvious to the sense." While endeavoring to instruct his charges in several foreign languages at once, including Latin, Greek, Italian and Hebrew, Milton would teach them:

. . . the rules of arithmetic, and soon after the elements of geometry, even playing, as the old manner was . . . and after astronomy, and geography, they may descend in mathematics to the instrumental science of trigonometry, and from thence to fortification, architecture, enginery, or navigation. And in natural philosophy they may proceed leisurely from the history of meteors, minerals, plants, and living creatures, as far as anatomy.

(Milton, p.634)

To set forward all these proceedings in nature and mathematics, what hinders but that they may procure, as oft as shall be needful, the helpful experiences of hunters, fowlers, fishermen, shepherds, gardeners, apothecaries; and in the other sciences, architects, engineers, mariners, anatomists; who doubtless would be ready, some for reward and some to favor such a hopeful seminary. (Milton, p. 635)

To round out this empiric education, Milton strongly supports sports and physical exertion as both healthy outlets for schoolboy energies and also as practically useful skills for "wayfaring, warfaring Christians."

The exercise which I commend first is the exact use of their

weapon, to guard and to strike safely with edge or point;
 this will keep them healthy, nimble, strong, and well in breath -
 is also the likeliest means to make them grow large and tall . . .

(Milton, pp. 637-638)

secondly,

. . . they are by a sudden alarum or watchword to be called out to
 their military motions, under sky or covert according to the
 season, as was the Roman wont; first on foot, then, as their age
 permits, on horseback, to all the art of cavalry; that having in
 sport, but with much exactness and daily muster, served out the
 rudiments of their soldiership in all the skill of embattling,
 marching, en- camping, fortifying, besieging and battering, with
 all the helps of ancient and modern stratagems, tactics and
 warlike maxims . . . (Milton, p. 638)

finally,

. . . after two or three years . . . to ride out in companies with
 prudent and staid guides to all the quarters of the land: learning
 and observing all places of strength, all commodities of building
 and of soil, for towns and tillage, harbors and ports for trade.
 Sometimes taking sea as far as our navy, to learn there also what
 they can in the practical knowledge of sailing and of sea fight.

(Milton, p. 638)

Milton's school would clearly not be an ivory tower of secluded scholars
 seeking after arcane and abstruse knowledge. To prepare his students for a
 life of reshaping society, Milton provides them with a cornucopia of

experiences and abilities. He fully recognizes and appreciates the value of approaching an understanding of the world in an empirical fashion.

If perhaps the value of Milton's pedagogical principles are placed in jeopardy by what seems to be his almost impractically varied and intensive curriculum, it should be remembered that Milton had considerable experience as a schoolmaster. He perhaps speaks with his tongue firmly planted in his cheek when he surmises that, in their off hours, his students could learn Hebrew with its Chaldean and Syriac dialects, but he did develop a novel system of language instruction which enabled the students in his small academy to acquire a better proficiency in Latin and Greek in a shorter period of time than their contemporaries enrolled in more conventional schools.

Intermixed with these empirical studies and varied personal experiences with which Milton would seek to acquaint his students is a carefully conceived study of the humanities. The first hints of Milton's concern with the humanities comes with his emphasis on linguistic training. Milton would carefully choose the early texts from which his students would learn their languages, not only for their merit as grammatical models, but also for their moral lessons:

. . . to make them expert in the usefulest points of grammar, and withal to season them and win them early to the love of virtue and true labor, ere any flattering seducement or vain principle seize them wandering, some easy and delightful book of education would be read to them, whereof the Greeks have store: as Cebes, Plutarch, and the other Socratic discourses.

(Milton, p. 633)

Additionally, Milton would use literature as a medium of studying science. Milton lists a huge inventory of such works; the following are cited to give an appreciation of their variety and utility:

- De re rustica of Cato for agriculture
- Aristotle's Natural History of Animals
- Seneca's Natural Questions for an introduction to astronomy
- The Works and Days of Hesiod; and
- Virgil's Georgics. (Milton, pp. 635-636)

Only after having learned of the world around them and mastered the languages of Latin and Greek would Milton have his students embark on their studies of ethics, economy, politics and literature - those studies which we term the humanities. Their early endeavors would have developed their reasoning abilities and aided in the maturing of their judgment so that they may begin to study the mechanics of human society to which the humanities seek to provide an insight. Milton begins with the works of such moral philosophers as Plato, Xenophon and Cicero as well as David and Solomon, and move through economy, politics, justice and the law, theology and church history and to the ultimate study of the "organic arts" of logic, rhetoric, poetry and drama. In all cases, Milton would closely link the abstract consideration of these topics with their practical application in society at large. For example, they should study politics so that:

. . . they may not in a dangerous fit of the commonwealth
be such poor shaken, uncertain reeds, of such a tottering
conscience, as many of our great counsellors have lately
shown themselves, but steadfast pillars of the state.

(Milton, p. 636)

Heroic poems, Attic tragedies and great political orations offer themselves up for commitment to memory so that, if

. . . solemnly pronounced with right accent and grace, as might be taught, would endue them even with the spirit and vigor of Demosthenes or Cicero, Euripides or Sophocles.

(Milton, p. 636)

A rigorous study of the humanities would prepare Milton's students for activity in society at large, for displaying and applying their learning, whether purely scientific or humanistic in content, to the benefit of their comrades. Milton leaves to last the consideration of "what great and glorious use might be made of poetry, both in divine and human things," because one must have an almost encyclopedic knowledge of the world, of man and of God, before the synthetic power of poetry can be brought to bear on the solution of man's problems here on earth. For Milton, the humanities are an incitement to action and a valuable aid in implementing change. They provide a framework for the study of society and the tools of organization and exposition to be used in modifying that society. The product of this educational experience is discussed by Milton as follows:

From hence, and not till now, will be the right season of forming them to be able writers and composers in every excellent matter, when they shall be thus fraught with an universal insight into things. Or whether they be to speak in parliament or council, honor and attention would be waiting on their lips. There would then also appear in pulpits other visages, other

gestures, and stuff otherwise wrought that what we now sit under, oftentimes to as great a trial of our patience as any other that they preach to us. (Milton, p. 637)

In this brief tractate, Milton outlines his basic ideas concerning education. While directed towards a spiritual end, the knowledge and imitation of God, Milton roots education firmly here on earth. Through education and learning man can progress towards a state of grace and wisdom originally lost to us by our first forebears. This learning must be based on an apt apprehension of sensible objects and concrete things, and Milton's broad-minded view of the value of empirical experience is mirrored by his inclusion of lectures by artisans, military men and tillers of the earth for his pupils, not to mention more formal studies of the natural sciences. All of these intellectual endeavors are contained within the matrix of an essentially humanistic education. Language instruction is universal in his ideal school, with the object of having the students acquire four or five languages, both ancient and modern. Finally, the students will be versed in the studies of society and its mechanics, with an accent on preparing themselves to lead society in the progression to a more righteous and pure manifestation which Milton's view of human progress posits.

Above all, Of Education clearly shows that action is Milton's primary concern. In both its methods and its goals, Milton's educational program espouses action. This concern with social action is mirrored not only in his more polemical political treatises of the Commonwealth era, but also in his poetry. In Of Education, we get the first glimpse of the importance Milton places on poetry as an incitement to action, both in the political and religious realms. In Paradise Lost, we shall see the embodiment of this

precept in an epic poem of dynamic range and scope, a poem where action born of knowledge captures the reader's attention.

MILTON'S EPIC POETRY

Progress and the Value of Human Endeavor

An essential element of Milton's educational philosophy, and therefore also of his social thinking, is the ability of man to improve himself through his own efforts while here on earth. This optimistic view of the nature of man and the nature of learning forms an underlying foundation for his epic poem Paradise Lost. In fact, the initial creation of man has as its sole end man's progress. Satan, having rebelled against the Will of God, drew with him into rebellion nearly a third of heaven's host. God creates mankind to replace these lost seraphim. Raphael relates this decision to Adam after his creation by quoting God as follows:

At least our envious Foe hath fail'd, who thought
All like himself rebellious, by whose aid
This inaccessible high strength, the seat
Of Deity supreme, us dispossess,
He trusted to have seiz'd, and into fraud
Drew many, whom thir place knows here no more;
Yet far the greater part have kept, I see,
Thir station, Heav'n yet populous retains
Number sufficient to possess her Realms
Though wide, and this high Temple to frequent
With Ministeries due and solemn Rites:
But lest his heart exalt him in the harm

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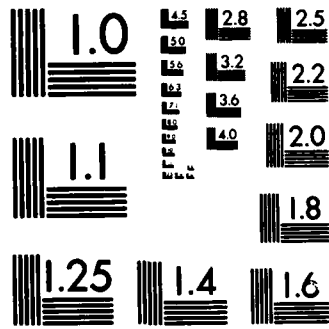
MILTON AND THE 'NEW PHILOSOPHY': AN HISTORICAL-LITERARY
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Already done, to have dispeopl'd Heav'n,
 My damage fondly deem'd, I can repair
 That detriment, if such it be to lose
 Self-lost, and in a moment will create
 Another World, out of one man a Race
 Of men innumerable, there to dwell,
 Not here, till by degrees of merit rais'd
 They open to themselves at length the way
 Up hither, under long obedience tri'd,
 And Earth be chang'd to Heav'n, and Heav'n to Earth,
 One Kingdom, Joy and Union without end.

(VII, 139-161)

In this transcendent vision, man will eventually rise to cohabit the wide realms of heaven, to help in ministering the high Temple of God. This rise, this cosmic progress, directly echoes the concern with progress evident in Of Education. Equally important, this progress will come about by man's own personal efforts, by the trying of his obedience, by the manifestations of his merit. The initial responsibilities placed on man's shoulders in Eden are few, yet critical: be fruitful and multiply in order to create this race with which to replenish heaven; tend the luxurious gardens of Eden; and, above all, refrain from eating the fruit of the Tree of Knowledge. If man obeys these simple laws, displaying his obedience and his merit, his progress is assured.

This is Milton's prelapsarian view of man's nature; it clearly reflects the optimism about man's progress and the value of man's own efforts in securing this progress which Milton first manifests in Of Education. But what is Milton's view of postlapsarian man's nature in Paradise Lost? Does it also

reflect this fundamental optimism? This is really the crucial question, for man presently lives in the fallen state endangered by Adam and Eve's transgression. Is progress still possible on earth and can it be achieved through man's own efforts? I believe the answer is still yes, although there are some important caveats to be recognized.

Milton's most direct commentary on the state of humanity after the fall is found in Books XI and XII of Paradise Lost, where the archangel Michael relates to Adam the history of the world from Cain and Abel to the Second Coming of Christ. Attacked by one critic as an "untransmuted lump of futurity," [Lewis, 16] it is admittedly an unpalatable treatment of much of man's future. Milton, through the medium of Michael, recites a litany of human degradation and impiety, beginning with Cain and continuing with Nimrod, Ham and Solomon. The overwhelmingly dismal view of human nature is epitomized in a vision created by Michael to show Adam Death's multifaceted face in this fallen world:

. . . Immediately a place
 Before his eyes appear'd, sad, noisome, dark,
 A Lazar-house it seem'd, wherein were laid
 Numbers of all diseases'd, all maladies
 Of ghostly spasm, or racking torture, qualms
 Of heart-sick Agony, all feverous kinds,
 Convulsions, epilepsies, fierce Catarrhs,
 Intestine Stone and Ulcer, Colic pangs,
 Daemonic Frenzy, moping Melancholy
 And Moon-struck madness, pining Atrophy,
 Marasmus, and wide-wasting Pestilence,

Dropsies, and Asthmas, and Joint-racking Rheums.
 Dire was the tossing, deep the groans, despair
 Tended the sick busiest from Couch to Couch;
 And over them triumphant Death his Dart
 Shook, but delay'd to strike, though oft invoc't
 With vows as their chief good, and final hope.
 Sight so deform what heart of Rock could long
 Dry-ey'd behold?

(XI, 477-495)

The only optimistic leaven throughout this history are the examples of devotion found in the great Patriarchs: Noah, Abraham, Moses and David. Yet the degradation of mankind at large is only magnified by their unwillingness to follow these examples. Milton's picture is so bleak that one can only concur with God's decisions to destroy the cities of Sodom and Gomorrah and to purge the earth of the human pestilence with the catastrophic Flood.

Thus, we see the depths to which man has sunk through disobedience to the primeval commandment. Instead of progress, Milton shows decay; instead of ever expanding life, Milton shows ubiquitous Death. Yet, Death is the price man must pay for this disobedience; the offense to God's majesty must be requited with Divine Justice. When the Son of God descends to Earth to pay this penalty as man's ransom, however, the Milton's view of society and of man changes radically. Michael describes to Adam part of the change effected by Christ's sacrifice:

But to the Cross he nails thy Enemies,
 The Law that is against thee, and the sins

Of all mankind, with him there crucifi'd,
 Never to hurt them more who rightly trust
 In this his satisfaction; so he dies,
 But soon revives, Death over him no power
 Shall long usurp; ere the third dawning light
 Return, the Stars of Morn shall see him rise
 Out of his gravve, fresh as the dawning light,
 Thy ransom paid, which Man from death redeems,
 His death for Man, as many as offer'd Life
 Neglect not, and the benefit embrace
 By Faith not void of works: this God-like act
 Annuls thy doom, the death thou shouldst have di'd,
 In sin forever lost from life;

(XII, 415-429)

Through Christ's sacrifice, hope returns to man's life: hope for the eternal life in Heaven that was man's initial promise in Eden. This promise is secured by Christ for the righteous man. Additionally, the Spirit of God aids the evangelists in spreading the Gospel by enduing them with miraculous powers in order to win men of all nations to Christianity. After this short span of manifest Divine intervention on behalf of man, however, the fight for righteousness and salvation devolves onto each individual man who must battle to progress spiritually in the face of unscrupulous prelates and the ever-present snares of Satan. Progress, again made possible by Christ and supported by Faith, can only be achieved through the determined efforts of man himself. While Michael's vision of man's future, as related to Adam, has its pessimistic moments, Milton, like Adam, comes out optimistic at the end.

Milton's closing lines, describing the exit of the first human couple from Eden, implicitly reflects this optimism in man's future:

They looking back, all th'Eastern Gate beheld
 Of Paradise, so late thir happy seat,
 Wav'd over by that flaming Brand, the Gate
 With dreadful faces throng'd and fiery Arms:
 Some natural tears they dropp'd, but wip'd them soon;
 The World was all before them, where to choose
 Thir place of rest, and Providence thir guide:
 They hand in hand with wand'ring steps and slow,
 Through Eden took thir solitary way.

(XII, 641-649)

If perhaps Milton's views of the ability of man to progress, and man's own personal contribution to that process, changes as he considers the differences between fallen and unfallen human nature, his emphasis on the free will of man is a constant throughout Paradise Lost, as it is a constant throughout his life and his works. Milton first forcefully states this doctrine in Book III of Paradise Lost, where God prophesies man's inevitable transgression and discusses its relationship to free will:

For Man will heark'n to his glozing lies,
 And easily transgress the sole Command,
 Sole pledge of his obedience: so will fall
 Hee and his faithless Progeny: whose fault?
 Whose but his own? ingrate, he had of mee

All he could have; I made him just and right,
 Sufficient to have stood, though free to fall.
 Such I created all th'Ethereal Powers
 And Spirits, both them who stood, and them who fail'd;
 Freely they stood who stood, and fell who fell.
 Not free, what proof could they have giv'n sincere
 Of true allegiance, constant Faith and Love,
 Where only what they needs must do, appear'd,
 Not what they would? what praise could they receive?
 What pleasure I from such obedience paid,
 When Will and Reason (Reason is also choice)
 Useless and vain, of freedom both despoil'd,
 Made passive both, had serv'd necessity,
 Not mee.

(III, 93-111)

Free will is the common patrimony man shares with the angelic powers. It dignifies his efforts, makes him capable of meriting praise or salvation and renders his worship of God sincere and upright. Without free will, man would stand merely as an automaton subservient to some higher power. This fundamental characteristic of man's nature is made abundantly clear to Adam by Raphael:

Attend: That thou art happy, owe to God;
 That thou continu'st such, owe to thyself,
 That is, to thy obedience; therein stand.
 This was that caution giv'n thee; be advis'd.

God made thee perfect, not immutable;
And good he made thee, but to persevere
He left in thy power, ordain'd thy will
By nature free, not over-rul'd by Fate
Inextricable, or strict necessity;

(VI, 520-528)

Man is free to persevere, free to choose, free to stand, free to fall. His actions are significant and make a difference. If there is going to be progress, no matter how one defines it - and Milton has his own definite ideas about the proper nature of human progress - it will depend on man's own perseverance, freely determined and freely executed.

Milton's insistence on free will forms a significant foundation to his theodicy, his attempt to justify the ways of God to man. In doing so, Milton stands in clear opposition to many historical and theological attempts to set man in his proper place in the divine cosmology. Of course, Milton's free will rejects entirely the pagan conception of fate, especially as seen in ancient Greek literature. For Milton, what God wills is Fate - and God clearly determines in Paradise Lost that man's choice will not be bound by strict necessity. His attitude toward the proper relationship between God and man certainly differs, at least in tone, from that of St. Augustine. There is no talk in Milton's works of man submitting himself blindly to the Will of God. Additionally, Milton rejects the doctrines of that great Protestant disciple of Augustine, John Calvin, who maintained that God predetermines the salvation of an elect few, regardless of their works or faith. Milton believes too deeply in the individual's responsibility for his own salvation and in the significance of action in this material world, not to mention his insistence

on man's free will, to accept such a doctrine, which formed the basis for much of Puritan thought. Finally, Milton categorically denies the subservience of man to some form of necessity supported by materialists like Hobbes, who believe that the mechanical nature of the universe, including man's own organs of sense and reason, predetermines man's actions by a chain of events begun long before the creation of human society. Milton possesses a unique perspective on the nature of man and society which upholds man's dignity and affirms the worth of his actions here on earth in the struggle to perfect himself and his society.

The Role of Learning

Given Milton's conviction in the perfectability of man, both before and after the Fall, and the esteem he places in the value of human efforts in securing this progress, he has very clear and specific ideas as to the proper role of learning in this vision of human progression. As we have seen in Of Education, Milton places great stock in the necessity and efficacy of a properly guided education in the formation of citizens fit for all offices of peace and war. Not surprisingly, this sentiment is echoed throughout Paradise Lost, almost exclusively through the media of angels sent by God to instruct Adam about the universe at large and about his own nature and future, both before and after his transgression of the sole divine commandment against eating the fruit of the Tree of Knowledge.

Milton presents learning as an invaluable assistance to Adam and Eve in maintaining their righteousness and in assuaging their fears and doubts about the world around them. God specifically sends the archangel Raphael to instruct Adam as to certain mysteries of the world in which Adam finds himself and to present to Adam a history of the cosmos before Adam's creation. In a very real sense, learning is a vital accessory to the exercise of man's free will. When ignorant of the possibilities of action confronting him and the ramifications of those actions, Adam is either hobbled, his free will effectively short-circuited, or he cannot be held responsible for his actions, a necessary prerequisite for a truly free will. Milton makes this aspect of learning and free will explicit in the commission which God gives to Raphael in sending him to converse with Adam in Eden's bower:

Converse with Adam, in what Bow'r or shade
 Thou finds't him from the Heat of Noon retir'd,
 To respite his day-labor with repast,
 Or with repose; and such discourse bring on,
 As may advise him of his happy state,
 Happiness in his power left free to will,
 Left to his own free Will, his Will though free,
 Yet mutable; whence warn him to beware
 He swerve not too secure: tell him withal
 His danger, and from whom, what enemy
 Late fall'n himself from Heaven, is plotting now
 The fall of others from like state of bliss;
 By violence, no, for that shall be withstood,
 But by deceit and lies; this let him know,
 Lest wilfully transgressing he pretend
 Surprisal, unadmonisht, unforewarn'd.

(V, 230-245)

Thus, the threat to Adam posed by Satan is an intellectual one, dealing with the nature of truth, and the exercise of free will requires the learning which Raphael will impart to the prime couple.

The importance of the proper kind of knowledge and its proper use is made so clear by Milton through Raphael's long discourse with Adam, with such a consistent emphasis and such a logical construction, that Milton should be left to speak for himself on this issue.

To ask or search I blame thee not, for Heav'n
Is as the Book of God before thee set,
Wherein to read his wondrous Works, and learn
His Seasons, Hours, or Days, or Months, or Years:
This to attain, whether Heav'n move or Earth,
Imports not, if thou reck'n right; the rest
From Man or Angel, the great Architect
Did wisely to conceal, and not divulge
His secrets to be scann'd by them who ought
Rather admire; or if they list to try
Conjecture, he his fabric of the Heav'ns
Hath left to thir disputes, perhaps to move
His laughter at thir quaint Opinions wide
Hereafter, when they come to model Heav'n
And calculate the Stars, how they will wield
The mighty frame, how build, unbuild, contrive
To save appearances, how gird the Sphere
With Centric and Eccentric scribbl'd o'er,
Cycle and Epicycle, Orb in Orb:

(VIII, 66-84)

This also thy request with caution askt
Obtain: though to recount Almighty works
What words or tongue of Seraph can suffice,
Or heart of man suffice to comprehend?
Yet what thou canst attain, which best may serve
To glorify the Maker, and infer

Thee also happier, shall not be withheld
Thy hearing, such Commission from above
I have receiv'd, to answer thy desire
Of knowledge within bounds; beyond abstain
To ask, nor let thine own inventions hope
Things not reveal'd, which th'invisible King,
Only Omniscient, hath suppress in Night,
To none communicable in Earth or Heaven:
Enough is left besides to search and know.
But Knowledge is as food, and needs no less
Her Temperance over Appetite, to know
In measure what the mind may well contain,
Oppresses else with Surfeit, and soon turns
Wisdom to Folly, as Nourishment to Wind.

(VII, 111-130)

Solicit not thy thoughts with matters hid,
Leave them to God above, him serve and fear;
Of other Creatures, as him pleases best,
Wherever plac't, let him dispose: joy thou
In what he gives to thee, this Paradise
And thy fair Eve: Heav'n is for thee too high
To know what passes there; be lowly wise:
Think only what concerns thee and thy being;
Dream not of other Worlds, what Creatures there
Live, in what state, condition, or degree,
Contented that thus far hath been reveal'd

Not of Earth only but of highest Heav'n.

(VIII, 167-178)

In these lines, we can see reflections of the intellectual tradition into which Milton fits so well, especially as demonstrated earlier in the synthesis based on charity constructed by Sir Thomas Browne. In particular, the idea that Nature represents God's second book of revelation, almost equal in validity to the written book of the Scriptures can be found in quotations cited earlier. Additionally, the idea that knowledge can aid man both in glorifying God and, equally importantly, in augmenting man's own personal happiness echoes similar statements by Browne which focus on the importance of achieving personal happiness through the worship of God.

Yet, Milton's attachment to learning as valuable and worthwhile in the achievement of a divine state of bliss differs substantially from Browne's essentially ambivalent attitude towards learning when considered in the cosmic scheme of things. Furthermore, Milton goes on to characterize desirable knowledge from profitless or proscribed knowledge. For him, knowledge clearly has its bounds which man must respect. Where the boundary exists between the two different degrees of knowledge is a little difficult to define, due to the magnanimous tolerance of God. The vision of an amused God laughing at the quaint theories of the cosmographers which is presented above typifies God's tolerance in the realm of human inquiry. It also contrasts sharply with the otherwise rather stern portrayal of God the Father throughout the rest of Paradise Lost, indicating the special niche Milton had in his heart for learning. Finally, it represents an apt commentary on the confused theories of cosmography under consideration at the time whose very complexity and

intricacy could probably baffle even the Divine Omniscience, or at least come close to doing so.

While the boundaries separating valuable from proscribed knowledge are somewhat ambiguous, Milton gives us an intuitive grasp concerning the nature of approved learning when he advises us through Raphael to "be lowly wise." In other words, man must concern himself with his own personal salvation and with the salvation of those around him. The righteous direction of one's personal life and the righteous constitution of society at large must be the principal concerns of man on earth. Knowledge, properly sought and properly applied can aid in this endeavor. But it can also distract man from his true goal and even tempt man to arrogate the prerogatives of divinity to himself. Thus, knowledge and its pursuit must be carefully integrated into a hierarchy of values in which knowledge is good, but faith is better; in which the search for wisdom can be valuable, but obedience to God's commandment is necessary.

Given this careful characterization of the value of knowledge and learning and its proper position in a hierarchy of spiritual, Christian values, Milton's treatment of the proscription placed by God on the Tree of Knowledge becomes an appropriate metaphor for the temptations presented by wisdom to intemperate man. The knowledge of Good and Evil with which the tree is invested is essentially a divine attribute which man has no right to arrogate to himself. This temptation of wisdom finds full expression in Satan's temptation of Eve:

Why then was this forbid? Why but to awe,
Why but to keep ye low and ignorant,
His worshippers; he knows that in the day

Ye Eat thereof, your Eyes that seem so clear,
 Yet are but dim, shall perfectly be then
 Op'n'd and clear, and ye shall be as Gods,
 Knowing both Good and Evil as they know.

(IX, 703-709)

It is this arrogant desire to supplant or at least equal God which Milton views as the greatest temptation presented to man by knowledge.

To further elaborate on his ideas regarding knowledge and learning and its proper use, Milton presents his readers with archetypes representing both poles of this argument. First, we find early in Paradise Lost an example of the proscribed or at least fruitless learning achieved by the fallen angels in the degradation of their hellish imprisonment. In order to pass the time while Satan ventures forth into Chaos to seek the newly created World and suborn its sole occupants, we find several of the demons engaged in philosophical debate:

. . . In discourse more sweet
 (For Eloquence the Soul, Song charms the Sense,)
 Others apart sat on a Hill retir'd,
 In thoughts more elevate, and reason'd high
 Of Providence, Foreknowledge, Will and Fate,
 Fixt Fate, Free will, Foreknowledge absolute,
 And found no end, in wand'ring mazes lost.
 Of good and evil much they argu'd then,
 Of happiness and final misery,
 Passion and Apathy, glory and shame,
 Vain wisdom all, and false Philosophie:

Yet with a pleasing sorcery could charm
 Pain for a while or anguish, and excite
 Fallacious hope, or arm th'obdured breast
 With stubborn patience as with triple steel.

(II, 555-569)

Clearly, the demons are debating issues long before settled by God in his ordering of the cosmos. Their wisdom is vain, their philosophy false. This type of search for knowledge can only result in the hardening of already obdured hearts against the word and the way of God.

As an example of the subordination of knowledge to obedience to God, Milton presents us with the character of Abdiel. Originally an angel of Satan's cohort in heaven, Abdiel sternly refuses to join in Satan's rebellion against God, rejecting both his learned arguments and the violent partisan coercion of the rest of the satanic throng:

. . . Abdiel faithful found,
 Among the faithless, faithful only hee;
 Among innumerable false, unmov'd,
 Unshak'n, uneduc'd, unterrifi'd
 His loyalty he kept, his Love, his Zeal;
 Nor number, nor example with him wrought
 To swerve from truth, or change his constant mind
 Though single. From amidst them forth he pass'd,
 Long way through hostile scorn, which he sustain'd
 Superior, nor of violence fear'd aught;
 And with retorted scorn his back he turn'd

On those proud Tow'rs to swift destruction doom'd.

(VI, 896-907)

The truth Abdiel upholds is the eternal truth of obedience to God's commandment. God himself commends Abdiel upon his return to a more hospitable abode:

Servant of God, well done, well hast thou fought
 The better fight, who single hast maintain'd
 Against revolted multitudes the Cause
 Of Truth, in word mightier than they in Arms;
 And for the testimony of Truth hast borne
 Universal reproach, far worse to bear
 Than violence: for this was all thy care
 To stand approv'd in the sight of God, though Worlds
 Judg'd thee perverse:

(VI, 29-37)

This paragon of obedience epitomizes the proper hierarchy of values, the proper use of knowledge, the proper value of learning. Any exaltation of learning beyond this point by man leads inevitably to arrogance and impiety; an impiety profoundly symbolized in Eve's worship of the Tree of Knowledge after eating of its fruit:

O Sovran, virtuous, precious of all Trees
 In Paradise, of operation blest
 To Sapience, hitherto obscur'd, infam'd

And thy fair Fruit let hang,as to no end
Created; but henceforth my early care,
Not without Song, each Morning, and due praise
Shall tend thee,

(IX, 795-801)

This idolatry, the first of all the sins later proscribed by God, results from succumbing to the temptation of arrogance which the pursuit of knowledge for any sake other than the right ordering of life on earth will lead to.

Sensitivity to the "New Philosophy"

While belief in the perfectability of man and in the efficacy of learning and knowledge form necessary conditions for the acceptance of the "New Philosophy," they are not, in and of themselves, sufficient to prove that acceptance on Milton's part or to define the nature of that acceptance. In many respects, the Cambridge Platonists believed in both of these principles, yet they remained in an intellectual backwater in the history of thought due to their antipathy to empirical science. In contrast, Milton's reaction to the "New Philosophy" is subtle and profound. In many important respects, it serves to organize his thoughts and finds expression in his poetic imagery.

This is not to say that Milton was an empirical scientist in his own right. This is clearly not the case. In fact, Milton, for all of his learning, exhibits a curious ignorance about some of the scientific techniques whose development and refinement stand out as outstanding accomplishments of seventeenth century England. This is first significant in Of Education. Despite Milton's insistence on the necessity of a scientific education and other practical experiences, this education is based primarily on classical authors using classical techniques. There is no of discussions of Gilbert's magnetism, Harvey's theories about the circulation of the blood or Bacon's new system of experimental natural philosophy. In fact, in an important respect, Milton's mode of thought contrasted sharply with that of Bacon, the most respected scientific spokesman of the day. Bacon espoused induction as the proper scientific thought pattern; Milton, in consonance with his primary interest in fields such as logic, theology and politics, was a deductive thinker. This point can be overemphasized. Hobbes, a radical materialist who

embraced wholeheartedly the results of the "new philosophy," also thinks deductively and, despite Bacon's rejection of deduction, it plays an important part in modern scientific practice. Yet, all of the evidence points to the conclusion that Milton was not a scientific thinker, that he did not exhibit any significant curiosity into the fine structure of the universe and that he ignores, at least in his principal works, some of the more important scientific discoveries of his era. (Babb, p. 24) This prompts us to look deeper into his work to bring to light the more subtle influence exerted on Milton by the "New Philosophy."

The most fruitful area of inquiry available to us is the consideration of Milton's cosmology in Paradise Lost. By cosmology, I mean more than the simple schematic layout of the universe. In fact, in Paradise Lost, Milton employs a basically Ptolemaic system as the basis for the structure of his universe. In doing so, he rejects using the Copernican system which had been known, if not universally accepted, since 1543. But Milton's reaction to the new empirical science goes beyond his acceptance or rejection of some of its hypotheses or results. Instead, I would like to consider the grandiloquent scope and dynamic nature of Milton's cosmos and its roots in the "New Philosophy."

As an introduction to this particular topic, Murray Roston in his book Milton and the Baroque places Milton firmly in the mainstream of Baroque art which had as its primary scientific inspiration the Copernican heliocentric cosmology. (Roston, p. 8) In particular, the Copernican theory, in addition to proposing a new astronomical system to rectify aberrations in astronomical observations, carried with it a whole series of corollaries which shook man from his previously static and rigidly hierarchical view of the universe. For example, Copernicus' hypothesis carried with it the elimination of the heavenly spheres, the possibility of a multitude of inhabited worlds (to which

Raphael alludes in his discourse on the proper role of knowledge), the mutability of the heavens (which was proved by Tycho Brahe's discovery of a new star in the firmament in 1572), (Babb, p. 10) and most importantly the idea of an infinite universe in constant and intricate motion.

This last point, according to Roston, provides Baroque artists with much of their inspiration and artistic models. The most vivid and most accessible examples of this inspiration are embodied in Baroque architecture, particularly church architecture. Baroque architects use several techniques to impress a viewer of their work with its massive size and proportions. Whereas a Gothic cathedral makes use of such elements as slender arches and stained-glass windows leading up to vaults of delicate fan tracery, the Baroque cathedral emphasizes its size through heavy barrel vaulting, large domes which visually seem to press down burdensomely upon equally large supporting pillars, and countless friezes, niches, arcades, votive statues, marble slabs and stone balustrades. To focus our attention even more precisely, the Baroque use of the cornice combined with the characteristic Baroque dome illustrates the impact of the Copernican hypothesis on Baroque art. Originally simply a device topping a pillar and connecting it with the ceiling which the pillar supports, Baroque architects greatly expanded the cornice into a kind of ledge running around the interior of their cathedrals. Providing lodgment for statues, the cornice also visually split the cathedral's interior horizontally, separating the "earthly" nave from the "cosmic" dome and thus directing man's attention visually upward. This redirection of man's gaze was accentuated by the Baroque practice of leaving the walls below the cornice windowless while placing numerous small lunettes just above the cornice which admitted light to the upper regions of the cathedral, especially the dome. (Roston, pp. 19-21)

Roston also documents other examples of the integration of elements of Copernican thought into Baroque art. For example, the sun becomes a central symbol, appropriately enough, of Baroque artists. In Jesuit churches, the order's insignia was often displayed emblazoned within the sun. Bernini's stained glass window above the altar in St. Peter's basilica depicts the Holy Spirit, in the form of a dove, descending in a solar disc. (Roston, p. 22) In another example, the very structure of the Copernican solar system provides inspiration for church architects. Previous to the discoveries of Johannes Kepler, the orbits of the planets had been conceived of as circles, the perfect geometric form of the Neo-Platonic Renaissance. In 1611, Kepler discovered that the planetary orbits in the Copernican solar system actually corresponded to ellipses. Baroque architects quickly integrated this new cosmological geometry into their churches, replacing the circles of the Renaissance. Two examples cited by Roston are Borromini's church of S. Carlo alle Quattro Fontane, built in Rome in 1638, and Bernini's S. Andrea al Quirinale, begun in Rome a few years after Borromini's church. (Roston, pp.23-24) In Baroque art, Roston finds the principles of cosmic infinitude and a kind of mobile equilibrium which form the intellectual foundation of the most important and prominent scientific discoveries of the "new philosophy," the Copernican heliocentric universe.

Milton clearly and forcefully shares these sympathies of Baroque art and expresses them in Paradise Lost. The very purpose of the epic, to justify God's ways to man, represents a lofty and ambitious goal worthy of a Baroque artist. In his depiction of the action in his cosmos, the reader is struck again and again by its vast scope and continual motion. Milton takes us from the wide regions of Heaven to the capacious dungeon of Hell, while taking time to describe the fallen angels' tumultuous descent through the nethermost abyss

of Chaos and ancient Night. Raphael, in his many discourses with Adam, describes the huge and furious internecine war in Heaven and the magnificent creation of this world by God. In his choice of subject matter, Milton evinces the essentially Baroque nature of his sensibility.

In his imagery, Milton continues to display his Baroque attitude toward space and motion. So many magnificent examples of this imagery abound in Paradise Lost that choosing representative examples is made difficult by their profusion. The following examples will have to suffice. Milton's depiction of Hell in Book I not only intimates the space and motion to come, but also incorporates the light imagery important to Baroque artists in a manner which dramatically demonstrates the depth of Satan's fall:

. . . Him the Almighty Power
 Hurl'd headlong flaming from th'Ethereal Sky
 With hideous ruin and combustion down
 To bottomless perdition, there to dwell
 In Adamantine Chains and penal Fire,
 Who durst defy th'Omnipotent to arms.
 Nine times the Space that measures Day and Night
 To mortal men, hee with his horrid crew
 Lay vanquish, rolling in the fiery Gulf
 Confounded though immortal: But his doom
 Reserv'd him to more wrath; for now the thought
 Both of lost happiness and lasting pain
 Torments him; round he throws his baleful eyes
 That witness'd huge affliction and dismay
 Mixed with obdurate pride and steadfast hate:

At once as far as Angels' ken he views
 The dismal situation waste and wild,
 A Dungeon horrible, on all sides round
 As one great Furnace flam'd, yet from those flames
 No light, but rather darkness visible
 Serv'd only to discover sights of woe,
 Regions of sorrow, doleful shades, where peace
 And rest can never dwell, hope never comes
 That comes to all; but torture without end
 Still surges, and a fiery Deluge, fed
 With ever-burning Sulphur unconsum'd:

(I, 44-69)

For comparison, consider the following descriptions of the realm of Heaven and the nature of the divine creatures that inhabit it when God calls together his ministering angels:

. . . Th'Empyreal Host
 Of Angels by imperial summons call'd,
 Innumerable before th 'Almighty throne
 Forthwith from all the ends of Heaven appear'd
 Under thir Hierarchs in orders bright;
 Ten thousand thousand Ensigns high advanc'd,
 Standards and Gonfalons, twixt Van and Rear
 Stream in the Air, and for distinction some
 of Hierarchies, of Orders and Degrees;
 Or in thir glittering Tissues bear imblazon'd

Holy Memorials, acts of Zeal and Love
 Recorded Eminent. Thus when in Orbs
 Of circuit inexpressible they stood
 Orb within Orb, the Father infinite
 By whom in bliss imbosom'd sat the Son.
 Amidst as from a flaming Mount, whose top
 Brightness had made invisible, thus spake . . .

(V, 583-599)

The Baroque sense of space is also evoked by God when giving his Son the commission to create the new world which man will inhabit:

And thou my Word, begotten Son, by thee
 This I perform, speak thou, and be it done:
 My overshadowing spirit and might with thee
 I send along, ride forth, and bid the Deep
 Within appointed bounds be Heav'n and Earth,
 Boundless the Deep, because I am who fill
 Infinitude, nor vacuous the space.

(VII, 164-169)

Adam himself expresses Baroque admiration of and astonishment at the infinitude of space and the motion of the universe:

When I behold this goodly Frame, this World
 Of Heav'n and Earth consisting, and compute

Thir magnitudes, this Earth a spot, a grain,
 An Atom, with the Firmament compar'd
 And all her number'd stars, that seem to roll
 Spaces incomprehensible (for such
 Thir distance argues and thir swift return
 Diurnal) merely to officiate light
 Round this opacous Earth, this punctual spot,
 One day and night; in all their vast survey
 Useless besides; reasoning I oft admire,
 How nature wise and frugal could commit
 Such disproportions, with superfluous hand
 So many nobler bodies to create,
 Greater so manifold to this one use,
 For aught appears, and on thir Orbs impose
 Such restless revolutions day by day
 Repeated, while the sedentary Earth,
 That better might with far less compass move,
 Serv'd by more noble than herself, attains
 Her end without least motion, and receives,
 As Tribute such a sumless journey brought
 Of incorporeal speed, her warmth and light;
 Speed, to describe whose swiftness Number fails.

(VIII, 15-38)

In each of these passages, Milton expresses the fascination with the infinite that characterizes Baroque art of all types and that typifies the scientific thought of the age. This "dark with excessive bright," these "restless

revolutions," these "Spaces incomprehensible," Nature's "superfluous hand," this "Speed, to describe whose swiftness Number fails," all typify Milton's approach to the universe around him which document his central empathy to the approaches and attitude of the "new philosophy."

There is another motif consistently used throughout Paradise Lost which also serves to illustrate this relationship between Milton and the "new philosophy" which incorporates the empiric concerns with motion into the society of both men and the angels which I call "reactionary imagery." In using this pattern, Milton presents action versus reaction as an organizing principle of his poem. This pattern first manifests itself in the character of Satan, who vows to reduce all the creations of God's goodness to degradation and perversion. Out of goodness, he seeks to create evil; from among the ranks of God's newly created race on earth, he seeks further inmates for Hell; among God's immortal beings, he seeks to instill Death. This reaction against God's goodness is met by a divine determination to turn evil back against itself:

Only begotten Son, seest thou what rage
 Transports our adversary, whom no bounds
 Prescrib'd, no bars of Hell, nor all the chains
 Heapt on him there, nor yet the main Abyss
 Wide interrupt can hold; so bent he seems
 On desperate revenge, that shall redound
 Upon his own rebellious head.

(III, 80-86)

Far off and fearless, nor with cause to boast,
 Begins his dire attempt, which nigh the birth
 Now rolling, boils in his tumultuous breast,
 And like a devilish Engine back recoils
 Upon himself;

(IV, 14-18)

. . . but the evil soon
 Driv'n back redounded as a flood on those
 From whom it sprung, impossible to mix
 With Blessedness.

(VII, 56-59)

The angels in heaven rejoice in God's goodness and express their admiration of his goal to bring good out of evil:

. . . easily the proud attempt
 Of spirits apostate and thir Counsels vain
 Thou hast repell'd, while impiously they thought
 Thee to diminish, and from thee withdraw
 The number of thy worshippers. Who seeks
 To lessen thee, against his purpose serves
 To manifest the more thy might: his evil
 Thou usest, and from thence creat'st more good.

(VII, 609-616)

In many respects, this dynamic, reactionary principle forms the foundation for the final discussion in the epic between the archangel Michael and Adam when they consider what has been termed the doctrine of the felix culpa, or happy Fall. This doctrine states that mankind's Fall from Divine Grace, while unfortunate in the short run, makes possible the greatest and most glorious of God's acts of love, the incarnation and sacrifice of Jesus Christ. Adam expresses his joy and rapture over this possibility in the final book of the poem in a passage which echoes both the reactionary imagery and the sense of infinity cited above:

O goodness infinite, goodness immense!
 That all this good of evil shall produce,
 And evil turn to good; more wonderful
 Than that which by creation first brought forth
 Light out of darkness! full of doubt I stand,
 Whether I should repent me now of sin
 By mee done and occasion'd, or rejoice
 Much more, that much more good thereof should spring,
 To God more glory, more good will to Men
 From God, and over wrath grace shall abound.

(XII, 469-478)

Thus, the action and dynamism which the Baroque artists saw in the universe whose outlines were being sketched by the "new philosophers" found a fervent

and imaginative disciple in John Milton. Not only does he view the universe around him as infinite, boundless and moving with a "speed almost spiritual," (VIII, 110) but he also views society in these same dynamic terms. The principle of action and reaction, of motion inducing further motion is central to Milton's thought. In the divine scheme of things, this action and reaction enables God to make his glory, power and love manifest to all of his creatures. In that sense, motion and action are attributes devoutly to be wished.

This rejection of stasis in favor of dynamism on Milton's part makes possible the sympathetic aesthetic response on his part to the "new philosophy." As we have seen in our exploration of Milton's belief in and devotion to human progress, Milton views change in man and in society as a basically desirable attribute, provided that it is properly directed. In Paradise Lost, we have already seen that man was made "perfect not immutable." In the cosmos of Paradise Lost, we are presented with numerous examples of change: Satan's fall; the elevation of the Son of God to the position of vice-regent of the universe, the creation of the world and its inhabitants; the fall of man and his banishment from Eden. These examples, which show us that change can bring both good and evil into the universe, serve to emphasize the point already made that a proper hierarchy of values married to an in-depth knowledge of the world are necessary to the achievement of the good by man on earth. They do not invalidate change as a central and positive principle in the universe. On the contrary, Raphael, in describing the conditions in Heaven to Adam, terms the change that occurs in Heaven as "delectable" (V, 630).

In considering this espousal of change and dynamism on Milton's part, it is useful to contrast his view of the divine order and nature with a more

specifically Renaissance view. As an example, consider the following description of God and his ordering of the world which is found in Spenser's "Hymne of Heavenly Love":

His throne is built upon Eternity,
 More firm and durable than steele or brasse,
 Or the hard diamond, which them both doth passe.
 His scepter is the rod of Righteousness,
 With which he bruseth his foes to dust,
 And the great Dragon strongly doth repress,
 Under the rigour of his judgement just;
 His seat is Truth, to which the faithfull trust;
 From whence proceed her beames so pure and bright,
 That all about him sheddeth glorious light.

(ll. 152-161)

Spenser's God has a static, hierarchical quality. Unlike Milton's God, Spenser's is not shown in the process of moving or of acting or of creating, attributes with which Milton dealt with in depth. (Roston, p. 41)

Furthermore, Spenser's God admits of no change, of no progress. His throne is more firm than diamond, eternal and unchanging. Compare this with the vivid picture of change which Milton's God figures forth when he prophesies the apocalypse and its aftermath to his Son:

Then all thy saints assembl'd, thou shalt judge
 Bad men and Angels, they arraign'd shall sink
 Beneath thy Sentence; Hell, her numbers full,
 Thenceforth shall be for ever shut. Meanwhile
 The World shall burn, and from her ashes spring
 New Heav'n and Earth, wherein the just shall dwell
 And after all thir tribulations long
 See golden days, fruitful of golden deeds,
 With joy and love triumphing, and fair Truth
 Then thou thy regal Sceptre shalt lay by,
 For regal Sceptre then no more shall need,
 God shall be All in All.

(III, 330-341)

In this vision, even God himself will change his nature, when he becomes "All in All." Although Milton's ideas about the nature of this change are somewhat obscure, the term "All in All" being open to numerous interpretations, it is this picture of change in even the perfect, divine nature which I find to be important. A man such as Milton who could envision with eager anticipation such a change in the divine order could certainly be at ease with the changes in man's perception of the universe which was being brought about through the efforts of the new philosophers.

As a final topic, I would like to consider Milton's reaction to empiricism as a means of approaching the world around us. The "New Philosophy" was, after all, an empirical philosophy which emphasized reliance upon the evidence presented to man by the senses. Milton's reaction to this exclusively

sensuous apprehension of knowledge reflects the same concerns and ambiguities which typify his reaction to the issue of knowledge and learning in general which we discussed earlier.

As a starting point, Paradise Lost is a poem in which human sensuousness finds beautiful and poignant poetic expression. Contrary to his somewhat stuffy, Puritan reputation and despite his blindness at the time he composed the poem, Paradise Lost abounds in beautiful sensual images. Milton's descriptions of Eve are among the most important:

Shee as a veil down to the slender waist
 Her unadorned golden tresses wore
 Dishevell'd, but in wanton ringlets wav'd
 As the Vine curls her tendrils, which impli'd
 Subjection, but requir'd with gentle sway,
 And by her yielded, by him best received,
 Yielded with coy submission, modest pride,
 And sweet reluctant amorous delay.

(IV, 304-311)

Milton goes on to describe the daily pastime of the prime couple in Eden in equally sensuous terms:

Under a tuft of shade that on a green
 Stood wispering soft, by a fresh Fountain side
 They sat them down, and after no more toil

Of thir sweet Gard'ning labor than suffic'd
 To recommend cool Zephyr, and made ease
 More easy, wholesome thirst and appetite
 More grateful, to thir supper Fruits they fell,
 Nectarine Fruits which the compliant boughs
 Yielded them, side-long as they sat recline
 On the soft downy Bank damask't with flow'rs:
 The savory pulp they chew, and in the rind
 Still as they thirsted scoop the brimming stream;
 Nor gentle purpose, nor endearing smiles
 Wanted, nor youthful dalliance as beseems
 Fair couple, linkt in happy nuptial League,
 Alone as they.

(IV, 325-340)

There are numerous additional examples, not only describing earthly creatures and events in sensuous terms, such as these examples describing Adam and Eve, but also descriptions of heavenly settings. The war in heaven, for example, abounds in such sensuous images. Consider the following quotation, wherein Satan's fiendish crew uses their newly created invention, artillery, to do battle against God's heavenly host:

. . . those deep-throated Engines belcht, whose roar
 Embowell'd with outrageous noise the Air,
 And all her entrails tore, disgorging foul
 Thir devilish glut, chain'd Thunderbolts amid Hail
 Of Iron Globes, which on the Victor Host

Levell'd, with such impetuous fury smote,
 That whom they hit, none on thir feet might stand,
 Though standing else as Rocks, but down they fell
 By thousands, Angel on Arch-Angel roll'd;

(VI, 586-594)

Be sure that God's champions repay such treatment with an equally sensuously described counterattack:

Thir Arms away they threw, and to the Hills
 (For Earth hath this variety from Heav'n
 Of pleasure situate in Hill and Dale)
 Light as the Lightning glimpse they ran, they flew,
 From thir foundations loos'ning to and fro
 They pluckt the seated Hills with all thir load,
 Rocks, waters, Woods, and by the shaggy tops
 Uplifting bore them in thir hands: Amaze
 Be sure, and terror seized the rebel Host,
 When coming towards them so dread they saw
 The bottom of the Mountains upward turn'd,

(VI, 639-649)

Milton thus possesses an aesthetic appreciation for matter and for the information provided by the senses which he poetically embodies in Paradise Lost. This appreciation is manifest both on heaven and on the earth, thus impressing on sensuousness a divine imprimatur.

Milton goes beyond this fundamental artistic attachment to sensuousness to consider the role of empiricism in knowledge and learning. In general, Milton echoes the sentiments of Bacon relating to the importance that empiric experience must play in the intellectual development of man. In particular, consider the important role given to empiricism in guiding man's learning expressed by Adam to Raphael during one of their many conversations before the Fall:

But apt the Mind or Fancy is to rove
 Uncheckt, and of her roving is no end;
 Till Warn'd, or by experience taught, she learn
 That not to know at large of things remote
 From use, obscure and subtle, but to know
 That which before us lies in daily life,
 Is the prime Wisdom; what is more, is fume,
 Or emptiness, or fond impertinence,
 And renders us in things that most concern
 Unpractic'd, unprepar'd, and still to seek.

(VIII, 188-197)

Here we find Bacon's sentiments regarding the tendencies of the unguided mind, his appeal to experience as the proper guide and his concern with intermediate forms of knowledge which can be immediately applied to benefit the world of man all echoed by Milton's Adam. Of course, the stated goals of Bacon and Milton are different. Bacon seeks only control over the material world around

him, or at least that's the goal which he is willing to state publicly. Milton's goal is aptly summarized by Adam in an earlier conversation with Raphael:

O favorable Spirit, propitious guest,
 Well hast thou taught the way that might direct
 Our knowledge, and the scale of Nature set
 From centre to circumference, whereon
 In contemplation of created things
 By steps we may ascend to God.

(V, 507-512)

In this ascent to communion with God, the "contemplation of created things" forms a sound foundation of knowledge. This empiric dedication to "things" which Francis Bacon forcefully expounds can be found in Milton's Paradise Lost as a proper and effective means by which God can be apprehended. In this respect, Milton shares a common methodology with the "New Philosophers."

Unlike Bacon and the "New Philosophers," however, Milton does not wholeheartedly endorse empiricism as man's only effective aid in progressing upward from our present state. His reservations concerning empiricism closely parallel his reservations concerning learning and knowledge in general. They are best illustrated through Milton's treatment of Satan's temptation of Eve. Having taken the appearance of a serpent, Satan approaches Eve while she is separated from Adam and tending to some gardening tasks in Paradise. She is surprised by the serpents ability to talk, for no other animal in Eden has exhibited this talent before. Satan then leads her to the Tree of Knowledge,

explains to her that his vocal power derived from his eating of the tree's fruit and then exhorts her to eat of its fruit as well with the following oration:

O Sacred, Wise, and Wisdom-giving Plant,
 Mother of Science, Now I feel thy Power
 Within me clear, not only to discern
 Things in thir Causes, but to trace the ways
 Of highest Agents, deem'd however wise.
 Queen of this Universe, do not believe
 Those rigid threats of Death, ye shall not Die:
 How should ye? by the Fruit? it gives you Life
 To Knowledge: By the Threat'ner? look on mee,
 Mee who have touch'd and tasted, yet both live,
 And life more perfet have attain'd than Fate
 Meant mee, by vent'ring higher than my Lot.

(IX, 679-690)

While there are a lot of influences acting on Eve during this temptation, including Satan's appeal to her incipient narcissism and his exhortation for her to join the ranks of the angels by eating the fruit, the temptation, at its very foundation, is an empiric one. Satan exhorts Eve to believe the evidence of her senses; the serpent has not died from eating the fruit, in fact he has raised himself up the great chain of being. He implores Eve to believe her empiric knowledge and eat of the fruit proscribed by God. In this manner, the temptation of arrogance inherent in all knowledge is also extended to empiric knowledge. Eve had only to refuse based on God's simple and clear

commandment - she chose instead to trust in her senses rather than in God's word. The result was Death. No clearer and more forceful illustration of the deceptive nature of man's unaided reason and of the temptation presented to man by knowledge, and particularly empiric knowledge, exists in Paradise Lost.

In the end, then, Milton subordinates empiricism to the foremost of his values, obedience to God's word. After the fall, Milton depicts man as having lost the innocent sensuousness which he had earlier possessed. Adam and Eve engage in lustful sex, as opposed to their earlier enjoyment of "the Rites mysterious of connubial Love" (IV, 742-743) Their shame at their acts provokes them to hide their bodies, which before had provided them with so much enjoyment and had enabled Milton to display his own sensuous aestheticism. But matter itself is not corrupt, though it can be suborned to corrupt uses by fallen man. In a sense, Milton's empiricism, such as it is, derives from his belief in a subtle gradation from matter to spirit, a spectrum created and blessed by God. This spirit-matter spectrum is symbolized in the following passage:

O Adam, one Almighty is, from whom
 All things proceed, and up to him return,
 If not depriv'd from good, created all
 Such to perfection, one first matter all,
 Indu'd with various forms, various degrees
 Of substance, and in things that live, of life;
 But more refin'd, more spirituous, and pure,
 As nearer to him plac't or nearer tending
 Each in thir several active Spheres assign'd,

Till body up to spirit work, in bounds
 Proportion'd to each kind. So from the root
 Springs lighter the green stalk, from thence the leaves
 More aery, last the bright consummate flow'r
 Spirits odorous breathes:

(V, 469-482)

Milton feels comfortable with an empiric appreciation of Nature because for him matter forms an integral part of God's beneficent creation. The information provided by the senses is to be enjoyed and, when properly guided and subordinated to God's word, it can be an invaluable assistance to man in his search for knowledge. Using this knowledge combined with this faith, man can eventually move up the spectrum depicted above towards the more spiritual existence of God and the angels. This integration of matter and spirit into one comprehensive view of the universe enables Milton to embrace and celebrate empiricism to the limits approved by God. For him, the "New Philosophers," with their emphasis on empiricism did not, in and of themselves, pose a threat to his religious and moral beliefs. Rather, they were pursuing knowledge in a fashion of which Milton approves. Milton's real concern is that these "New Philosophers," like any group dedicated to expanding man's knowledge of and control over the world around him, would forget the limits to man's ability to use this knowledge and, in the process, violate the word of God in the same way Eve does in Eden.

Paradise Regained - A Miltonic Reprise

In Paradise Lost, Milton sets forth his ideas relative to human progress, knowledge, empiricism and the "new philosophy" in their fullest and most complete form. Paradise Lost is noted for the richness of its texture, the majesty of its language, the epic quality of its action and the fullness of its scope. In comparison, Paradise Regained is a much more spare and restrained work. It concentrates on one brief period in human history, the temptation of Christ in the Desert by Satan. Yet, in this relatively brief poetic work, Milton restates and confirms in a dramatic and forceful manner his conclusions about the proper role of knowledge in a hierarchy of human values.

As the medium to convey these conclusions, Milton chooses to dramatize the event which, in his own peculiar and heterodox view of Christianity, regains for man the promise of paradise originally lost through the transgressions of Adam and Eve. Milton begins Paradise Regained with a succinct statement of his theme:

I who erewhile the happy Garden sung,
 By one man's disobedience lost, now sing
 Recover' Paradise to all mankind,
 By one man's firm obedience fully tried
 Through all temptation, and the Tempter foil'd
 In all his wiles, defeated and repuls't,
 And Eden rais'd in the waste Wilderness.

(I, 1-7)

Thus, the Son of God in human guise will win back for mankind the grace of God by his constant obedience to God's commandments. While this clearly hearkens back to Milton's discussion of the necessity of Adam and Eve's obedience to God's word in the Garden of Eden in order for them to progress to their proper place as the replacements for Satan's fallen cohort, it represents an abrupt departure from orthodox Christianity's view of man's salvation. In the accepted formula, Christ wins man's salvation through his suffering and sacrifice on the Cross at Calvary. Milton's inability to deal with this subject is noteworthy. He only briefly glosses over it during God's prophecy of man's redemption in Paradise Lost and, while Milton wrote a beautiful poem dealing with Christ's birth, he could not finish a companion poem dealing with Christ's suffering on the Cross. Milton is more concerned with Christ's intellectual temptation than with his physical suffering. Given this unique view of redemption, the role that learning and wisdom play in Christ's own life provides us with a model for the proper application of these intellectual talents in human society.

Given Milton's insistence on finding man's redemption in the obedience of the Son of God in his human incarnation, it is interesting to compare Jesus in Paradise Regained with Adam in Paradise Lost. In doing so, we find Jesus in an almost exactly analogous situation to Adam's. At this point, Jesus is a private person, having just been baptized in the Jordan and not having yet begun his public mission on earth. As such, he is poised on the path of human progress, much like Adam is poised on a similar path in Eden. Up to this point, Jesus has actively sought out knowledge and wisdom in anticipation of some future, public role:

When I was a child, no childish play

To me was pleasing, all my mind was set
Serious to learn and know, and thence to do
What might be public good; myself I thought
Born to that end, born to promote all truth,
All righteous things: therefore above my years,
The Law of God I read, and found it sweet,
Made it my whole delight, and in it grew
To such perfection that, ere yet my age
Had measur'd twice six years, at our great Feast
I went into the Temple, there to hear
The Teachers of our Law, and to propose
What might improve my knowledge or their own:

(I, 201-213)

This compares quite closely to Adam's own search for knowledge through the agency of the archangel Raphael, who teaches him all that he needs to know about the Universe and his own human nature. Finally, Christ is subjected to a temptation by Satan, much like Adam and Eve in the Garden. Thus, Christ, "this perfect Man" (I, 166) is found in a condition and in a set of circumstances almost exactly analogous to that of Adam in Paradise before the Fall. His response to Satan's temptation provides us with the supreme example of human perfection and right conduct.

Satan's temptations of Christ are many and varied; they can, however, be grouped into three distinct attempts on Christ's virtue. The first temptation consists of Satan's challenge to Christ to perform a miracle in the desert to save himself from starvation. Satan offers this challenge disguised in "rural weeds," but Christ immediately discerns his true nature and easily rebuffs

him. Satan then reverses the nature of his temptations and tests Christ by offering to perform various miracles on his behalf in order to win for Christ earthly dominion. Satan's temptations progress from the trivial to the grandiose, beginning with a simple offer of food for a hungry Christ to a more grandiose and impudent offer:

The Kingdoms of the world to thee I give;
For giv'n to me, I give them to whom I please,
No trifle; yet with this reserve, not else,
On this condition, if thou wilt fall down,
And worship me as thy superior Lord,
Easily done, and hold them all of me;
For what can less so great a gift deserve?

(IV, 163-169)

Christ sternly refuses this temptation as he answers "with disdain":

I never liked thy talk, thy offers less,
Now both abhor, since thou hast dar'd to utter
Th'abominable terms, impious condition;
But I endure the time, till which expir'd,
Thou hast permission on me.

(IV, 171-175)

Satan, confounded, now moves on to the final and most potent of his second round of temptations, the temptation of learning:

. . . Be famous then
 By wisdom; as thy Empire must extend,
 So let thy mind o'er all the world,
 In knowledge, all things in it comprehend.
 All knowledge is not couch't in Moses' Law,
 The Pentateuch or what the Prophets wrote;
 The Gentiles also know, and write, and teach
 To admiration, led by Nature's light;
 And with the Gentiles much thou must converse,
 Ruling them by persuasion as thou mean'st,
 Without thir learning how wilt thou with them,
 Or they with thee hold conversation meet?
 How wilt thou reason with them, how refute
 Thir Idolisms, Traditions, Paradoxes?
 Error by his own arms is best evinc't.

(IV, 221-235)

Satan then goes on to document the learning of the Gentiles, listing Plato, Socrates, Homer, Aristotle and Epicurus in his literary inventory of learned men and their famous doctrines. It is easy to conceive of the power of this temptation from Milton's point of view. In Of Education, he advocates the use of these same ancient fonts of wisdom in the instruction of his young pupils. Milton himself engaged in many long years of such an education, both at Cambridge and on his own at his father's retirement retreat. Earlier in Paradise Regained, Milton describes Christ's own juvenile yearnings and ambitions which would make this temptation of Satan more than just perfunctory:

. . . yet this was not all
 To which my spirit aspir'd; victorious deeds
 Flam'd in my heart, heroic acts; one while
 To rescue Israel from the Roman yoke,
 Then to subdue and quell o'er all the earth
 Brute violence and proud Tyrannic pow'r,
 Till truth were freed, and equity restor'd:
 Yet held it more humane, more heavenly, first
 By winning words to conquer willing hearts,
 And make persuasion do the work of fear;
 At least to try, and teach the erring Soul
 Not wilfully misdoing, but unaware
 Misled: the stubborn only to subdue.

(I, 214-226)

This is precisely the power with which Satan tempts Christ with his challenge to be famous by wisdom. Significantly, the reasoning Satan uses for acquiring mastery of the pagan doctrines and learning is precisely the rationale used by some of the early doctors of the Church for converting their pagan brethren. Furthermore, the early ambitions of Christ correspond closely with Milton's own ambitions for his poetry, thus revealing Milton's personal susceptibility to the temptation which Satan elucidates in his attempt to entrap Christ with the promise of dominion over the earth.

Christ's denunciation of this temptation is devastating in its completeness and its vehemence:

Think not but that I know these things; or think

I know them not; not therefore am I short
 Of knowing what I ought: he who receives
 Light from above, from the fountain of light,
 No other doctrine needs, though granted true;
 But these are false, or little else but dreams,
 Conjectures, fancies, built on nothing firm.

(IV, 286-292)

Christ then goes on to categorically reject the learning of all of the principal pagan philosophers, including Plato, Socrates, Aristotle, Epicurus and Epictetus. He sums up his disdain for their learning with the following passage:

Much of the Soul they talk, but all awry,
 And in themselves seek virtue, and to themselves
 All glory arrogate, to God give none,
 Rather accuse him under usual names,
 Fortune and Fate, as one regardless quite
 Of mortal things. Who therefore seeks in these
 True wisdom, finds her not, or by delusion
 Far worse, her false resemblance only meets,
 An empty cloud. However, many books
 Wise men have said are wearisome; who reads
 Incessantly, and to his reading brings not
 A spirit and judgment equal or superior
 (And what he brings, what needs he elsewhere seek)
 Uncertain and unsettl'd still remains,
 Deep verst in books and shallow in himself,

(IV, 313-328)

At first glance, this attitude of Milton, expressed through the unimpeachable character of Christ, seems to be an irrevocable denunciation of learning. When considered, however, in the context of Milton's firm principles concerning the proper role of knowledge as expressed in Paradise Lost, this treatment of Satan's temptation based on knowledge fully supports Milton's hierarchy of values and the relationship of knowledge in that hierarchy. Christ rejects Satan's offering because it seeks to persuade Christ to arrogate to himself the prerogatives and powers of God alone. Knowledge, in and of itself is morally and religiously neutral; it is the use to which knowledge is put by Satan that Christ rejects. In fact, Christ subtly advocates the knowledge of pagan doctrines and philosophies as an aid to Christian faith even as he denounces the Philosophies themselves:

The first and wisest of them all profess'd
To know this only, that he nothing knew;
The next to fabling fell and smooth conceits;
A third sort doubted all things, though plain sense;
Others in virtue plac'd felicity,
But virtue join'd with riches and long life;
In corporal pleasure he, and careless ease;
The Stoic last in Philosophic pride,
By him call'd virtue; and his virtuous man,
Wise, perfect in himself, and all possessing
Equal to God, oft shames not to prefer,
As fearing God nor man, contemning all

Wealth, pleasure, pain or torment, death and life,
 Which when he lists, he leaves, or boasts he can,
 For all his tedious talk is but vain boast,
 Or subtle shifts conviction to evade.

(IV, 293-308)

Clearly, Christ could not reject these doctrines so profoundly unless he was intimately familiar with their surface precepts and their most profound ramifications. Therefore, knowledge of the pagan "truths" can actively aid the Christian in upholding his faith in the one, true Christian truth. Beyond this point, the above passage clearly elucidates the temptation inherent in learning itself - the temptation to replace God with the learned man. This is precisely the temptation presented to Eve in the Garden, a temptation to which she and Adam easily fell.

Satan's final temptation of Christ is desperate and foolhardy. He places Christ atop the pinnacle of the Temple and dares him to maintain himself steady upon his precarious mount. Jesus smoothly answers him:

. . . Also it is written,
 Tempt not the Lord thy God; he said and stood.
 But Satan smitten with amazement fell

(IV, 560-562)

Christ is then aided by an angelic host in leaving his high fastness and is returned to the Desert, where he is fed and refreshed by God's ministers. Having stood firm in the face of Satan's most powerful temptations, in the process regaining for man his lost Paradise, Christ

. . . unobserv'd

Home to his Mother's house private returned.

(IV, 638-639)

In Paradise Regained, Milton subtly but powerfully restates his principles regarding the proper role of learning and knowledge in the devout Christian. Presenting his audience with a Christ who, in all important respects, compares with no one so closely as with Adam in Eden before the Fall, Milton dramatically represents Christ's use of knowledge in rejecting Satan's temptation to become famous by his wisdom. In the end, Christ's subordination of knowledge to obedience to God's word and his rejection of the proud promises of pagan knowledge show him to be the truly "perfect Man." This perfection is based on Christ's recognition of the proper Christian hierarchy of values and learning's proper position in that hierarchy. These same beliefs, this same hierarchy of values can be found in Milton's earlier Paradise Lost. Thus, Paradise Regained represents a grand Miltonic reprise of one of the major themes in his epic poetry - the role of knowledge.

CONCLUSION

Milton's Place in the Seventeenth Century

After considering Milton's important prose treatise Of Education and his two major poetic works, Paradise Lost and Paradise Regained, some perspective can be gained as to his position in the history of scientific and humanist thought in seventeenth century England. As a starting point, we find Milton exquisitely sensitive to Nature and to an empiric and sensuous approach to Nature. As a poet, Milton is magnificently capable of displaying this sensitivity. As an intellectual, he can appreciate and commend some of the scientific discoveries of his age which are based upon this empiric approach.

Yet, Milton's integration of empiric science into his poetry and prose takes more subtle and profound routes than the integration of a simple superficial veneer of scientific imagery into his poetry. Milton shares fundamental viewpoints with the "new philosophers" of the age. His appreciation for and admiration of the infinitude of space, his dynamic vision of the cosmos and his ability to accept and even rejoice at the changes in the cosmos being discovered almost daily through the efforts of the "new philosophers" places Milton squarely in their midst. Furthermore, his belief in and dedication to the progress of man closely mirrors the "new philosophers'" belief in the progress promised man by the adherence to a Baconian investigation of Nature which will yield to man control over the earth which God gave man as his demesne.

Clearly, Milton's progress differs in substance from that of the empiric philosophers. He was interested in social progress, in creating a new

Jerusalem in England's green and pleasant land. Yet, his concern with producing effects and his realization that these effects could only be produced by men educated in the "things" surrounding them strongly echoes the concerns and the methods of the great propagandist of empiric science, Sir Francis Bacon.

Tempering this progressive vision and this reliance upon empiricism are Milton's fervent beliefs concerning the limits of man's knowledge and its proper relationship to Christian piety and obedience. Above all, man should concern himself with the intermediate kinds of knowledge whose fruits he can apply in the direction of his own life and that of the society he leads. If man seeks knowledge beyond these prudent and temperate bounds, the temptation presented by knowledge to man to attempt to replace or negate God in his conception of the world will become irresistible, resulting inevitably in man's disgrace and degradation. Knowledge must be subordinated to obedience to God's word, which each man must intelligently determine for himself by an active interest in and study of God's revealed Word.

In the end, Milton is willing to work hand in hand with the empirical "new philosophers" in creating man's future progress because he shares basic sympathies with them. Unlike Browne, for example, who views man and the cosmos as being linked by an ornate and intricate microcosm-macrocosm analogy, Milton integrates only the general principles of the new cosmography, such as dynamism and infinitude, into his vision of nature. Therefore, when changes in the fine structure of the universe are discovered, of which Milton tacitly approves through his acceptance of change as a divine principle of the universe, Milton's basic faith and psychological security are not challenged. He can easily incorporate these changes in cosmic detail into his intellectual

matrix because he already accepts at a fundamental level the organizing principles of the "new Philosophy."

Science and the Humanities Today

Milton's ability to deal rationally and reasonably with the "new philosophy" in seventeenth century England while still retaining his Christian faith and his humanistic values has a potentially important impact on the thinking man in today's world. Milton's century, which saw revolutionary changes in religious, political and scientific thought, compares closely with our own era, when continuous and rapid change threatens to overtake and overwhelm even the most involved and concerned members of our society. In particular, the growing separation of scientific and philosophic or humanistic studies which posed the single most important intellectual issue to Milton and his contemporaries, has in many respects resulted in an almost insurmountable "great gulf fix'd" between the two intellectual pursuits in our own era.

This realization is neither new nor profound. C. P. Snow dramatically illustrated this dichotomy when he talked about the "two cultures," though he has precious little to say about how to resolve the two communities' differences. Snow envisions, on one hand, the optimistic, progressively minded scientists who proclaim the twentieth century as a "new Elizabethan age," while literary intellectuals, for the most part, exude only gloom and despair. In many respects, modern society has seen how the promethean promises of science have, in part, resulted in a sour fulfillment. Modern concerns with the safety of nuclear power, the poisoning of our environment by the fruits of science and the morality of practices made possible by science such as abortion and genetic engineering reflect the incomplete fulfillment of what

may be considered scientific arrogance. For their part, leaders of humanistic studies have contributed little to the public debate as to the proper ordering of society's priorities which the pursuit of scientific knowledge makes imperative if we are to continue to live in a world of personal freedom and individual choice.

In an appropriately circular fashion, I come back to Bronowski in my consideration of these issues. In his book, Science and Human Values, he states that the essential values of science are also the values of the modern, Western democracies. In particular, he cites honesty, respect for the dignity of others, the right to disagree and to speak freely and the right of free association as the values which both society at large and the intellectual society of scientists have in common. In identifying these points of commonality, Bronowski seeks to engender the understanding and mutual respect between the scientific and the humanitarian intellectuals which Snow sees as lacking in today's world.

Yet, for all his erudition and wide-ranging interests, Bronowski is no Milton. Milton's ambitious goal to grab the attention of his countrymen and to lead them in reordering their national priorities on sound intellectual and religious principles seems beyond the grasp of today's intellectual leaders. Perhaps the heterogeneity of modern, democratic society makes this impossible; perhaps the inundation of the public media of discussion and debate with frivolous, single issue partisans would thwart even a modern day Milton. Yet Milton's example, his ability to integrate and synthesize these intellectual pursuits into a single, morally directed life, both for himself and for his countrymen, can only inspire us to seek a similar synthesis. His eventual failure, at least at a superficial level (for the Stuarts returned to rule England, though never in quite the same way), may deter us. But progress never

comes easy and it can never be completely realized in a single generation or even in a single culture. To progress, we clearly must take up again the challenge which Milton sought to answer.

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was new and challenging, often saw the foundations of its social, political and religious thought under attack, both overt and subtle, by empirical thinkers and scientists, known to the world as the "New Philosophers."

Midshipman Gorenflo studied these complex and seminal currents of thought through research into both primary and secondary sources. Using the writings of Michael de Montaigne, Sir Thomas Browne, Thomas Hobbes, Abraham Cowley and Sir Francis Bacon as a backdrop, Midshipman Gorenflo then focused his research on the figure of John Milton, a mandeeply involved in the political, religious and literary issues of his day.

In John Milton, Midshipman Gorenflo found a poet who was concerned with and sympathetic to the new scientific inquiries and methods. He incorporated empiric concerns with space and dynamics into his epic poetic works. Above all, Milton was dedicated to changing society as he found it into a new, righteous, christian commonwealth in which empiric science, guided by the precepts of his faith and concern for the dignity of man, would play an important, though not paramount role.

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