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DISSERTATION

A FOUR-ACT PLAY

PHILOSOPHY AND SCIENCE:

THE IMPACT ON MANAGEMENT THEORY AND PRACTICE

Submitted by

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School of Education

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Spring 2005

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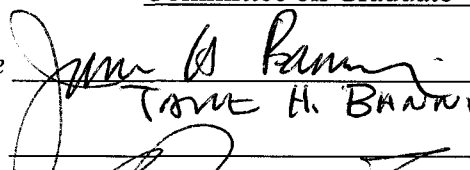
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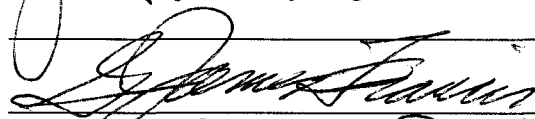
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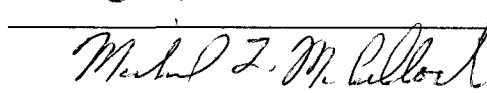
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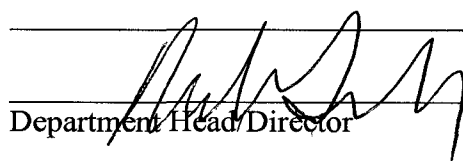

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ABSTRACT OF DISSERTATION

A FOUR-ACT PLAY: SCIENCE AND PHILOSOPHY

THE IMPACT ON MANAGEMENT THEORY AND PRACTICE

Science, philosophy, and management theory share common roots. The earliest philosophers were the scientists of their day, engaging their peers via discourse and written form. Metaphysics was not separate of science it *was* science; philosophers discussed human existence and the nature of *Being* based on reason and observation of the world around them. Plato, for example, theorized on both the meaning and the basis of life.

The question this document is concerned with is whether a study of the interaction between science, philosophy, and written communication can provide insight into the changes wrought in daily life, both in the community and within organizations. The answer to this will enable us to look at emerging science and philosophy today so that we can better understand the possible future we may be dealing with in organizational settings. The research question is: *What relationship and possible timeline can we discover between philosophy, science, and literature that can help us understand the forces that impact management theory within organizations?*

The method used for this study, although accepted within the field of qualitative research, is relatively new. This study will employ a qualitative research methodology referred to as philosophical hermeneutics and the research will be conveyed in the format of a performance text. Quite literally, the reader will engage with the topic via a four-act

play in which the narrator will guide the reader through history and into the present day, interacting with characters who have been affected by western philosophy, science, and literature, and who are part of life within various organizations.

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Chapter One

Prologue to the Play

Science, philosophy, and management theory share common roots. The earliest philosophers were the scientists of their day, engaging their peers via discourse and written form. Metaphysics was not separate of science it *was* science; philosophers discussed human existence and the nature of *Being* based on reason and observation of the world around them. Plato, for example, theorized on both the meaning and the basis of life (Scharfstein, 1998).

Through the Renaissance period men were schooled in both theology and science. The great scientists, Newton, Copernicus, Galileo, and their peers, pursued science as a means of understanding God, not as a means to argue His non-existence. It was not until after the Enlightenment period, based on the philosophic treatise of men like Rene Descarte that we separated theology, philosophy, and science. The question we might ask is whether, like with many things in life, we are about to come full circle? Will Western philosophy re-merge back to a whole with science? And more importantly, what impact has the interplay between science, philosophy, and written communication had on daily life?

Science, philosophy, and written communication have affected one another throughout history. Scientific discoveries challenge philosophy, and philosophy typically frames scientific research questions. The sharing of philosophic thought promulgates a new set of paradigms for scientific discovery. Scientific discovery stirs philosophic

debate that poses new questions and in turn, challenges scientific knowledge. The marriage of science and philosophy has at times been weak, but the two have never been fully divorced. Today there is a literature base referred to as the philosophy of science. There are also scientists who believe in the irrefutable existence of a 'grand designer'. Academic literature, the resultant child of science and philosophy, has provided the window into the marriage. Until recently, literature has been controlled by reigning political forces, but with the advent of newer and cheaper forms of written communication, the bubble of control has burst and the common person is now able to play within the scientific and philosophic fields.

Previous to the printing press, scientific discovery and the work of philosophers made little impact on the day to day life of the common person. People, especially in an agrarian economy, carried on their day-to-day lives with little concern for scientific theory and discovery, and were not engaged in the heady debates within philosophic circles. The advent of the printing press changed the world. For the first time, everyday life was affected by what people learned outside of their own personal experiences. An increase in literacy during the Enlightenment period resulted in the availability of philosophic thought and scientific discovery to the commoner (Haugeland, 2000; Ladyman, 2002).

In Search of a New View

The question this document is concerned with is whether a study of the interaction between science, philosophy, and written communication can provide insight into the changes wrought in daily life, both in the community and within organizations. The answer to this will enable us to look at emerging science and philosophy today so that we

can better understand the possible future we may be dealing with in organizational settings. The research question is: *What relationship and possible timeline can we discover between philosophy, science, and written communication that can help us understand the forces that impact management theory within organizations?*

Method

Qualitative inquiry is particularly well suited to exploring the relationship between science, western philosophy, and written communication. The goal of a qualitative approach is to situate the reader into the world being examined and to “attempt to make sense of, or to interpret, phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 2000, p. 3). The reader of qualitative research is engaged with the subject(s) in such a way that he or she is able to grasp the meanings that resulted in actions taken.

The method used for this study, although accepted within the field of qualitative research, is relatively new. This study will employ a qualitative research methodology referred to as philosophical hermeneutics and the research will be conveyed in the format of a performance text. Quite literally, the reader will engage with the topic via a four-act play in which the narrator will guide the reader through history and into the present day, interacting with characters who have been affected by western philosophy, science, and written communication, and who are from different walks of life.

Performance text does not adopt an interpretivist point of view. The goal is for the reader and researcher to remain objective and outside of the context, but to create a text where both are engaged in the dialogue and where “Understanding *is* interpretation” (Schwandt, 2000, p. 194). Context and history are recreated in a performance text.

Philosophers Dilthey and Gadamer argue that an individual cannot be understood independent of his or her historical life (Polet, 1994); the same applies to understanding philosophy, science, and organizational practice – they cannot be understood independent of their history and context.

Philosophical Hermeneutics

Theologian Friedrich Schleiermacher (1768-1834) developed the modern discipline of hermeneutics in early the 1800s as a science for interpreting sacred texts. Schleiermacher realized that laws and sacred texts written in earlier times could not be understood without a clear understanding of the cultural context and language norms employed during the time within which they were written. Hermeneutics provides an objective methodology to examine written text and to ascribe meaning as it was intended at the time the text was written (Denzin & Lincoln, 2000; Phillips & Burbules, 2000; Polkinghorne, 1988).

Philosophical hermeneutics arose in the late 19th and early 20th centuries in reaction to the then-dominant philosophy of positivism and “argues that understanding is not, in the first instance, a procedure or rule-governed undertaking; rather, it is a very condition of being human” (Schwandt, 2000, p. 194). According to Hans-Greorg Gadamer (1900-2002), the founder of philosophical hermeneutics, the act of interpreting is embedded with sociohistorically inherited bias, and that it is not something from which we can free and distance ourselves. Therefore, if we cannot set aside our prejudices and prejudgments, then understanding requires that we engage them. Engaging our prejudices in exploring that which is alien to our experience is the means by which we open ourselves to risking and testing our preconceptions and prejudices (Schwandt, 2000).

Gadamer argued that personal history was an indispensable feature of our *Being-in-the-world* and that rather than trying to escape it, we should acknowledge it, setting the stage for a fruitful dialogue with the historical past.

Critical hermeneutic tradition, which is the basis for interpretation in critical theory research, is based on the premise that there is *only* interpretation and that facts do not speak for themselves. According to critical theory researchers, “the hermeneutic act of interpretation involves in its most elemental articulation making sense of what has been observed in a way that communicates understanding...perception itself is an act of interpretation” (Kincheloe & McLaren, 2000, p. 285).

Postmodern thought during the twentieth century brought the objective stance of scientific explanation into question. According to postmodern philosophy, language – and particularly written text – separated from the cultural setting in which they are created are poor representations of meaning (Eco, 1976). Understanding is something that is produced in dialogue, not something reproduced by an objective reporter (Schwandt, 2000). Within the hermeneutic tradition, researchers are encouraged to “transcend the inadequacies of thin descriptions of decontextualized facts and produce thick descriptions of social texts characterized by the contexts of their production, the intentions of their producers, and the meanings mobilized in the processes of their construction”(Kincheloe & McLaren, 2000, p. 286). It is the philosophy that dialogue cannot be adequately interpreted through analysis that supports the use of performance texts to present qualitative research.

Performance Text

Qualitative researchers use philosophical or critical hermeneutics to set the stage for knowledge production. The goal of the researcher is to “build bridges between the reader and the text, between the text and its producer, historical context and present, and one particular social circumstance and another” (Kincheloe & McLaren, 2000, p. 286). Denizen (2000), states that the social sciences have taken the narrative turn and that there is now support for a set of writing practices that turn notes from the field into texts that are designed to be performed. He bases his position on the fact that we now “inhabit a performance-based, dramaturgical culture... [where] culture itself becomes a dramatic performance” (p. 903). This shift has resulted in a culture that understands meaning through story format; there is an interdisciplinary movement toward the use of texts that move beyond representation to presentation. Performance texts are typically presented in the form of a script – a dialogue between the narrator and the interviewees. This presentation is also referred to in scholarly journals as reader’s theater. If read aloud, the stage is set in simplistic style, without props or stage lighting. The goal is not to copy conventional, realistic forms of drama, but to use a presentation format, where participants read from the script in order to encourage audience imagination; the audience becomes an active participant in the making of meaning (Conquergood, 1992; Conquergood, 2002; Donmoyer & Yennie-Donmoyer, 1998; Goffman, 1957).

In their use of reader’s theater, researcher Donmoyer and Yennie-Donmoyer (1998) discovered that the montage-like format of reader’s theater provided an appropriate vehicle for capturing complexity without obscuring it or forcing it into a preset scientific model of interpretation. Performed texts are “storied retellings that seek

the truth of life's fictions via evocation rather than explanation of analysis" (Denzin, 2000, p. 905).

It is through the use of a four-act play, written in the format of the reader's theater, that this study will seek to discover the relationship and, within historical context, the interplay between western philosophy, science, written communication, and management theory. Brady (2001) points out that every culture has a notion of its history and heritage, why it exists in its current form and that this notion is open to influence based on outside inquiry. The challenge, as Brady reminds us, is to do justice to both the individual parts and the whole during the process of determining which parts of history to represent.

Structure of the Research

The research will be presented in the format of a four-act play. The play will be presented in chapter two. Chapter three is formatted in the form of a critique of the play, to assess the interpretation of the performance from my own perspective as the researcher and to make recommendations for future research.

Chapter two is laid out similar to the script for a four-act play. Background information is provided prior to each scene in order to provide context for the dialogue. Each Act contains several scenes; each set in a different time period. Act One introduces the reader to historical figures from ancient history up till the Renaissance Period. The Second Act takes the reader on a journey through time from the Renaissance Period up through the pre-industrial period. The Third Act covers the Industrial Revolution up to the twentieth century. The Fourth Act is an exploration of events from the year 1900 into

the present, with a prescient look into cutting edge scientific discovery and the possible implications on philosophic discourse and management theory.

The question the narrator asks throughout the play is what impact did the interplay between science, philosophy, and written communication have on daily life? Seeking the answer to this question is the quest of the narrator/protagonist in the play. The common pursuit of the answer to this question will help both the actors and audience develop an understanding of how philosophy and science impact one another. The expectation is that the reader will develop a better understanding of humanity as a compilation of unique, complex individuals in a society that is impacted by a multitude of forces and ways of knowing. And that through this new insight, the reader will come to understand his or her own prejudices and prejudgments and be better prepared to engage and challenge personal perspectives as he or she encounters the world.

Chapter Two

A Four-Act Play

Philosophy and Science in Management History

Introduction

The study of management history is relatively new. Typically, studies in management history tend to focus on the impact of economic, social, political, and technological factors. There is, however, scant attention paid to the impact of science and philosophy on the evolution of management theory and practice (Bedeian, 2004).

The underpinning proposition of the discussion to follow is that philosophy, science, and management practices are intertwined. Philosophic perspectives frame the research questions explored by scientists. Scientific discoveries test, and therefore support or challenge, philosophic perspectives. In practice, both science and philosophy are mirrored in organizational life and management theory and practice (Kuhn, 1970; Ziman, 1998).

Setting the Context

Researchers have studied management theory and practice over the last two centuries. Business and management histories are at once very old and very young. As a subject, the professional manager role did not exist prior to the Industrial Revolution. With the advent of factories large numbers of employees were hired, requiring systems of control to manage employee productivity. However, it can be argued that management theory and practice can be traced as far back as 4000 BC when people began to gather in cities to live and work (Gras, 1938; Matthew, 2003; Nixon, 2003).

Despite the rigor of research and articulation of theory related to best practices, the brevity of the field of professional management has produced a short horizon view of the complexity of management theory and practice. In less than one hundred years management theory has vacillated between the extremes of hierarchical control, scientific management, self-directed teams, and human relations theory (Pindurs, Rogers, & Kim, 1995). The purpose of this treatise is to present a long-range view of management history as it relates to scientific discoveries and philosophic debate.

The Four-Act Play

Introduction

Characters in the Play

MINERVA, the storyteller; an historian. A woman of intellect and wisdom.

ADAM, a college student.

GEORGE, an entrepreneur; husband to Ellen.

ELLEN, a manager in a large company; mother of two children; wife to George.

JAKE, an engineer; friend to George and Ellen.

MARY ANN, a salesperson; friend to Toni.

TONI, a high school teacher; friend to Mary Ann.

JUSTIN, a carpenter; husband to Linda.

LINDA, an accountant; wife to Justin.

BILL, a retired military chaplain.

IRENE, wife to retired military chaplain Bill; housewife who raised three children.

ABBY, owner of the lodge; wife to David.

DAVID, owner of the lodge; husband to Abby.

The entire play is set inside a ski lodge in western Montana. A group of weekend visitors are staying at the lodge for a cross-country skiing weekend. A winter storm has moved in; the blizzard conditions have forced the vacationers to stay indoors. In the opening scene we find Minerva, Adam, and Abby sitting in the Great Room, sipping tea by a crackling fireplace.

ACT ONE

The First Epoch: Pre-Renaissance

Scene 1

Enter Bill and Irene

MINERVA: Good morning. Care to join us for a cup of tea?

BILL: Thanks, we'd love to. *(Bill and Irene sit down on the couch)*

ABBY: I can't change the weather outside, but I can at least make it inviting inside.

ADAM: We were just discussing the wonders of modern technology. While the storm is raging outside, we're all sitting here nice and cozy with electric lights and satellite news. Looks like this storm is going to last most of the week.

IRENE: I had better e-mail the kids, let them know we won't be home as soon as expected.

ABBY: You can use our computer in the library.

MINERVA: Beats the days of scrolls and carrier pigeons!

ADAM: Hey, Minerva, I heard that you are some kind of historian or something – that right?

MINERVA: You might say that. I have been fascinated with and studied the history of science and philosophy for many years.

BILL: Interesting combination Minerva.

ADAM: (*scoffing*) Yeah, sounds REAL interesting.

MINERVA: You sound skeptical Adam.

ADAM: Yeah, well I get bored by history. I'm majoring in business – that's where the action is.

BILL: Have you ever studied the history of business?

ADAM: (*shrugs*) A little. My professor made us read about management history – it all started with Frederick Taylor – some guy who claimed to create scientific management or something like that. I figured it was just some great turn-of-the-century consultant scheme. Most of that stuff is pretty dry. I don't see why it's important anyway – at the rate things are changing you gotta implement something new every couple of years anyway.

IRENE: You sound like my daughter – a little cynical, aren't you?

ADAM: Nah, just realistic.

MINERVA: Adam, do you even know what you mean by realistic?

ADAM: What do you mean?

MINERVA: Philosophers and scientists have debated the nature of reality for centuries.

In fact, the debate about the nature of reality probably started before we have written record of it and it affects how you work in business today.

ADAM: I don't think I buy that.

BILL: It's true. Even the history of religion affects your actions in business today.

MINERVA: You're right Bill, but did you know the first written language wasn't about religion or reality – it was about business.

BILL: I think I read that somewhere. (*Looking at Adam*) Did you know that business was one of the primary reasons we developed socially? But it is really religion that brought about the early advances in knowledge.

ADAM: How so?

BILL: Well, as I understand history, it was the search for how God set up the universe that created the first areas of scientific study.

ADAM: (*sounding skeptical*) Soooo....you think religion and science worked together?

BILL: Absolutely. The first great scientists were all philosophers or theologians.

ADAM: Nah, I ain't buying that.

MINERVA: Actually, Adam, Bill is right. Let me share a story...

Sacred texts and archeological evidence, including inscriptions on small pieces of stone and metal, confirm the existence of a commercially and philosophically advanced civilization as far back as 4000 BC. Trade in Egypt and along the rivers in Babylonia flourished. As civilization developed in ancient times, people began to collect into towns. The first alphabet was developed in approximately 3200 BC in Sumeria as a means for merchants and town officials to account for goods and services. In about 3200 BC scribes began to record information on clay tablets. Symbols were developed to represent males, females, and a variety of animals, goods, landmarks, etc. Over time the symbols became more sophisticated; symbols were developed to represent sounds rather than objects. As Sumerian writing became more sophisticated it was used for more than inventory and

record keeping. Wealthy merchants and authorities had scribes write down stories about their victories and accomplishments. Writing was used to convey social norms. Scholar-scribes recorded ancient myths that had been handed down orally for generations.

Some towns grew into small cities, housing as many as 35,000 people. Most of the cities were dependent on the rivers and were located close together; Ur, for example, was visible from Eridu. As time went on, larger cities conquered smaller cities thereby creating city-states. Larger cities and warfare created the need for rules and the emergence of warrior-kings. A hierarchy of wealth and power existed within their social order. Slave labor, trade, commerce, and government all required 'managers' to maintain order and structure. Managers were surely in place for the building of the Great Wall of Uruk (with 900 towers), the pyramids of Egypt, and the Great Sphinx of Gizeh (Davis, 2004; Farah & Karls, 1997; Grun, 1991).

By 3500 BC Egyptians held a strong belief in life after death. And by 2750 BC the systematic observation of astronomy was in place in Egypt, Babylonia, India, and China. Libraries existed in every important Babylonian city, with thousands of books, dictionaries, grammars, reference works, encyclopedias, official annals, works on mathematics, astronomy, geography, religion, and politics. Advanced mathematics existed, as is evidenced by the construction of the pyramids. In approximately 2000 BC Hammurabi had his scribes collect and codify the laws of his kingdom, which were engraved on stones and set up in all the principal cities. The laws, which contained 282 sections dealing with most aspects of daily life, defined actions that were considered violations as well as the mandated punishment. The laws were harsh and meted out punishment to perpetrators according to the social ranking of the victim. The code of

Hammurabi makes it apparent that government had taken on the role of protecting its citizenry in exchange for their loyalty and service (Farah & Karls, 1997; Halley, 1965).

Cities in Babylonia, Egypt, India, China, and the Middle East all appear to have developed sophisticated governments and cultures along the same timeline. These other civilizations may have developed a system of writing as a result of trade contact with Sumerians. Recent archeological findings in Egypt indicate that Egyptians may have developed a system of writing independent of Sumerian influence (and possibly before the Sumerians). Archeologists have found a victory monument to a warrior named Scorpion who united Egypt in approximately 3000 BC. Scorpion may also be Menes, whose name appears on ancient lists of Egyptian rulers.

Egypt's unifying vision over the next three thousand years was the pharaoh. Egyptians believed the pharaoh was a living god. In Egyptian hieroglyphs, the pharaohs are always depicted as strong and calm; they were the source of Egyptian power, social order, and justice system. The early pharaohs built the pyramids, which likely served several purposes. The pyramids were visible along the Nile, serving as reminders of the power of the pharaohs. The building of the pyramids also unified the people around a common goal and provided early employment during the flood season. Each year when the Nile flooded, the pharaoh's builders hired thousands of peasant-workers to cut stone from quarries hundreds of miles away, transport them on rafts to the building site, and then drag them up long earthen ramps where they placed the stones. The building of the pyramids provided government income for peasant-workers for a quarter of the year. Working together with peasants from other places provided the Egyptian people with a sense of unity.

The building of the pyramids also unified the ruling class, bonding them to the pharaoh. The wealthy members of society had their tombs located near the great pyramid tombs of their rulers. With their bodies mummified like his, they believed they would join him in an afterlife. The pharaoh represented the unification of all people around a common religion.

In about 2100 BC, after a thousand years of unity in Egypt, rival factions began to fight for power, throwing the country into turmoil for over 150 years. Southern rulers finally prevailed, moving the Egyptian capital from Memphis to Thebes. Order was re-established for the next two centuries. Throughout this two hundred-year period the pictures of the pharaohs on their tombs looked very different from earlier or later hieroglyphs. The pharaohs were portrayed as shepherds of their flocks. Statues represented them as old and worn. The pharaohs appear to have been less distant from their people and more concerned about the ordinary man.

The rule of the southern pharaohs ended with the invasion of an Asiatic people, riding horse-drawn chariots of war and carrying battle-axes. The Egyptians called them 'Hyksos', possibly meaning 'rulers of foreign lands'. The Egyptians adopted the Hyksos way of waging war and defeated them a century later.

Over the next five hundred years the pharaohs turned their armies toward conquest of other lands, expanding their country and creating an empire. At times they ruled the small countries along the eastern shore of the Mediterranean, Palestine, and Syria. They also drove south along the Nile and conquered the land of Kush.

In approximately 1350 BC, Pharaoh Amenhotep IV broke from Egyptian beliefs that were held for over two thousand years, proclaiming Aten, a sun-god, to be the only

god. He ordered his people to abandon all the old gods. He described Aten as a loving world creator, responsible for the creation of human life. Amenhotep changed his name, which indicated reverence of the god Amen, to Akhenaten ('One Useful to Aten'). In his zeal to convert Egypt he neglected his administrative duties. Enemies attacked and Egypt lost a significant part of its empire. Akhenaten recanted his beliefs and started to restore the old Egyptian gods. After his death he was succeeded by a series of men who were married to his daughters, all of who failed to restore Egypt to its former glory. Later pharaohs considered Akhenaten and his first three successors as tainted by the same offenses to the gods. Their names were struck from the official lists of pharaohs.

Egypt continued as a great power in the ancient world until about 1100 BC, after which it was conquered and absorbed by other great empires. These empires absorbed Egyptian lore and learning. Egypt stands out as remarkable for its ability to maintain a consistent social and philosophical system for thousands of years (Davis, 2004).

The Birth of Judaism

Biblical chronology from Genesis 5, dates the creation of man (Adam) in about 4000 BC. The Genesis flood is dated in 2348 BC. Abram was born in 1996 BC. Abram, a Sumerian who lived in Ur, was the founder of Judaism. Commanded by God, Abram gathered his family, friends, slaves, and flocks, left Ur, and traveled west, then south into the land of Canaan. This small group of Hebrews settled down amongst the Canaanite civilization, traveling with their flocks among the pasturelands.

When Abram was ninety years old, and his wife Sarah was eighty, they had a son named Isaac. God made a covenant with Abram to give him the land of Canaan; in return Abram and his descendants would be bound to one God. The covenant was sealed and

symbolized through the circumcision of all male children. Abram changed his name to Abraham, then had himself, his tribesmen, and all his slaves circumcised. The Hebrews became the first monotheistic religion, and the first to reject human sacrifice to the gods.

After Abraham died, Isaac became the leader of the Hebrews. A generation later, Jacob, a son of Isaac, took his father's place. The Old Testament tells the story of Jacob's encounter with an angel of God, in which Jacob and the angel wrestled through the night. In the morning the angel blessed Jacob and changed his name to Israel ('God rules'), because he had "striven with God and with men and...prevailed" Genesis 31:28 (New American Standard).

Within a few hundred years the Hebrews living in Canaan became known as Jews, believers in Yahweh or Jehovah. Eventually the concept of the Jewish God took on a universal character. Although there are periods throughout ancient history when the Jews turned to worship of other deities, Yahweh was the only God worshipped by the Jews by the time of Jesus.

In about 1600 BC, a group of Hebrews moved from Canaan to Egypt to escape a period of famine. When they arrived, they found Joseph, the youngest son of Jacob (Israel), serving as a high official under the pharaoh. The story goes, that years earlier Joseph, who was envied by his brothers because of the love Jacob held for Joseph, was sold by his brothers into slavery when he was a young boy. His brothers reported to their father that Joseph was murdered. Carried into Egypt as a slave, Joseph quickly rose in prestige because of his ability to interpret dreams. Unfortunately, Joseph, who was handsome, ran afoul of the wife of his master and was thrown into prison on false charges. While in prison, Joseph began to interpret dreams; the pharaoh, who heard of

Joseph's abilities, brought him into his court as an advisor. Joseph quickly found favor with the pharaoh and was promoted. Joseph married a daughter of the priest of On, and though he had a pagan wife, he maintained his childhood faith in the Hebrew God.

At the time that Joseph's family and other Hebrews arrived in Egypt (which coincided with the invasion of the Hyksos), Joseph was able to bestow them protection under the pharaoh. Following Joseph's death, the Hebrew population continued to grow in Egypt. The pharaohs, in their cleansing of foreign powers in Egypt, enslaved the Hebrew population. There is a gap between Genesis and Exodus of close to 300 years (from the death of Joseph to the birth of Moses). At the time of the Exodus there were approximately three million Jews in Egypt.

The Old Testament teaches that Moses, a Hebrew child adopted by the daughter of the pharaoh, grew up in the house of the pharaoh. The pharaoh's daughter who adopted Moses is generally thought to have been the famous Queen Hatsheput, who was half-sister to Thotmes III (1500 BC), and who served as regent for the first twenty years of Thotmes reign. Although Thotmes despised her, she completely dominated him. This would have made it possible for Moses to become heir to the throne had he rejected Judaism in favor of Egyptian beliefs.

Unwittingly, the pharaoh's daughter hired a wet nurse to help in raising the child, who was none other than Jochebed, Moses' own mother. Jochebed taught Moses the traditions of the Hebrew people, and imbued in him a faith in Yahweh. As he grew to manhood Moses was offered the finest education in Egypt, but he still clung to the simple faith taught to him by Jochebed. Destined to become a ruler in Egypt, Moses was repulsed by the cruelty of the Egyptians toward the Hebrew slaves.

One day Moses witnessed an Egyptian overseer beating a Hebrew slave. Moses killed the man and hid his body in the sand. The murder became known and the pharaoh attempted to have Moses killed. Upon hearing the news, Moses fled into the desert where he met and married the daughter of a Hebrew shepherd. Moses lived the life of a wandering shepherd for the next forty years.

After the death of the pharaoh, Moses, under the command of God, returned to Egypt to demand the release of the Hebrew slaves. Moses was now eighty years old. He was a devout follower of God. The book of Exodus recounts the story of the plagues that Moses called down from God and laid upon the Egyptians in his struggle to convince the new pharaoh to release the Hebrew slaves. The pharaoh finally capitulated and Moses led three million Jews, along with their animals and possessions, out of Egypt.

Despite their deliverance by Moses under the power of God, the Hebrews quickly turned from God and offered sacrifices to the Egyptian gods. The book of Exodus records God's punishment on the people, who were destined to wander the desert for the next forty years until the entire generation of offenders died. It was the second generation of Jews who entered and conquered the land of Canaan. It was during the forty years of wandering that Moses recorded the first five books of the Old Testament (the Septuagint), wrote up a code of laws, transcribed the ten commandments passed down to him from God, and developed the priesthood. These laws and traditions form the basis of the Jewish religion (Davis, 2004; Halley, 1965; Van Doren, 1991).

According to Jewish belief, the Jews are the chosen people of God. They were given the ten commandments, the laws of Moses, the holy books of God, were promised by God that their time on earth would never end, and were required by God to be a

witness to His power and glory. The history of the Jews is long and complicated. They have indeed been a distinct group of people since the time of Abraham. They have survived persecution and attempts of genocide by many rulers and people throughout history. Judaism is the root of Christianity and Islam – the three great religions that shaped the development of western civilization (Van Doren, 1991).

Ancient Greek Society

Greek history is rooted in the culture that developed in and around the Aegean Sea during the Bronze Age. Based on archeological discovery it is generally accepted that Minoan culture on Crete, and Mycenaean culture on mainland Greece, formed the focal point for the first European civilization. Palace sites on Crete and at Mycenae have provided evidence of sophisticated art, religion, technology, and social structure that began c.1900 BC on Crete and approximately four centuries later for the more warlike Mycenaeans in Greece (Davies, 1996).

Crete, possessing the first sea-borne empire, flourished. Supported by the trade of their far-ranging ships they developed a sophisticated and well-ordered society. Running water and a flushed sewer system were available within households. Art adorned the walls and their domestic affairs were documented on clay tablets. While the Cretans (also known as Minoans) basked in the glory of the Bronze Age, their northern, landlocked European neighbors were still emerging from the Neolithic Age.

Archeological discoveries indicate that Minoan women enjoyed a higher status in society than women in other early civilizations. Minoan religion was based on the worship of more goddesses than gods; the primary deity was the Great Goddess, or Mother Earth, who was responsible for the growth of all living things. Murals depict both

men and women ornately adorned and engaged in activities such as dancing and sporting events (Farah & Karls, 1997).

The Mycenaeans, who traded with Minoan traders for many years, gradually adopted many of the elements of Minoan culture, including metalworking and shipbuilding techniques. The Mycenaeans also adopted the worship of the Minoan Earth Mother. Mimicking the Minoans, the Mycenaeans developed a social system that was centered in the city of Mycenae, which served as the center of government administration and production.

The decline of Cretan power came on the heels of catastrophe. The eruption of Thera (Santorini) in 1628 BC wreaked havoc on the Cretan empire. Earthquakes, tidal waves, and ashes from the volcanic eruption devastated the surrounding region. Temperatures plummeted throughout the northern hemisphere as volcanic dust veiled the area. Material destruction and population loss weakened Crete and left it open to invasion. The Mycenaeans conquered the Minoans by the mid 1400s BC (Farah & Karls, 1997).

In approximately 1200 BC Europe suffered an unexplained breakdown. Trade was disrupted; cities and political systems were abandoned. Within the space of a single century many established centers of civilization ceased to exist; the Aegean was invaded by tribes from the interior, including the Greek-speaking Dorians, and Greece was plunged into the Dark Ages, during which we have only meager historical and archeological record. During this period of time overseas trading ceased and the population lost skills such as writing and crafts. Thousands of refugees fled the mainland and settled in Ionia on the west coast of Asia Minor (Farah & Karls, 1997).

The historical record reappears with the first Olympiad (776 BC), which marks the beginning of the Golden Age of the Greek city-states, and lasted until the Greeks were forced to surrender and subject themselves to first Macedonian (338 BC) and then Roman rule. The Ionians reintroduced culture, crafts, and skills to Greece. The Dark Ages of the Dorians ended and a new Greek civilization, imbued with Mycenaean elements, emerged. The new civilization, referred to as Hellenic, flourished from the late 700s BC until their surrender to Macedonia in 338 BC.

The Macedonians, like the Spartans, were descendants of the Dorians. King Philip II of Macedonia was a hostage for three years in the Greek city-state of Thebes. During his period of captivity he came to admire Greek culture and military organization. When he became king in 359 BC he determined to do three things – create a strong army, unite the quarreling Greek city-states under Macedonian rule, and destroy the Persian Empire. By 338 BC Philip conquered all of Greece except for Sparta and announced that he would lead the Greeks and Macedonians in a war against Persia. In 336 BC Philip was murdered and the throne was passed on to his twenty-year-old son, Alexander. Having served as a military commander since age 16, and having been tutored for four years by Aristotle, Alexander proved to be a capable and effective leader.

In 334 BC Alexander led the first major encounter with the Persians. By 331 BC Alexander conquered Persia, including Persian-controlled Egypt. In Egypt, the people, discontent with Persian rule, welcomed Alexander and declared him a pharaoh. Greek cities were established in Egypt and into the depths of Asia (Davies, 1996; Farah & Karls, 1997; Halley, 1965).

Alexander fell ill with fever and died in 323 BC at the age of 33. The political unity of his empire crumbled with his death, but the Greek language and culture continued to spread and flourish. The blend of Greek religion, philosophy, and culture with Middle Eastern culture created a new culture, referred to as Hellenistic.

The Greeks were a slave-owning society and assumed that the bodies of the slaves were available for the use of the free; as a result, sexual activity became a function of social status. Despite legal constraints, men of superior status took advantage of their position and imposed their will on all inferiors. The Greeks followed a system of values that permitted open sexuality (including homosexuality and pedophilia), the subjugation of women, slavery, and infanticide (Blundell, 2000; Davies, 1996; Rouse, 1999).

The women of Athens were excluded from public and political life; they could not own property, make contracts, participate in court proceedings, or enter into a marriage on their own. Respectable females were excluded from all public locations, including the marketplace – either husbands or slave girls did the shopping. The only women in attendance at male parties were either mistresses or female entertainers. The segregation of men and women extended into the home when social life intervened. Women in the household were not present when guests were entertained and were not expected to have any interaction with male visitors. The exception to Greek segregation of women was in the lower class, where interaction was acceptable if the women were reserved in their conduct with men.

The relationship between males and females took on a different tone inside the home. It appears, based on male authorship, that women were the managers of the household. Although women were not allowed to conduct money transactions, they were

in charge of domestic finances. Women managed the household property, including the slaves (Blundell, 2000).

Greek social structure was complex. Life in city-states differed from rural life. In Athens there were three distinct social groups – slaves, metics (resident foreigners), and citizens. Slaves were considered chattel and could be killed with impunity. Freed slaves were automatically elevated in status to metics, who were not allowed to serve in the army, but were taxed and conscripted. Citizens had the right to own property and a duty to serve in the military. The citizens were divided into ten tribes, and then into smaller parishes. Each city-state governed itself, and the types of political systems were varied. Some city-states were democracies (such as Athens), others were oligarchies (such as Corinth or Sparta), monarchies (like Samos), and despotic (especially in the cities of Asia Minor). Plato's *Republic* and *Politics* offer discussion on two distinctly different types of government (Davies, 1996).

The era of Hellenism, which emerged after Alexander merged the Greek and non-Greek world, was a period of decadence. Hellenistic culture was a composite that incorporated Greek, Oriental, and Egyptian perspectives. Following the death of Alexander, the Greek world was divided between his four generals: Greece and Macedonia to Antigonus; Asia Minor to Attalid; Mesopotamia and the Middle East, including Syria, to Seleucus; and Egypt to Ptolemy; Palestine was claimed first by Syria and later went to Egypt (Halley, 1965).

Alexander's half-brother, Ptolemaeus Soter, established the Ptolemaic dynasty in Egypt. The city of Alexandria in Egypt rose in prominence and equaled Athens in Greece. Under the rule of the Ptolemies, Alexandria became the largest and most cultured

city in the East. The *Museum* (library) in Alexandria contained over 700,000 volumes and was dedicated to the preservation and study of Greek culture. It was in Alexandria that Jewish scholars worked to reconcile Jewish theology with Greek philosophy. Greek rule over Egypt continued until 30 BC when Cleopatra, daughter of Ptolemy XII and the last Queen of Egypt, took her own life through the bite of an asp. Cleopatra, as the lover of both Ceasar and Antony, had done her best to stop the advance of the Romans. The fall of Egypt to Rome marked the end of the Greek world and the emergence of the Graeco-Roman civilization (Davies, 1996).

Greek Philosophy and Science

Thales of Miletus (636-546 BC) became the first well-known Greek Philosopher. Thales proposed that everything derived from water. He measured the flood levels of the Nile and is credited with predicting solar eclipses. Anaximander, a student of Thales, is considered the founder of astronomy. It was Pythagoras (c. 580-500 BC) who is credited with connecting philosophy with practical life and who named it 'the love of wisdom'. Born in Samos, Pythagoras settled in Kroton in the south of Italy. He traveled and studied in Egypt and Babylonia, bringing his knowledge back to the west. Pythagoras regarded the world as a place where perfect harmony could be attained through mathematics. He created mathematical ways of representing and analyzing musical harmony. He developed theories explaining the mechanics of sight. He described light as an emission of particles travelling in straight lines between the eye and the object seen. He is credited with suggesting that the Earth is round, using the evidence that the Pole Star appears higher in the sky as one moves north, and that the earth's shadow is always circular during a lunar eclipse (Popkin and Stroll, 1993; Tallack, 2001).

Heraclitus of Ephesus (c. 500 AD) considered fire to be the primary form of matter. Empedocles of Acragas (c. 493-433 BC) held that the earth is made of four elements – fire, earth, air, and water, and that the constant merging and separating of these is the result of the stresses of love and strife. Democritus of Abdera (c.460-361 BC) added to the developing atomic theory, claiming that all physical matter could be explained in terms of random collisions of tiny particles, which he called *atoma*. Hippocrates (c.460-357 BC) moved medicine outside the mystique of religion and magic and developed a number of treatises on public health, hygiene, patient care, and surgery (Davies, 1996; Popkin and Stroll, 1993).

Greek religion was a mixture of myths, cults, and oracles. Greek philosophy developed in opposition to conventional religious attitudes. In 399 BC Socrates (469-399 BC) challenged the men of political power, and thereby attracted a flock of young followers. He was sentenced to death for introducing strange gods and corrupting the youth of Athens, which is interesting in light of the open minded, uninhibited society of Greece.

The early Greek philosophers thought of philosophy as we now think of science. They believed that philosophic reflection would reveal the nature of the world. The Greeks revolutionized learning through a system of organized knowledge. Thales and subsequent philosophers developed schools and shared knowledge with anyone who could read. Knowledge was no longer the property of an elite ruling class (Popkin & Stroll, 1993).

The Greeks were revolutionary in their thinking. Plato (428-348 BC), a devoted student of Socrates, argued that *Reason* is the virtue required to govern; he also argued

that a woman with a refined sense of *Reason* was as viable a candidate for the governing class as a man (in effect, Plato set the foundation for later feminist theory). Plato also established the Academy, the first university. Plato taught that truth and reason are external, that our lives must be governed using reason, and that humans can reason to external truth.

Plato asserted that feelings are the enemy of reason and that true citizens should banish emotions from their daily decisions. With this argument, Plato appears to be the first to have divided the mind into three distinct parts, or functions – reason, desire, and passion. He regarded reason as the highest of the three functions, and as the agent countermanding destructive animal passions. Plato also claimed that the truth of the world is not revealed through ordinary sense perception, but through reason alone, and that through reason one could come to understand self, God, and the world. Plato separated the body and soul. The body was the instrument that housed the soul and from which it was separated at death. Plato located emotions within the soul and saw the constant battle between emotion and reason as being fought within the human soul. He believed that certain types of music and drama were dangerous and corrupting because they appealed to the emotions, such that reason lost control of emotion and desire, and upset the balance between the three parts of the soul (Lazarus, 1999; Lyons, 1999; Scruton, 1995).

Plato's prescription for education included education first in gymnastics, music, reading, and writing. Later, students would be trained in elementary arithmetic, astronomy, and music. At a more advanced level, students were to be instructed in higher forms of arithmetic, geometry, and astronomy. According to Plato, education should

prepare individuals to become the ideal guardians, or rulers of the state. Education should continue throughout one's life, becoming more abstract and philosophical with an emphasis on mathematics and dialectic. The philosopher who completed Plato's educational program was prepared to serve as a ruler, leaving the more mundane tasks of society, such as construction and trade, to the slaves. The role of educated free men was to focus on the theoretical aspects of societal problems. In Plato's time there was a distinction between theoretical and practical knowledge and modes of inquiry that were based on the Greek social divisions.

The pre-Socratic Greek philosophers accounted for the continuity and change of the world observed through the senses as being comprised of some underlying substratum that took on a variety of forms. Plato revised this view and described reality as existing in the domain of *Ideas* rather than in a material substrate. Plato is the originator of the concept of universals – general terms or concepts that stand for something and which we use to differentiate one object from another.

Plato proposed that for every idea or mental concept we have there is a corresponding, objectively existing *Idea*. In his later philosophical works, Plato began to invest *Ideas* with objective reality and to believe they existed independent of real objects. In the dialogue *Meno*, Plato suggests that one might come to know forms as a result of knowledge from a previous incarnation. Plato presents a dialogue between Socrates and a slave boy, in which Socrates draws out from the child a mathematical theorem that he had never been taught. Plato suggests that the boy had a subconscious knowledge that had only to be drawn out by the teacher.

Plato came to believe in a transcendent realm inhabited by *Ideas* or forms. The realm where *Ideas* existed was the basis and stability of human knowledge. He described a dividing line between the physical world experienced through the senses and the transcendent realm where knowledge was gained, the world of the intellect. Plato put forth that particulars received by the senses were gathered together by the intellect to create general concepts and First Principles. However, Plato did not regard the truth of the world to be revealed through sense perception, but through reason alone. Plato described a deductive method by which individuals access knowledge in the realm of ideas and use them to create theorems. In general, Plato valued intellect and reasoning as a means to discover truth. He downplayed the use of the senses in the observation of physical phenomena (Oldroyd, 1986; Scruton, 1995).

Plato's student and critic, Aristotle (384 – 322 BC), also believed that the truth of the world is revealed through reason. Unlike Plato, however, Aristotle claimed that knowledge was either practical or theoretical. According to Aristotle, theoretical knowledge is eternal, unchanging, and is learned via logic and deductive reasoning; principles of knowledge that cannot be proved are intuited by means of induction. He described practical knowledge in terms of experiential learning. He considered ethics and politics as areas of knowledge that are learned by practical experience, and not abstract reasoning; in such fields one seeks wisdom (Lazarus, 1999; Scharfstein, 1998).

Aristotle's doctrine of categories included ten kinds of things that could be said about, or predicated, of a thing. The ten categories were substance, quantity, quality, relation, place, time position, state, action, and affection. It appears that he may have been engaged in an ontological inquiry with a purpose of combating Plato's doctrine of

real and existent *Ideas*. Aristotle was concerned with demonstrating that *Being* resides in individual objects perceived by the senses and not in transcendental universals or *Ideas* (Oldroyd, 1986).

Aristotle disagreed with Plato on his conception of emotions. Aristotle argued that emotions are a result of reason (cognition). According to Aristotle, reason must control emotion, but the arousal of emotion is dependent on reason and not a distinct function separate from the cognitive process. Aristotle did not believe in a soul; for him there was only living and non-living matter. Aristotle suggested that human feelings are caused by the way humans view the world around them (Lazarus, 1999; Lyons, 1999; Scharfstein, 1998).

Aristotle's theory of causation is complex; with four kinds of cause – material cause, the motive or efficient cause, the formal cause, and the final cause. The material and motive causes include the object under study and the motive of some entity to create or impact the material. In other words, a statue is materially made of marble and is now a statue because of the motivation of a human to reshape it from its original form. The final and formal causes are metaphysical in nature. The final cause is that some future state or condition 'causes' the present processes. Most modern scientists reject final cause as being metaphysically repugnant, although many of the world religions credited events to a final cause as inherent in God's divine purpose or plan. It is final cause, in Aristotle's estimation, that destines an acorn to become an oak tree. It is the teleological nature of Aristotle's philosophy that appealed later to Christian scholars.

The formal cause appears to have at least three aspects. First, it involves the essence of a thing in terms of genus and species. Second, the thing was formed by a

quality-less substrate (the hyle). Third, the thing was formed via a formula, or blueprint that determined its form. Aristotle claimed that all things are caused, that there are several causes of the same thing, and nothing is accidental (Oldroyd, 1986).

Aristotle created research teams to study various subjects and he wrote and published many books, which were carried and shared everywhere Greeks traveled. Alexander the Great was one of Aristotle's pupils and served as one of his field researchers, sending back reports to his teacher along with zoological and botanical samples. There was suddenly a new world of science that grew out of the philosophical tradition. Many of the Greek philosophers were also mathematicians and used mathematics to explore and understand nature and metaphysics (Van Doren, 1991).

Theophrastus (c. 372-287 BC) was a student of Aristotle. He assisted Aristotle in founding the Peripatetic school of philosophy (the Lyceum) in Athens. He became head of the school in 322 BC and produced two botanical works, *Historia Plantarum* (Natural History of Plants) and *De Causis Plantarum* (Reasons for Vegetable Growth), which were the authoritative treatises employed in the study of botany for the next 1,500 years. His works were translated into Latin in 1483 and dedicated to Pope Nicolas V (Tallack, 2001).

It is Euclid (c. 325-265 BC), an Alexandrian during the reign of Ptolemy I, who is credited with the most influential work in the history of mathematics. Little is known about the life of Euclid. His book *Elements* is not entirely an original work; it contains a distillation of all previous knowledge on mathematics. Euclid was noted as a teacher and his book became the standard by which Greek mathematics was measured. In *Elements* Euclid presents a series of axioms that cannot be proven, but which were accepted as true

by intuition such as that non-parallel lines meet at a point. Reasoning from these axioms he developed a series of theorems. It was not until the nineteenth century that Euclid's axioms were found not to be absolute truths (leading to the development of a new kind of geometry).

The Greek mathematician Archimedes (c. 290-212 BC) was born in Sicily and studied in Alexandria. He invented a water pump to raise water. He also invented a system of compound levers in pulley form that he demonstrated by single-handedly pulling a fully laden ship onto shore. Using the levers and pulleys, he designed war machines to assist King Hieron II in defending Syracuse from Roman invasion. He developed the law of hydrostatics, demonstrating that a body immersed in fluid will experience a weight loss equal to the weight of fluid displaced.

Hipparchus (c. 190-120 BC) combined Babylonian and Greek astronomy, adopted the 360-degree circle into Western mathematics, and converted Greek mathematical astronomy from a descriptive to a predictive science. Using geometry he developed trigonometry and determined that the earth was at its shortest distance from the sun on January 4 and at its farthest distance from the sun on July 4. He calculated the length of the month and was short by only 1 second. He measured the length of the year to be 365 days, 5 hours, and 55 minutes. His mathematics was so precise that he was able to identify a 1-degree change in coordinates of stars over the course of a century (which later was confirmed to be a 1-degree change every 71.7 years).

Expanding on Hipparchus' mathematics, Claudius Ptolemy (c. AD 90-168), an Alexandrian astronomer, geographer, and mathematician, published *Almagest*. *Almagest* was adopted as a serious astronomical text for nearly 1,400 years. In his book, Ptolemy

suggested that the heavens are perfectly spherical with earth at the center of the universe, which was its natural place according to Aristotle's cosmology. Ptolemy described the earth as stationary, with the universe revolving around the earth. His most influential contribution was his mathematical description of the movement of the planets. His mathematics were complicated and produced a reasonably accurate prediction of the positions of the planets. He also wrote extensively on astrology and geography.

Galen (c. AD 130-201), a Greek physician, was educated in Pergamon, near the Aegean coast of modern Turkey, where he was exposed to the medical teachings of Hippocrates, the anatomical and physiological teachings of other Greek physicians, and the philosophy of Plato and Aristotle. He believed that a good physician should incorporate the natural sciences and the principles of logic in the pursuit of medical investigations. He was a prolific writer and developed a rational system of medical philosophy. He taught anatomy courses, using animals for research and demonstration (human dissection was forbidden). He thought four fluids (or humours) permeated the body – yellow bile, blood, phlegm, and black bile. The fluids were modified by the four stages of life (childhood, youth, adulthood, and old age), the four seasons, the four elements (fire, air, water, earth), and four qualities (warmth, moisture, coldness, and dryness). There were also three kinds of vapors or spirits within the body that formed the three principal organs – the heart, liver, and brain. He conjectured that disease was a result of a disturbance in the humours and could be alleviated through bloodletting (Tallack, 2001).

The teachings of Plato were adopted and modified by the Neo-Platonists (as they were later named in the nineteenth century) into a theory of creation. The founder of Neo-

Platonism, Plotinus (AD 205-270), received his philosophic education (which included geometry, arithmetic, mechanics, optics, and music) in Alexandria and he later settled in Rome. He was a devout follower of Plato, claiming that Plato was the only philosopher to gain the secrets of ancient wisdom. His writing incorporated two distinct styles, either rhetorical or dialectic. The dialectic method used a string of questions and answers designed to engage and compel the intellect. He claims to have experienced union with God, being lifted out of his body and then once again reunited with his physical form. His metaphysical philosophy incorporated the Good (or One), the Intellect, and the Soul.

Plotinus was philosophically opposed to materialism, pointing out that matter is heavy, helpless, and cruel. He accepted Aristotle's definition of matter as nothing but potentiality. To Plotinus, matter is simply a phantom, nonbeing – that which requires another substance in order to produce body. Absent of matter, Plotinus built a hierarchy on immaterial principles, or universals. Following Plato he saw reality as concentrated in oneness. He asked:

What could anything be if it was not one? For if things are deprived of the one which is predicated of them they are not those things. For an army does not exist if it is not one, nor a chorus or a flock if they do not have their one, since the house is one and so is the ship, and if they lose it the house is no longer a house nor the ship a ship. Plotinus (as cited in Sharfstein, 1998, p. 213)

The *Intellect* comes second to *Oneness* in Plotinus' hierarchy, moving from oneness to plurality. Here he rejects the Aristotelian view that thought thinking is supreme in itself. He credits the existence of the *Intellect* to the *One*; the *Intellect* is merely the substance of the *One*, as heat is the substance of fire. Although the concept of the *One* is metaphysical, Plotinus used reason as a means to demonstrate the existence of

the *One* and *Intellect*. Salvation of the Soul was achieved through virtue and slowly acquired wisdom. His writings played a significant role in the development of the personal philosophy of St. Augustine, a Christian leader in the fifth century, and therefore he affected the theology of all of Christendom in the Middle Ages (Scharfstein, 1998; Van Doren, 1991).

The consequences of the Greek period are significant. Greek development of science and formalized methods for discovery and sharing of knowledge changed the world. Prior to the time of Plato, there was no distinction between myth and history. Even Herodotus, the first historian, writing in the 430s and 420s, BC treated Homer, Hesiod, and the Trojan war with the same status. Despite written records, the past was not something that was fixed. Reinterpretation for the audience was considered acceptable. With the advent of science, philosophers began to argue for the idea of one truth vs. many truths about anything. Greek logic argued that there was a knowable relationship between the knower and the known. The Greeks were famous for questioning everything, including the sacred beliefs of all indigenous people among whom they traveled (Osborne, 1997).

Ancient Rome (753 BC – AD 337)

Rome absorbed Greek culture, including a Roman version of Greek religion, moral philosophy (Stoicism), and literature. Over the centuries, Romans came into contact with all the religions in the Mediterranean, adding each to their collection, including Christianity. By the beginning of the Christian era, Rome had over one million inhabitants. The population ranged from the very poor in tenement style housing to the very wealthy in palatial estates. It was the shared religions of Rome that held the society

together. Festivals that celebrated religious and public events brought the citizenry together in a shared celebration of Rome, including its conquests and its gods (Stambaugh, 2000).

Roman society was divided between citizens and non-citizens; non-citizens were either free or slaves. Slavery was pervasive throughout Roman society; it provided the manpower required to satiate the Roman appetite for food and luxurious lifestyle. Slaves and their children were subjugated physically, economically, and sexually. The supply of slaves was supported by the Roman wars, which brought in millions of captives, and later by slave raiding and slave-trading (Davies, 1996).

As Roman power grew, so did the Roman system of slavery. Slaves made up 35 percent of the population of Italy under Emperor Augustus (31BC-AD 14), qualifying Rome as one of the few slave societies in human history. Slaves were an important source of productivity. Slaves worked in every setting, from the killing fields of the mines and gladiator games, to the large rural estates of the aristocracy. Slaves were also used as businessmen and craftsmen, supplying a life of leisure for their masters and mistresses. Even poor Romans were likely to own at least one slave. Slave owning was an expression of power. Parades of victory in Rome, celebrating conquest in battle, included prisoners of war; some were executed, others were sold in the slave market.

Romans who were captured in battle were taken as slaves. Romans equated slavery to death and considered a person who failed to return from battle as having died at the moment he was captured. The association of death with slavery is based on the origin of slavery in warfare. The victor had the right to kill the vanquished. If the vanquished were spared rather than killed it was simply a condition of suspended death at

the discretion of the conqueror. The slave's identity and life were dependent on the owner.

Slavery was so ubiquitous in Roman life that Roman children were schooled at an early age on the exercise of power over the slaves. The language exercises, called *colloquia*, were scenes from everyday life in which children practiced the command of slaves. Colloquia established the structure of authority and the expectation in children that they had the capacity and the right to give orders for the rest of their lives.

Slaves, in contrast, lived their lives in a state of suspended death. They could claim no human rights or privileges of any kind. Slaves could claim no family ties and they could not own property or material goods of any kind. Slave owners had no obligation to maintain family ties or to keep the children of slaves with their parents. Children born to slaves remained slaves. The only source of freedom was at the slaveowner's discretion. Abuse of slaves was common, including beatings, and striking slaves in fits of anger.

There was a hierarchy within the slave population. The hierarchy may be the primary reason that the large slave population did not unite to rebel against their situation. Slaves were not a homogenous group. Although many worked in miserable conditions within the mines, in domestic life slaves could earn positions of merit that conferred privileges that even free men did not obtain. Many slaves took pride in the families to whom they belonged. The hierarchy fractured the slave population and allowed slaves to be slave owners (although all slave property was ultimately the free slaveowners). The slave career, which did not include retirement, depended on the individual *familia*. Slaves within highly influential households had a range of career

opportunities. For example, slaves within the *familia* of Emperor Tiberius were given opportunity to hold posts within the government.

Slavery provided the economic base for Roman society. There were principles taught on the management of slaves. Slaveowners were encouraged not to permit job sharing. Job sharing would encourage and permit laziness and reduce personal accountability. As a result, there was a sharp division of work. The concern was to extract “high performance from a work force that had no inherent interest in either the quality or the rate of work being done (Bradley, 2000, p. 63). Segregation of tasks created an incentive for personal performance and pride in work (Bradley, 2000; Davies, 1996).

Women enjoyed fewer restrictions in Roman society. Women were allowed to participate in public life (social events) and to own land. However, fathers held supreme power over their households, including their daughters. A father’s power could be transferred to his daughter’s husband, but only if he consented to give up his power. There was a legal provision, *sine manu* (without authority), by which a woman remained part of her own family rather than coming under the control of her husband. Women from poorer households worked outside the home, especially in shops or bakeries. Despite greater freedom in Roman society, women were barred from civil service and denied any public status (Blundell, 2000; McWhirter, 2000).

Roman society placed an emphasis on conquest and luxury. As a result, Rome’s genius lay in advances in law, military organization, administration, and engineering. Romans were more interested in practical mathematical achievements in engineering than in advancing mathematical theory. Roman numerals, which were additive rather than multiples of ten, did not lend themselves well to advanced calculation. Although the

Greeks developed mathematical and astronomical theory, these fields were not adopted in Roman culture. Mathematics was set aside and later discovered and developed in the Arab world during the ninth century (the word for algebra is derived from the Arabic *al*, the; *jabr*, reunion – as in broken parts), as was astronomy. Scientific advancement took a hiatus during Roman dominion (Davies, 1996; McWhirter, 2000).

Christian Philosophy

The era of the Greek philosophers lasted until the advent of Christianity. The ancient world was pagan; Romans were allowed to worship freely, and a variety of religions flourished. Meanwhile, a new monotheistic religion called Christianity, originally a sect of Judaism, began to be practiced by Jews in the eastern Mediterranean. The story of the birth of Christianity is recorded in the New Testament of the Christian Bible. Christianity is based on faith in a Jewish messiah, Jesus Christ, as the Son of God. Many Jews considered Jesus a physical messiah rather than a spiritual messiah and felt that he arrived to free them from Roman rule. Jews who opposed the message of Jesus as messiah sought to have their Roman rulers kill Jesus. Roman officials in Palestine believed that anyone who could stir up such controversy was a threat to Roman rule and in AD 33 the Roman governor, Pontius Pilate, ordered that Jesus be crucified in accordance with Roman law.

Following His death, followers of Jesus began preaching a message of salvation through Jesus Christ. Small groups throughout the Mediterranean world accepted this message and came to be known as Christians. A Roman convert named Paul (having changed his name from Saul) traveled and spread Christianity among non-Jews

throughout Asia Minor. Other disciples of Jesus helped found churches in Rome, Greece, Egypt, Gaul, and Spain (Farah & Karls, 1997).

Christians rejected Roman deities and refused to honor the emperor as a god. As a result, when local officials arrested Christians for causing trouble, those who refused to give up their beliefs were executed, often by throwing them into the stadiums to be killed by wild beasts for the viewing pleasure of Roman crowds. Nero, emperor of Rome during Paul's visit to Rome in AD 64, ordered the persecution of Christians. Such persecutions continued through the late third century when Diocletian and his co-emperors decided that Christians posed a threat to the new order they were trying to create. During his reign, which lasted from AD 285 to 305, Diocletian attempted to annihilate all Christians, dramatically reducing the numbers of Christians. Diocletian retired in AD 305 (Farah & Karls, 1997; Gress, 1998).

Diocletian left the role of emperor open to Constantine, who assumed the role in AD 312. Born in AD 280 Constantine witnessed the torture and murder of Christians under Diocletian's rule, which may have affected him deeply. During a battle to gain the throne, Constantine, while sleeping in his tent, dreamt that an angel descended from heaven holding a cross, and spoke to him saying '*In hoc signo vinces*' ('In this sign thou shalt conquer'). Upon waking, Constantine ordered his soldiers to paint the Christian symbol of the cross on all their shields and standards; from that day forward he became a committed Christian. Named emperor of Rome in AD 312, Constantine made Christianity the official religion of the empire, although he allowed freedom of worship for all religions. Constantine died in 337; during the twenty-five years of his reign,

Christianity increased in size and influence throughout the Roman world (Farah & Karls, 1997; Otto of Freising, 1972; Van Doren, 1991).

Christianity overthrew the naturalistic conception of the ancient world and changed the meaning of life and death. The third century AD marked the acceptance of Christianity as the state religion in Rome and the closing period of Greek philosophy with the establishment of Neoplatonism in Rome, which fused the most important elements of Aristotelian and Stoic systems with Eastern mysticism. By AD 410, when barbarians invaded Rome, it was a Christian country that they conquered. Romans who held to ancient religions and continued to worship pagan deities blamed the Christians who rejected these deities as the reason for the defeat of Rome (Kumar, 1995; Popkin & Stroll, 1993; Scharfstein, 1998).

Christians were quick to respond to the accusations. The most famous was the great theologian Aurelius Augustinus (St. Augustine AD 354-430). Augustine was born in Tagaste, a town in North Africa, to a Christian mother and a pagan father. A late convert to Christianity, Augustine was educated with a strong emphasis on Latin texts. His education in philosophy was limited, primarily because he never mastered Greek. He began his professional career as a schoolteacher in Tagaste, and then as a professor at Carthage. In 383 he moved to Rome and then Milan. During his years of teaching, Augustine rejected Christianity and turned to Manichaeism, a philosophico-religion that emphasized two universal principles of Good and Evil. Manichaeism fell short of providing Augustine with the answers he was seeking, so he shifted his attention to the doctrines of Plotinus, the founder of Neoplatonism. He also met and was influenced by St. Ambrose, who emphasized a spiritual explanation of the Old Testament. In his

Confessions, Augustine credits the voice of a child, overheard in a garden in Milan, with his taking up the Bible and reading a verse (Romans 13:13) that prompted his conversion to Christianity. Shortly thereafter, Augustine resigned his teaching post and became a priest, and was promoted to the role of bishop of Hippo. He spent the rest of his life engaging in religious controversy, performing his duties as a bishop, and writing books (Gay & Cavanaugh, 1972a; Van Doren, 1991).

In response to the accusations that Christianity was responsible for the defeat of Rome, St. Augustine wrote *The City of God* (AD 413-426). He began by noting that the barbarians who invaded Rome spared all who took refuge in Christian churches, not daring to invoke the wrath of God. Those Romans who lived through the sacking of Rome owed their life to the Christians, and therefore the Christian religion could not be blamed for the fall of Rome. More importantly, Augustine laid out a plan of world history, demonstrating the struggle between two cities – one human, the other spiritual. In this history Augustine was not concerned with a physical history of the world; in fact he was a poor historian. He did not research history, claiming that one cannot know that which is outside one's own experience; his history was based on a belief in the Bible and the purpose of God in building a Heavenly City. He wrote of God's plan for mankind. The human city is secondary and irrelevant in comparison to the heavenly city.

The City of God reflects the influence of Plato and the intellectual mysticism of Plotinus on Augustine's philosophy. He proclaimed that Christ promised the City of God, and that the Beatitudes of the Sermon on the Mount frame the constitution of the City. Augustine claimed that the two cities would vie for dominance until the end of time.

And thus it has come to pass, that though there are very many and great nations all over the earth, whose rites and customs, speech, arms, and

dress, are distinguished by marked difference, yet there are no more than two kinds of human society, which we may justly call two cities, according to the language of our Scriptures. The one consists of those who wish to live after the flesh, the other of those who wish to live after the spirit; and when they several achieve what they wish, they live in peace, each after their kind...Accordingly, two cities have been formed by two loves: the earthly by the love of self even to the contempt of God; the heavenly by the love of God, even to the contempt of self (Augustine, 1972, p 289 and 291-292)

According to Augustine, Pax Romana was the City of Man. Augustine claimed that the Heavenly City (the inward revealing of the Word of God) was born out of the ashes of the fall of Rome. Under Augustine, human history took on a new meaning and theme. Catholic Christians adopted his reinterpretation of history without question for over a thousand years; he claimed that the goal of Christians is in another life and their city is not of this world (Augustine, 1972; Farah & Karls, 1997; Gay & Cavanaugh, 1972a; Haugeland, 2000; Van Doren, 1991).

Prior to Christianity, the Greeks and Romans held a contained view of God. *Reason* was elevated and metaphysics were explained in light of *Reason*. During the Middle Ages, while most people were struggling to survive and accepted a version of Christianity dictated by the church, the upper classes became obsessed with the concept of God. They thought about God, studied God, and attempted to ascertain and comply with His will. The new science was God. That science was influenced heavily by the writings of St. Augustine. Individually and inwardly, the greatest minds in Christian Europe during the Middle Ages were dedicated to understanding the City of God. They arrived at answers and then spent time in monastic schools and universities examining and disputing them. It was generally held that contemplation was the highest form of service to God and so the best and brightest men and women of the age dedicated

themselves to it and were silent to the world. They did not write down their discoveries, they were not interested in telling others; the ultimate peace was acquired at an individual level, the reward being the discoveries. Outwardly and corporately, the church played a much more visible role in medieval Europe (Van Doren, 1991).

The Christian church became more than a religion, in the broadest sense it was also a state, a civilization. Christianity spread throughout Europe; the Church provided a basis for power that put ecclesiastics in positions of political power. During the Middle Ages (AD 300-1500) there was a rise in the merchant class, the development of Universities, and an increase in demand for books, which were still produced by hand. The Christian church adopted and maintained the vestiges of Roman civilization with its judicial system and hierarchy of officials. The Church was able to function as a government. In rural Europe the parish was the center of social life and the parish priest the source of contact with the outside world. From AD 1100 onward, men willingly devoted their time, skill, and money to the building of beautiful cathedrals – evidence of the centrality of the Church to daily life.

During the medieval Dark Ages the monasteries served as a haven for culture and preserved the industrial arts and husbandry. The monasteries also took responsibility for the repair of roads and bridges. Labor was promoted as a virtue and a duty to society. The division of society into sharply defined classes of workers, warriors, and clergy was the result of living conditions rather than deliberate design, and people were born into their station. The Church sanctified the feudal system in its entirety, partly because it was one of the greatest landowners in Europe, and therefore dependent on the class system for

support, and partly because the technology of the time provided no other means to carry on social life (Botsford, 1936a).

The introduction of Aristotelian philosophy in the mid-thirteenth century created a great revival of philosophical and theological study. Philosophers during the Middle Ages focused on understanding the Old and New Testament. Thomas Aquinas (1225-1274), a realist in a Platonic sense, and a prolific writer and teacher of theology, synthesized Christian theology with Aristotelianism. Aquinas believed that human reason substantiated sacred doctrine and he used Aristotle's philosophy on demonstration to argue the existence of a human soul (Scharfstein, 1998).

In opposition to realists like Aquinas (the dominating philosophy of the time), William Ockham (1285-1347) presented a radical philosophy. Ockham argued there were no universal categories of objects (such as particular animal species), and that humans arbitrarily group objects or qualities. He was the first to argue that universals are not things, but signs; and that a single sign can represent many things. Ockham's philosophy was not accepted in his time, but did prevail four centuries later when John Locke eloquently argued the nominalist position (Kenny, 1998; Oldroyd, 1986).

The predominant Aristotelian philosophy of the thirteenth century supported groupings as part of the natural order and that the groupings are deduced by means of *reason* and not empirical evidence. Ockham argued that reason is subordinate to and dependent on empirical evidence, which is based in observation by use of the senses. The revival of the long-drawn out and continuing debate about the nature of Universals in intellectual and philosophic circles between the nominalists (empiricists) and realists (rationalism) set the stage later for the Renaissance period (Scruton, 1995).

Islamic Philosophy

The birthplace of Islam is the Arabian Peninsula, home of the Arabs. Located between the Red Sea and the Persian Gulf the peninsula was geographically remote, which kept the empire of the north from invading Arab lands. In ancient times, many of the Arabs were Bedouin nomads, who herded sheep, camels, and goats and lived in tents. Bedouin society was comprised of tribes, each headed by a Sheikh. The tribes raided one another and warfare was part of Arab life.

By the sixth century, towns began to develop in and around oases or fertile valleys. Makkah (Mecca) became one of the most important towns. Located at a crossroads in trade traffic, Makkah was a center of Arabic culture and wealth. People from all over the Arabian Peninsula traveled to Makkah to trade and to worship at the peninsula's holiest shrine, the Kaaba, which housed the various statues of the many Arab deities.

As trade expanded so did the exchange of ideas. Contact with the Byzantines, Persians, and Ethiopians introduced the teachings of Judaism and Christianity. The monotheism of Judaism and Christianity were appealing to Arabs, who had become dissatisfied with their old idol-worshipping beliefs. Holy men, known as hanifs, adopted monotheism, yet rejected Judaism and Christianity, preferring to seek out an Arabic form of monotheism. It was into this environment that Muhammad was born in AD 570 (Farah & Karls, 1997).

Muhammad, who was orphaned as a young boy, was obliged to earn his livelihood as a shepherd. As a teen Muhammad took on work as a caravan leader on a trade route. His travels brought him into contact with a monk named Bahira, who

educated him on the principles of Christianity. Muhammad's reputation as an honest and able person prompted his employer, a wealthy widow named Khadija who was fifteen years his senior, to put him in charge of her affairs. At age 25, Muhammad married Khadija. With his newfound status, Muhammad was able to retire from commercial enterprises and devote himself to religious meditation and reflection.

Islamic tradition holds that Muhammad received a revelation, or vision, in AD 610. In the vision, he heard a voice calling him to be a prophet of the one true deity, Allah (the Arabic word for God). His charge was to recite, to preach, and to spread the teachings of this one true religion to the world. It is counted as a miracle that Muhammad, who could not read or write, was able to recite the Qur'an from memory, in perfect Arabic. Muhammad continued to receive divine messages via the angel Gabriel over the next twenty-two years. Faithful Muslims wrote or memorized his revelations, which were not compiled into one written collection until after Muhammad died.

Over the first three years of his mission, Muhammad won only fourteen new converts to Islam. One, who was influential in the ultimate success of the new religion, was his cousin Ali. In the fourth year of his mission, Muhammad publicly proclaimed his faith and preached against idolatry. In his preaching, Muhammad also condemned the idolatrous practices of the Christian Church, which by then had adopted the worship of images, relics, martyrs, Mary, and the saints.

Muhammad lived a humble life in comparison to his wealth. He declared that all who believed in Allah were equal; therefore the rich should share their wealth with the poor. His earliest converts, other than family members, were the poor in Makkian society. Most Makkians rejected Muhammad's message, fearing his attacks on the images at the

Kaaba would end the pilgrimages to Kaaba, thereby threatening trade with worshippers, the basis for their wealth. Fearing Muhammad's messages as a threat to their economy, the Makkan merchants persecuted Muhammad and the Muslims.

In AD 622 Muhammad relocated his followers to Yathrib, later renamed Madinat al-Nabi or Madinah (Medina), 'the city of the prophet.' Muhammad was accepted in Madinah as messenger of Allah, and as their ruler. In AD 624 Muhammad, in the Madinah Compact, laid the foundation for the Islamic State. Muhammad became the judge and leader of the new order. Muhammad placed all areas of life under divine law. The Qur'an, which is the written code of law for all Muslims, is a compilation of the revelations given to Muhammad over a period of 20 years.

Eventually the Makkans attacked Madinah. The Muslims retaliated and defeated the Makkans. In AD 630 Muhammad and his followers attacked Makkah. The Makkans put up little resistance, accepted Islam, and acknowledged Muhammad as a prophet of Allah. The Muslims destroyed the idols in the Kaaba and turned the shrine into an Islamic place of worship. Makkah became the spiritual capital and Madinah retained its position as a political capital of Islam.

The conquest of Makkah initiated a rapid spread of Islam. Muhammad led his followers on a trail of conquest throughout the Arabian Peninsula. Over the course of his life, Muhammad took twelve wives, some for political reasons. Of his children he had only one surviving daughter by Khadija, named Fatimah, whose descendents later formed the Shiite sect of Islam. Following Muhammad's death in AD 632, a group of prominent Muslims met and elected caliphs (successors) to lead Islam. The first four chosen were elected for life. The first caliph was one of Muhammad's father-in-laws, Abu Bakr. Abu-

Bakr is responsible for ordering Muslims to retrieve the written and oral messages from Muhammad and compiling them over the next twenty years into the Qur'an. The fourth caliph in line was Muhammad's son-in-law Ali, who was married to Muhammad's daughter, Fatimah.

The four caliphs led military forces that carried Islam beyond the Arabian Peninsula. By AD 650 they had conquered Palestine, Syria, Iraq, Persia, and Egypt. Their conquests reduced the Byzantine Empire to Asia Minor and brought the Persian Empire completely under Muslim control. By AD 656, when Ali was elected caliph, there were internal groups who rivaled for control of the caliphate. One of Ali's most powerful rivals was Mu'awiyah, the governor of Syria, who believed that Ali's supporters had murdered his uncle Uthman, who was the third caliph. In AD 661 Ali was murdered and Mu'awiyah assumed the caliphate, initiating the powerful Umayyad dynasty.

The followers of Ali, known as Shiites, rejected Mu'awiyah's rule. When he died in AD 680, they claimed the caliphate for Ali's son Husayn. Umayyad troops killed Husayn, precipitating a schism in the Islamic world. The majority of Muslims became known as Sunni (followers of the way) and continued with the election of caliphs. The Shiites, a smaller group of Muslims living mostly in Iraq and Iran, believed the caliphate should be held only by descendants of Muhammad through his daughter Fatimah and her husband Ali.

The Shiites and Sunnites differ on many points of law and theology. The Sunnites believe in a division between civil and religious authority. The Shiites believe that religious authority extends into politics. The Sunni Umayyad dynasty ruled from AD 661 to AD 750, relocating the capital from Madinah to Damascus, Syria. Umayyad warriors

carried Islam east toward India and China, and west across North Africa, and into Spain. By AD 716 the Muslims ruled most of Spain. Only the power of the Frankish Empire in France halted their advance into Western Europe (Farah & Karls, 1997).

During the eighth and ninth centuries, the majority of the Christian population that occupied the eastern and southern shores of the Mediterranean converted to Islam. The great churches of Syria, Palestine, Egypt, and North Africa collapsed and the Spanish Christian church suffered enormous losses. Many converted to Islam not only because of political aspirations, but also because of the attraction of Arabic literature and culture (Cantor, 1993).

Islamic territory expanded during the one hundred years following the death of Muhammad in AD 632 until the battle of Tours in AD 732, when the Franks defeated the Arabic armies invading France, which put a stop to their further advance north. Meanwhile, in AD 717 the Arabs were held back from invading Western Europe at the battle of Constantinople. The extensive Arab territory was consolidated under one rule until the middle of the eighth century, when the non-Arabic converts who had been conquered became dissatisfied with their position and demanded equal citizenship and government control. A revolt in the middle of the eighth century against the Omayyad dynasty (based in Damascus) resulted in a new dynasty, the Abbasids, who were mainly Persians. The new capital was relocated to Baghdad (Cantor, 1993).

The revolt signaled the beginning of political decentralization throughout the Islamic world. By the end of the ninth century, Islam was divided into several states. The rulers of the states continued to respect the caliph as the successor of the Prophet Muhammad, but political power lay in the hands of the rulers. The religious leaders of

Islam also split into three distinct groups, which still prevail – the Sunnis, whose orthodox tradition is based strictly on the Qur'an; the Shiites, who claim prophets who are descendants of Fatima; and the Sufists, who are Moslem mystics who seek a direct relationship with God (Cantor, 1993).

Early Islam stressed the equality of all believers; however, as with other communities, men and women had distinct roles and rights. A woman's social position was defined by her relationship as a wife, mother, daughter, or sister to the male members of her family. Women's rights were protected to some degree. A man was allowed up to four wives, but the Qur'an required that all be treated equally. A woman was allowed to own property and to keep the property she brought into her marriage. A woman could also inherit property. Divorce and remarriage were also permitted.

Many Muslim women learned to read and write, but women usually stayed in the home and did not participate in public life. Men and women were separated in the mosque. In the home, a woman was entitled to her own rooms. Women managed the household servants, some of whom were slaves. Men worked outside the home in a variety of businesses. Muslim boys entered mosque school at age seven and were taught to read and write. Those who desired to continue their education did so at madrasas, or theological schools, where they studied the classical literature of Islam (Farah & Karls, 1997).

The Arabic scholars of the tenth and eleventh centuries were the great philosophers and scientists of their age, from whom the Europeans in the twelfth and thirteen centuries were to derive their knowledge. During the eighth century the Greek philosophic and scientific writings were translated into Arabic with the assistance of

Greek scholars. Aristotelian and other Greek scientific writings spread westward through the Islamic world and reached Spain by the end of the ninth century.

In the tenth and eleventh centuries mathematics was almost exclusively an Arabic science. Muslim mathematicians invented algebra; their work in geometry led to the development of trigonometry. Mathematics was applied to solving problems in daily life, such as building, surveying, or devising pumps and fountains. Muslim astronomers observed the skies and made physical and mathematical models of the universe. They accurately predicted solar eclipses and proved the affect of the moon on the oceans. Using an improved version of the Greek astrolabe, they were able to measure the size and circumference of the earth with an accuracy that was unmatched until the 1900s. Muslim geographers determined that the world was round and produced the first accurate maps of the Eastern Hemisphere. They also traveled widely to gain firsthand knowledge of the earth's surface, climates, and peoples. By the tenth and eleventh centuries, the cities of the Mediterranean world under Moslem rule resembled those of the Hellenistic and Roman empires in size and grandeur. The rich cultural and intellectual environment of the tenth and eleventh century Islamic world provided the backdrop for the development of Islamic philosophy, which incorporated Greek philosophy (Cantor, 1993; Farah & Karls, 1997).

Ibn Sina (AD 980-1037), whose full name was Abu 'Ali l-Husain ibn Sina, and who the Europeans named Avicenna, was an Iranian philosopher, physician, mathematician, astronomer, courtier, and vizier. He wrote more than one hundred works, including *The Canon of Medicine*, *The Cure of the Soul*, and *The Salvation of the Soul*. The *Canon* is a monumental volume that summarizes all of the medical knowledge of the

time. Translated into Latin, it was accepted as the authoritative treatise on medicine in medieval Europe. Muslim physicians studied and described the origins, differences, and treatment of diseases. They developed the classification system of chemical substances as animal, vegetable, or mineral that is still in use today. They also studied and described the circulation of blood and the functions of the heart and kidneys, and founded the science of optics. Muslim medicine was centuries ahead of medicine practiced in the West (Cantor, 1993; Farah & Karls, 1997; Scharfstein, 1998).

The *Cure* (for the ignorance of the soul) is Ibn Sina's major philosophic work and incorporates Aristotelian science, logic, physics, mathematics, and metaphysics. Ibn Sina considered Aristotle as the greatest of philosophers. He differed from Aristotle in his conception of God. Ibn Sina integrated Aristotelian, Platonic, and Muslim philosophy. He worked to reconcile the teachings of the Qu'ran with Greek philosophy, believing that religious truths could be analyzed using logic. He described God in Aristotelian terms – as pre-existent, the cause of all that is caused, as a single entity – the unmoved mover.

According to Ibn Sina, human beings are able to gain true (therefore scientific) knowledge because of their rational soul (Aristotle's *nous*). The source of knowledge is the cosmic Active Intellect from which it is possible to deduce and acquire secondary truths. The rational soul is independent of the human body and is only associated with the body during a person's life. It is this intellectual intuition that explains human knowledge. For Ibn Sina, Muhammad was gifted with extraordinary intellectual intuition.

Like Plotinus, Ibn Sina sees no contradiction between the rational structure of the universe and a metaphysical presence of God. He sees the universe as eternal, "pervaded by soul, united (like the Stoics') by 'sympathy' and responsive to powerful ideas, he can

allow miracles, magic, and the influence of (true, unmechanical) prayer” (Scharfstein, 1998, p. 300). Ibn Sina’s philosophy contradicted some of the precepts of Islam. His philosophy denied omniscience of God, negated the creation of the world, and denied personal immortality in lieu of an afterlife where the human soul reunited with the universal Intelligence.

The same conclusions were drawn by the Spanish Moslem philosopher Ibn Rushd (d. 1198), whom the western church called Averroes. Building on Aristotelian science, Ibn Rushd was explicit in denying personal immortality and in upholding the doctrine of the universal Intelligence (universal soul). Thomas Aquinas referred to him as ‘the commentator’ on Aristotle. Ibn Rushd believed that God is the mechanistic mover of the universe, entirely removed from interference in human life; science demonstrates the eternity of the universe and denies the Islamic doctrine of creation. Despite his philosophy, he claimed to be a devout Moslem and credited the contradiction between science and revelation to the existence of a ‘double truth.’ According to Ibn Rushd, the human mind was incapable of understanding the link between the truth of science and the truth of revelation.

Up until the twelfth century, religious and intellectual leadership was separate. Scholars who had little to do with orthodoxy dominated intellectual life; philosophy and science were in the hands of scholars in professional fields, such as medicine, education, and government, which allowed these fields to flourish. Islamic religious leaders were either fundamentalists or religious legalists who had never attempted to construct a rational basis to their theology based on Aristotelian science. By the latter part of the eleventh century, these religious leaders began to take issue with their secular, intellectual

peers. Religious leaders were angered by the philosophy of Ibn Sina and Ibn Rushd; their philosophies were considered an attempt to insult and undermine the Islamic faith. The religious leaders convinced the Moslem princes to stop the speculations of the secular intelligentsia. The teachings of Ibn Rushd were condemned, the great schools declined, and the Moslem world passed into a long period of tyrannical fanaticism and ignorance. As the doors to exploration and speculation were closed in the Moslem world, their science and philosophy made its way into western Europe, exerting a powerful influence on the course of Christian philosophy in the thirteenth and fourteenth centuries (Cantor, 1993; Farah & Karls, 1997; Scharfstein, 1998).

ACT ONE

Scene 2

ADAM: Wow, Minerva, I had no idea.

BILL: Do you see how science, philosophy, and how we practice our daily lives all become entwined and inter-connected?

ADAM: Yeah, it's kinda interesting how knowledge was passed from one culture to another. But I still don't get how all this plays into the business world today.

BILL: Well, philosophy includes theology, our perspective on the universe, and ethics. Ethics pertains to how we treat each other.

ADAM: Yeah, so?

BILL: Haven't you taken a course on business ethics?

ADAM: Yup, and with all the cultural stuff going on anymore it's all relative.

MINERVA: Really – no rights or wrongs?

ADAM: Well, some things are always wrong, you know, like killing someone.

MINERVA: But that has not always been so. This is where the study of philosophy is particularly important. Do you know what you believe and why? Is your philosophy based on what is culturally appropriate or on some other set of factors?

ADAM: (squirming) I don't know, Minerva – if we say its ok – you know, legal – then it's ok – isn't it?

IRENE: There are times when what is legal is not considered moral by other societies.

MINERVA: Yes, and out of the ashes of one society grows another. For example, with the fall of Rome, a new medieval society emerged...

Medieval Society (AD c.330 – 1300)

The marvel of Rome is its long history and the interdependence that developed between Rome and the rest of Europe. Roman law, first written on the Twelve Tables in 390 BC, remained in effect for almost 1,000 years. By AD 120, Roman law governed the entire Mediterranean world and much of Western Europe, heavily influencing the development of the Catholic Church in Medieval society (Farah & Karls, 1997).

European medieval civilization was not the product of any series of events, but was the result of the absorption by Western Europe of particular ways of life, ideas, and religious attitudes from the Mediterranean world. It was the interaction with Rome that gave birth to 'Christendom', the foundation of European civilization (Cantor, 1993; Davies, 1996).

The fall of Rome is attributed to the invasion of barbarians, both through migration as well as conquest. The barbarians who invaded Rome in the fifth century

were seeking inclusion in Roman society as much as they were seeking conquest.

Germanic tribes began entering the Roman Empire in the late 300s seeking warmer climate, better grazing lands, and protection from the Huns who were invading Germany from central Asia. Some of the tribes were socially and culturally equivalent to Roman peasants; others were primitive and lived up to the name 'barbarian'. The Romans labeled the Germanic tribes barbarians, in reference to their language, which sounded like unintelligible babble to the Romans.

During the late fourth century and into the fifth century, Germanic tribes extended their hold over Roman territory. As early as AD 406, Rome was beginning to lose control of large areas of Gaul (France), Spain, and North Africa. In AD 410 a Visigothic chief, Alaric, captured and sacked Rome. Although the Germans and Romans combined forces in 451 to stop the Huns, Attila was able to plunder and terrify the people of Italy. Attila died in 453 and the Huns retreated to eastern Europe, but the eastern Roman Empire was left weakened and open to attack by Germanic tribes. The Roman Empire ended in the late 400s, but Roman culture survived. The Germanic rulers adopted the Latin language, Roman laws, and the Christian Church (Cantor, 1993; Farah & Karls, 1997).

After Rome's fall from power, the Byzantine Empire, centered in Constantinople, became known as the New Rome. Lands once part of the Greek world were now part of the Byzantine Empire. Byzantine people spoke Greek, stressed their Greek heritage, adopted a distinct form of Christianity known as Eastern Orthodoxy, and intermingled these with cultural influences from eastern civilizations. Between AD 500 and AD 1200, the Byzantine civilization was one of the most advanced in the world and enjoyed a higher standard of living than civilizations in western Europe.

Meanwhile, in Western Europe, the Germanic invasions had all but destroyed the social structure of the Roman Empire. Where there once was one great social and economic organization, there were now hundreds of small communities. Most of the Greeks left the west and migrated to Constantinople. The invading tribes of barbarians were illiterate. In the century between AD 450 and AD 500, the world of western Europeans became small and closed in. People withdrew into their own communities and life became hard, with most people dependent on what they could produce with their own hands. Since there was little or no law, people had to provide for their own protection. Between the all-consuming labors required to provide for and protect themselves, western Europeans had no time for the leisure activities that Roman citizens enjoyed a century before (Van Doren, 1991).

As the State of Rome disintegrated, people turned to the church for leadership. The first pope, who was the bishopric of Rome, was Pope Leo I, usually called St. Leo the Great, and held his position from AD 440-461. Leo was a member of an old aristocratic Roman family. Sensing the demise of the Roman State, Leo attempted negotiations with the barbarians in 452 (with the Huns) and 455 (with the Vandals). It is significant that the Pope, and therefore the church, took the role of defending Rome rather than the emperor. Leo also claimed the power of the bishop of Rome, the Pope, to oversee the entire church. He claimed that Peter, as the first bishop of Rome, was appointed by Christ to oversee the Church, and that each of his successors were granted absolute power over the Church. The Latin-speaking Christians of the West accepted the pope as head of all the churches. The Greek-speaking Christians in the East rejected the authority of Rome. Eventually these churches split, creating the Roman Catholic Church

and the Eastern Orthodox Church. The fall of the Roman State in the west laid the foundations for papal power in Medieval Europe. Medieval civilization is often referred to as theocratic, meaning that the world-view was dominated by an all-pervasive concept of the Christian God (Cantor; 1993; Davies, 1996; Farah and Karls, 1997).

In the fifth century, the Franks emerged as the strongest of the Germanic tribes. In 481 a warrior named Clovis became king of the Franks. In 496 Clovis was baptized, along with his whole army, by the archbishop of Rheims. Clovis converted in a shrewd move to garner support from Rome for further conquest. As a Catholic champion, Clovis was hailed as the next Constantine. With the support of the Church, Clovis proceeded to conquer Gaul and established Paris as his capital. Clovis, with the support of the Church, enjoyed a stable reign. However, the Frank custom of dividing kingdoms among heirs contributed to the creation of the feudal system of the Middle Ages, and the disintegration of central authority (Cantor, 1993; Farah & Karls, 1997; Gress, 1998).

By AD 550, Rome, which once boasted over a million inhabitants, held fewer than fifty thousand residents. The incursion of barbarians into Rome plunged Europe into a period now referred to as the Dark Ages, which lasted for five hundred years, and is marked by the progressive dismemberment of the Roman world. By 600 the Roman and Frankish societies had completely merged and a new French social structure appeared. The new French society was divided between landlords, clergy, townsmen, a large group of dependent serfs, peasants, and slaves. The serf was not a slave, but was bound to the land, yet retained certain legal and economic rights. The lord was supposed to provide protection and land for sustenance in exchange for labor or a share of the serf's crops. Some serfs prospered, while others lived on the verge of starvation. Despite their

economic status, all serfs were bound legally to the lord's estate (or manor) and were subject to the jurisdiction of the lord's manorial court (Cantor, 1993; Davies, 1996).

In terms of individual freedom, the serf was probably better off than the slave on the Roman estate, but their existence was reduced to a state of survival. In the sixth century, the peasants received little support from the Church. Peasants who received sacrament from a visiting priest more than once a year were considered fortunate. Peasants blended the worship of nature with Christianity, and with a hodgepodge of saints, relics, and demons. Pope Gregory I the Great encouraged and cultivated the popular religion of saint worship, relics, and miracles.

By AD 600 urban life had practically disappeared. Not more than three percent of the French populace were townspeople. The ruling class of lords, bishops, and important abbots constituted no more than two percent of the population. Modest lords and soldiers made up approximately twenty-five percent of the population. The remaining seventy percent of the population were peasants and lower clergy, of whom only ten percent managed to maintain a free status.

The aristocrats and royal princes were interested only in building wealth and power. Most of their lives were spent in warfare. Christianity was reduced to a system of magic, miracles, and saints. The concepts of justice, peace, and mercy were non-existent. The only advancement over Roman society during this period was the status of women. Frankish women were more independent of their fathers and brothers, were allowed to own property and play a role in political life. Female independence dissipated after AD 700 as the Frankish nobility became Romanized and Christianized, adopting the

traditions of Roman law and relegating the status of women to that of subservience (Cantor, 1993).

In AD 768 Charlemagne (also known as Charles the Great) became the Frankish king. During his reign he nearly doubled the borders of his kingdom to include Germany, France, northern Spain, and most of Italy. The Franco-papal alliance between Charlemagne and the Pope was consummated in AD 800 when Pope Leo III crowned Charlemagne and proclaimed him 'Caesar' and 'Augustus'. Pope Leo had no right to confer the title, and Charlemagne had no right to receive it. Having claimed the right, the Frankish kingdom was elevated and dependent on the Pope for its new status (Davies, 1996).

It was Charlemagne's forceful personality that held his empire together. Following his death in AD 814, his son Louis the Pious was not able to maintain a unified empire. Fighting between Charlemagne's three grandsons led to a division of the empire between the three of them in the Treaty of Verdun in AD 843. During the battles for control of the empire, the Vikings from the north, Muslims from North Africa, and the Slavs in the east took advantage of the instability. Incursion from all sides ravaged the empire, severely weakening the central authority of monarchs; the result was a rise in feudalism, which took hold as the political and social order of central Europe (Farah & Karls, 1997).

The tie between military service and land ownership that characterized feudalism began in the AD 700s during the reign of Charles Martel. Martel adopted the granting of fiefs (estates with peasants) as a means to recruit and arm warriors to fight the Moslem

invasion of France. He defeated the Islamic army at the Battle of Tours in AD 732, halting the spread of Islam into western Europe.

Frankish kings expanded the system by granting fiefs to counts and local officials. Over time these nobles assumed many of the powers of government, including raising armies, meting out justice, and in some instances, minting coins. In exchange for the land grant, the nobles swore an oath of loyalty and pledged military support to the king (Farah & Karls, 1997).

By the tenth century the arrangements between nobles and kings emerged as feudalism. Lords were allowed to pass their lands on to their heirs. A hierarchy of nobility emerged; each lord was a vassal – a noble serving a lord of the next higher rank. Knights (mounted warriors) were at the bottom of the nobility hierarchy. A noble could be both a lord and a vassal, with obligations to more than one lord.

The lack of a strong central government led to frequent warfare. Castles were built as a means of protection. The nobility lived and ruled from within the castle. Within his fief, a lord had almost total authority. He collected rent from the peasants and served as judge between his vassals. Education in the Middle Ages consisted of training in the art of war. A nobleman's son began training at the age of seven; first as a page, or assistant, in the house of a lord. At age fifteen, the page became a squire, assisting a knight and learning the use of weapons. Once he proved himself in battle, he was knighted (Farah & Karls, 1997).

Western Europe closed itself off from the culturally, scientifically, and economically advanced Islamic world on its western and southern borders. Western people looked upon the Moslems as perverse and dangerous heretics. As a result, they

shunned anything Islamic, depriving them of any benefits of association. It was not until the end of the tenth century that the hatred the Christians felt toward the Islamic tradition was outweighed by the obvious advantages gained through study at Cordoba, Spain.

It was not until the tenth century that Europeans adopted technologies that had been available in the Mediterranean world for centuries. Europeans imported the horse collar and stirrup, giving them much greater use of available horsepower. The introduction of watermills facilitated the production and availability of food supply. Waterpower was used to operate sawmills.

Frenchman Gerbert of Aurillac, who later became Pope Sylvester II, traveled to Moslem Spain to study philosophy and mathematics. The education he received in Spain made him so intellectually superior to his Christian contemporaries that he was regarded for centuries as a possessor of mystical powers of sorcery and black magic. Gerbert served as the tutor to Otto III, who assumed the throne over the German Empire in AD 983. Gerbert and other churchmen in the German court convinced Otto that he should renew the Roman Empire. Otto moved his court to Rome and placed Gerbert on the papal throne as Sylvester II. Otto proclaimed Rome as the capital of the world, and the Latin Church as the mother of all churches.

Otto died in AD 1002 and Gerbert in AD 1003. Following their deaths, Otto's successor, his cousin Henry II, abandoned Otto's plans and moved the royal power back to Germany. Although their plans were abandoned, the reign of Otto, in partnership with Gerbert, marked the first opening for the transfer of knowledge from the Islamic world to western Europe. By AD 1050 the first trade routes from central Europe to northern Italy facilitated the exchange of Mediterranean luxuries for European textiles. The northern

Italian cities served as centers for the transfer of Moslem trade. With the development of trade came an incursion of French knights who aspired to gain a share of the wealth of the Islamic world. Normans and Frenchmen joined the struggle against the Moslems in northern Spain. The advance of western Europe into Moslem domains brought about the first crusade of AD 1095.

The new civilization formed out of the union of the Latin Christian and Germanic cultures eagerly sought the opportunities to be found in newly acquired knowledge. By AD 1050 every country in Western Europe had adopted new technologies. Europe no longer lagged behind the Byzantium and Islamic worlds. In all areas of human activity new discoveries and enterprises were being pursued.

The period from AD 1050 to 1130 was one of enormous commercial expansion. It was a period that witnessed the first really successful medieval monarchy, created in Anglo-Norman England. It was an age in which the new European civilization interacted with the old Mediterranean world, ending a long period of separation. It was an age of renewed intellectual vitality. New contributions to Latin Christian theology were advanced, and universities were formed. Roman law was studied for the first time since the German invasion of the fifth century.

Accompanying commercial expansion was the expansion of the church. By the middle of the eleventh century, many of the nobles and commoners took the teachings of the church seriously. Nobles provided financial support for monasteries and cathedrals. Lay people undertook pilgrimages and there was a universal respect for the monks. A movement began among the Benedictine order advocating more stringent monastic

ideals. The financial support of the nobles enabled monks to adopt a higher form of asceticism. Many took vows of poverty and advocated the renunciation of worldly gain.

The prominent men in the papal court in the 1050s were all monks; these men promoted a new asceticism for the whole church, and subsequently to the whole world. The Gregorian reformers, as they came to be known, sought a unified Christian world system. Named after Pope Gregory VII (1073-1085), these reformers promoted a fully celibate priesthood. At the time, bishops commonly cohabited with women, fathering children and looking after the interests of their families. Parish priests were typically married. There was strong opposition to Gregorian views of clerical celibacy. Despite the opposition, the Gregorians developed the doctrines of plenitude of power, papal infallibility, and subservience of the monarchy to the priesthood.

Pope Gregory VII opposed the class-based society of eleventh century Europe. He took an active interest in supporting the poor. He took on social activism, promoting a Christian social gospel for the first time in medieval civilization. He taught that poor Christians are spiritually superior, encouraging the underprivileged and engendering a spirit of social disaffection that eventually played a role in the dissolution of the medieval world order.

In AD 1075 the German emperor Henry IV was the most powerful ruler in Europe. Undaunted in his program of reform, Gregory VII demanded that Henry give up the institution of lay investiture, in which secular rulers gave the symbols of office to the bishops they appointed. He threatened to depose Henry if he did not obey the decree. Gregory's attack on the power of the monarchy marked the beginning of a fifty-year struggle that framed the future of Germany (Cantor, 1993; Farah & Karls, 1997).

The power of Henry's empire lay in the authority he held over the church. The control of church resources and personnel had enabled his father, Henry III, to rule Germany. Following the death of Henry III, the loyalty of the episcopate saved the throne for the young Henry IV. Henry IV became king in AD 1056; by AD 1075 he had won a complete victory over the rebellion of the German nobles and peasants. It was at this juncture that Gregory VII delivered his decree. The German churchmen were willing participants with Henry in opposing Gregory. In AD 1076 the clerical scholars sent a reply to Gregory under signature of King Henry. The letter refuted Gregory's claim to the papacy, provided a clear defense of the prevailing world order, and declared war on the pope who would attempt to dissolve this beneficial system.

Gregory's response was to depose Henry and to send papal agents into Germany to stir up a new rebellion. German bishops and abbots were ordered not to recognize Henry as king on threat of excommunication. The immediate effect was a collapse of royal power. Two-thirds of Henry's army came from ecclesiastical lands – he lost the largest share of his military power without a battle. The only course left to Henry was to seek absolution from Pope Gregory, which he did. Henry regrouped and a year later made his intentions to wage war with the papacy. Gregory once again deposed him, but this time Henry was prepared. By AD 1085 Henry drove Gregory into exile where he died. Subsequent popes were entwined in the controversy and were unable to find a way out of the conflict. It was not until 1122 that the church made peace with Henry V (son of Henry IV). In the Concordat of Worms of 1122, Henry gave up the practice of investiture in exchange for the right to require homage from the bishops and abbots in his domain. In

effect, the emperor maintained the right to exercise a veto over the appointment of German ecclesiastics.

A similar compromise was signed between the pope and England in 1107 after a four-year English investiture controversy. The arrangement was designed to appease the papal desire to appoint bishops and abbots, and the ruler's desire to control the affairs of the church in his realm. The difference was that the fifty-year battle between the pope and the German emperor brought about extensive changes to the German political and social structure. The feudal system took root in Germany. The great lords imposed homage on their knights and developed feudal armies. The power granted by the church benefited local territorial princes. In effect, Henry V and his successors were granted the right to control the appointments of clerics only within territories belonging to their own families. Germany was no longer dominated by a monarchy. The vassals of the great lords were not bound to the king. The power of the monarchy was further diminished when the German nobility re-instituted the electoral appointment of the king. Following the death of Henry V in 1125, the king was chosen by the princes, given no resources, and prevented from exercising any control in the realm.

The fifty-year battle also drained other resources in Germany. In AD 1050 Germany was the intellectual leader in Western Europe. German monasteries and schools were centers of learning, art, theology and canon law. During the long civil war and disputes with the papacy, churchmen focused on issues of the church-state relationship, ignoring other endeavors. German intellectual life stagnated, leaving it backward and archaic in comparison to the rest of Western Europe (Cantor, 1993).

Elsewhere in Europe, French and Italian scholars were creating universities and in the process of rediscovering ancient works in philosophy and mathematics. Otto of Freising (1113-1158) was one such scholar. Otto was a grandson of Emperor Henry IV of Germany. He was sent to Paris to study, participating in the Aristotelian renaissance underway in France. In 1133 he joined the Cistercian Order and entered a monastery in Morimund, France. He traveled to Rome in 1145. In 1146 he joined the Second Crusade, reaching Jerusalem in 1148. He then returned to Germany for the last ten years of his life. Otto is noted as 'the first philosopher of history.' His most celebrated work is his *Chronicle of the Two Cities* (1143-1147). In the *Chronicle*, he endeavored to record the course of history from the Creation down to 1146. His history includes Christian and classical historians, documentary evidence, and a critical assessment of the motives of men (Gay & Cavanaugh, 1972b).

Adopting a type of Augustinian philosophy, Otto wrote of two cities – the visible (earthly) and the invisible (spiritual). He was distressed by the struggles between the pope and the emperor; he was both a brother to the emperor and a servant to the pope. He wrote with candor, albeit with a Christian bias, about the development of the Church and State. Otto described the Catholic world-view of the roles of the church and king.

Two roles, they say, have been established by God in the Church: the priestly and the kingly. Of these the priest ought to administer the sacraments of Christ and to render ecclesiastical judgements with the sword of the spirit. The other bears a material sword, for the exercise of secular judgments against the enemies of the Church, by defending the poor and the churches of God from the assaults of evil men, and by punishing the wicked (Otto of Freising, 1972, p. 375).

Otto reflected that God desired a division between the duties of king and church. In this manner, the church could care for the spirit of man, while the king could vanquish evil in

defense of the church. He advocated the practice of appointing a king through election by the people, and ordained by the church; in this manner, the plan of God will be fulfilled – emperors could not wrongly designate a successor, nor could the Church usurp illegitimate control of the material world.

Otto's history is biased; it is illuminated by his philosophy and written based on his perceptions of the will of God. Assuming he reflected the predominant philosophy of eleventh century Europe, it becomes apparent that the predominant Catholic world-view relegated all events as the will of God, therefore justifying the growth of the European feudal system as a system ordained by God. Otto, viewing history from an eleventh century perspective, saw the attack on the Church as the work of the devil, but viewed other European defeats as righteous judgement from God for the deficiencies of the kings. Otto noted that all the emperors after Constantine (other than a few) were orthodox Catholics. As a result, he claimed that the two cities became one, the City of Christ, containing the good and the bad. He noted

However, the faithless city of unbelieving Jews and Gentiles still remains, but, since nobler kingdoms have been won by our people, while these unbelieving Jews and Gentiles are insignificant not only in the sight of God but even in that of the world, hardly anything done by these unbelievers is found to be worthy of record or to be handed on to posterity (Otto of Freising, 1972).

This uncritical view of the place of 'unbelieving Jews and Gentiles' provides insight on the treatment of non-Catholics during the Middle Ages.

It wasn't only in the spirit of winning the world for Christ that Christendom set out on the crusades. The ideology of a holy war present in the crusades developed out of the struggle between Christians and Moslems in Spain. The Moslems conquered the Iberian Peninsula in the eighth century. Several of the Christian princes fled with their

followers into the northern mountains; their descendants launched the *Reconquista* in the tenth century. By 1100, the Spanish Christians reclaimed portions of the country, completing the expulsion of all Moslems in 1492. Christian kings ruled the greatest share of the Iberian Peninsula after the middle of the thirteenth century. Through five centuries of war, Spanish Christians eventually adopted an ideology that was similar to the Islamic concept of *jihad*, or holy war, with its doctrine that it was better to die for a higher moral cause than to live with infidels. Religious fanaticism and war in the name of religion became the symbols of valor in Spanish society (Cantor, 1993).

The Gregorian papacy found the *Reconquista* worthy of imitation. In AD 1095 Pope Urban II, successor to Pope Gregory VII, called for a Christian army to defeat the Turks who had attacked and conquered the Byzantine Empire. His goals were fivefold. First, a crusade would help reunite Christendom following the divisive dispute between Pope Gregory VII and Emperor Henry IV. Second, it would improve papal prestige. Third, it would help repair the schism between the western and eastern Greek orthodox churches. Fourth, knowing that he would gain little support from Germany and the Anglo-Normans, his army would be comprised predominantly of his native Frenchmen; the crusade would serve as a convenient way to remedy the problem of land shortages for feudal princes. Fifth, was to recapture the Holy Sepulchre from the Muslims.

In a speech delivered at the synod of Clermont in Auvergne, Urban II appealed to French noblemen and knights to join the crusade

I exhort you...to strive to expel that wicked race from our Christian lands...Christ commands it. Remission of sins will be granted for those going thither...Let those who are accustomed to wage private war wastefully even against believers go forth against the infidels...Let those who have lived by plundering be soldiers of Christ; let those who formerly contended against brothers and relations rightly fight barbarians; let those

who were recently hired for a few pieces of silver win their eternal reward (Farah & Karls, 1997, p. 319).

Adopting the fanaticism of the Reconquista, as well as the concept of Qur'anic assurance of heaven for spiritual warriors, Urban (as the keeper of the keys to the kingdom of heaven) promised all crusaders plenary indulgence for their sins. The crowd responded with the cry *Deus vult* (God wills it). Men clamored to join; red cloaks were cut into strips and sewn onto the fronts of tunics in the form of the cross (Cantor, 1993; Farah & Karls, 1997; Davies, 1996).

Urban underestimated the power of his call for a crusade. Preachers, such as Peter the Hermit, spread word of the holy call for a crusade. While it took a year before the first group of knights could set out on their expedition, there was an immediate and explosive 'people's crusade' that formed, consisting of unruly mobs from the poor, including Germans. These mobs committed pogroms on prosperous Jewish communities within their own cities, and then moved across Europe, arriving in Constantinople. The Byzantine emperor immediately transported the mob to Hellespont, where they battled and were exterminated by the Turks (Cantor, 1993; Davies, 1996).

Pope Urban, although surprised by the reaction of the lower classes, chose to ignore their pogroms and focused on launching an army of crusaders from the French nobility and Norman Italians. While there were a number of self-interested motives, it is likely that many took up the cross in the first crusade for primarily religious reasons. The crusaders set out in 1096, following the route set by the people's crusade, marching through Germany and the Balkans to Byzantium. The Franks, like the mobs, massacred Jews in Rhenish cities and abused the Balkan people.

The Greeks of Byzantium were less than eager to receive the help of the Latin Church as delivered by the crude Frankish crusaders. The Franks, an uncouth and relatively young civilization, came face to face with their older, more cultured, and also more decadent, forebearers. Fearing that the crusaders were more interested in sacking Byzantium than in rescuing them, the emperor transported the army across the straits of Asia Minor as quickly as possible. The crusaders marched on. With not more than 5000 warriors, the crusaders took on a larger, superior Moslem army. It was only the disunity among Moslem princes that allowed the crusaders to claim victory.

The crusaders marched through Asia Minor, and into Syria. In AD 1099 a ragged army of crusaders captured Jerusalem. The army slaughtered Jewish and Muslim inhabitants, including women and children. The first crusade of AD 1096 created the Latin Kingdom of Jerusalem; subsequent crusades were mounted in an attempt to protect this small strip of territory to no avail. In 1187 Jerusalem was lost to Moslem invaders and the Latin Kingdom was fully extinguished in 1291. The loss of the Latin Kingdom was not due to lack of military power. If they so desired, the papacy and the European monarchies could have mounted an army capable of crushing the Moslem armies. The kingdom fell because of a lack of interest. The crusading movement continued during the twelfth and thirteenth centuries, but more as a form of piety than out of true desire to defeat the Moslems.

King Louis VII of France and Conrad III of Germany led the second crusade of 1144. The two armies never reached Palestine. Defeated by Moslem forces in Asia Minor, the two kings returned home. The failure of the second crusade was repeated in

the third crusade of 1190. The crusade of 1190 commanded a large share of the military resources of Europe. Richard the Lion-hearted of England, Philip Augustus of France, and Frederick Barbarossa of Germany, all set out for the Holy Land with large armies. The German army faltered after the drowning of Frederick. Philip of Augustus was more interested in battling the English king Richard. Richard Coeur de Lion managed to antagonize almost every European ruler, increased hostilities with King Philip, and earned the hatred of the Germans. After a few minor battles, the Arabic leader, Saladin, accepted a token peace agreement that maintained the status quo. Richard, on the other hand, was land-locked, blocked from his return home by the armies of his enemies. Escaping into Germany, he was captured and held for ransom by Emperor Henry VI.

In the fourth crusade of 1204, Christendom turned on itself. Pope Innocent III ordered a crusade against the Moslems, but was foiled by a group of Venetians who funded the crusade. Innocent accepted a change of plans and sent the crusaders on a mission to conquer Constantinople. For the next 60 years, Latin princes ruled in Constantinople; the papacy used its power to bring the Greek churches under the authority of Rome. In 1261 a Greek prince regained the throne, but the internal strife weakened the empire, aiding its fall to the Moslems in 1453.

The papacy learned how to use the crusading movement to political advantage. In the thirteenth century, the popes used the crusades against their enemies within Europe. The abuse of papal power discredited it as a spiritual power. As the popes used crusades for political power, the Latin Kingdom of Jerusalem, lacking reinforcement from western Europe, sank into oblivion (Cantor, 1993).

The crusades made a significant impact on Western Europe. The success of the First Crusade reinforced the authority of the Church. The crusades legitimized the union of military force and religious devotion. Europeans learned that it was right and moral to kill and destroy in the name of service to Christian ideals. The split between the eastern and western Church was widened. The barriers between Christianity and Islam were strengthened, with each seeing the other as the aggressor (Cantor, 1993).

The Latin Church became a power broker, more influential in politics than in the lives of commoners. Resentment of church wealth was a growing problem. To remedy the problem, Pope Innocent III blessed two new orders of brothers, the Order of Preachers, founded by St. Dominic Guzman (1170-1221), and the Order of Friars Minor, founded by St. Francis of Assisi (c.1181-1226). The friars were instrumental in the development of universities in the twelfth century.

The crusades also helped to break down feudalism and increased the authority of the monarchies. Kings levied taxes and raised armies. Nobles sold land as a means to fund their crusading expeditions. From the Moslems, the crusaders gained new technology; they learned better shipbuilding, began to use the magnetic compass, obtained new military skills, and significantly improved their weaponry. Contact with the East created European demand for luxury goods, such as spices, sugar, exotic fruits, tapestries, silk, and other goods. European contact with the more advanced Byzantine and Moslem civilizations created an interest in culture and classical texts. Europe was on the verge of a twelfth century renaissance (Farah & Karls, 1997).

ACT ONE

Scene 3

Enter Toni and Mary Ann

MARY ANN: Hello everyone, nice afternoon. You all look deep in thought.

ADAM: Minerva is educating and entertaining us. Can't ski, so I might as well enjoy a good story and discussion.

TONI: Sounds good, what are you discussing?

BILL: The human story – the history of mankind.

MARY ANN: Sounds too deep for me!

IRENE: Actually, it's quite interesting. I have been an ardent student of the Bible for years and didn't know how much the ancient Greeks influenced my religion until now.

BILL: I knew about the influence of the Greeks, but didn't think much about it. I wasn't aware that the bulk of human knowledge was retained and preserved by the Arabic culture.

ADAM: Well, I was fascinated by the story about how the Church and military got together. I knew about the crusades but I didn't know the people in power used the authority of the Church to conquer the world around them.

BILL: That is exactly why its important to know what you believe and why – or you fall victim to whatever is culturally relevant.

ADAM: Ok, I get it Bill. But, Minerva, didn't the Church also do a lot of good?

MINERVA: Yes, but the good it did was based on the science of the day.

ADAM: What do you mean by that?

TONI: Do you mean that the science in any period of time affects the religious views?

MINERVA: To some degree, but more importantly, the *philosophic* views affect the science; and religion is philosophy. As philosophic views go, so goes the science.

We have to be open to new ideas in order to explore them.

TONI: I can agree with that thought. I find closed minds even among my high school students. Those that are open to new ideas ask the most intriguing questions; those that are stuck in one paradigm have a difficult time learning.

ABBY: (*getting up to throw another log on the fire*) What do you mean by paradigm?

TONI: A way of seeing the world. For example, some people would look at that bear skin rug over there and be upset that you would kill such a beautiful animal. They would feel justifiably indignant. But if you told them that you killed the bear because it killed your pet Labrador retriever and it was coming after you, their view would change and be in your favor.

MINERVA: You're right Toni. And the same thing applies in science. If my world-view only accepts the existence of a God who has empowered the clerics then I might not challenge that view in the absence of any other information. In a time like the medieval ages, there was no new information. The clerics were the educated elite. They enforced the rule of the Church and it favored their status. Even the twelfth century renaissance was focused on religion...

Twelfth Century Renaissance

Western Europeans, prior to the twelfth century, engaged in limited philosophic and scientific endeavors and exploration. The religious perspective of medieval

chroniclers and historians affects much of what is known about the Middle Ages. Their perspective, however, is pervasive of the periods about which they wrote. Both the west and east were largely theocratic. There is, however, a difference to be noted between the educated elite and the peasants of medieval society. The educated minority was predominantly noble-born, made up of clerics or pupils of clerics; therefore, the educated minority tended to adhere closely to religious teaching. The illiterate majority tended toward irreligious views, including pagan rituals, witchcraft, and heretical opinions. The practice of witchcraft developed in parallel with Christianity. The Church openly battled witchcraft, lending credence to the practice and adding to the hysteria about the craft. The Christianity of the peasants was laden with magic, spiritism, and relics.

Religious life was surrounded by mysticism. Throughout the Middle Ages, Church dogma was being formulated. The Lateran Council of 1215 made confession and penance obligatory. The concept of transubstantiation (the miraculous joining of the bread and wine transforming into the body and blood of Christ) was refined – only priests were allowed to partake of the wine of the chalice. Separation between the priestly caste and lay peoples was almost magical. The Inquisition of Toulouse in 1229 resulted in laymen being forbidden to read the Bible. The concept of the Virgin Mary as the mediator with Christ was adopted. Patron saints were adopted. The veneration of relics was widespread. This mystical tradition elevated religious intuition over logic.

Medieval perceptions of time and space were radically different than modern times. The seasons dictated behaviors. Calendars and sacred dates were the preserve of the Church. Geography was poorly defined. The workings of the human body were only minimally understood. It was not until the fourteenth century that medicine made any

notable advances in Europe. The central task for medieval philosophers, all of whom were churchmen, was to align Aristotelian ideals with religious dogma. Medieval science was also inextricably tied to theology. The scientists of the Middle Ages risked charges of sorcery for prying into the secrets of nature, thereby probing the domain of the Church (Davies, 1996).

The first movement toward a system of logic began in the eleventh century, when Pope Gregory VII commissioned a legal study in hopes of devising a legal system to support the authority of the Church. The medieval scholars discovered a long forgotten copy of Justinian law, the *Corpus Juris Civilis*. The *Corpus* envisioned and reflected a rationality of power based on a beneficent emperor. The *Corpus* described a legal system with judge and jury. The weakness of the system was the lack of provision for corruption. Judges were assumed to be paragons of virtue who held ultimate power in deciding the fate of the accused. The court system was an instrument of the State, used to maintain order in a civil society, assuming that the State was virtuous.

Scholars, blind to the deficiencies of the system, acclaimed the *Corpus* as superior to the Germanic legal system. On the basis of its superiority, studies were carried out for the benefit of wealthy businessmen who dominated urban governments. By the end of the eleventh century, a school of law was established in Bologna, which remained the center for the study of civil law through the end of the Middle Ages. The university produced lawyers who traveled throughout continental Europe. European governments were beginning to require the services of civil servants trained in law. The graduates of Bologna became the first bureaucrats. By the beginning of the twelfth century students

from France, England, and Germany were flocking to Bologna to acquire the new legal science.

German emperor Frederick I Barbossa was the first important European ruler to adopt the new civil law. Civil law supported his claims to the throne in the absence of papal blessing. By 1200 France adopted the use of civil lawyers for administration of the government, bringing with them the introduction of civil law. By the middle of the thirteenth century, French scholars used the Justinian code to validate the power of a king as the emperor in his own kingdom, possessing the absolute power attributable to the Roman emperor.

The Church also used the progress in the study of civil law to direct its own codification of the canon law. The canonists described the legal position of the pope in the church as identical to the emperor's in the state. The pope held all legislative power, while the Roman curia was held to be the supreme court of the church, with full appellate jurisdiction over other ecclesiastical courts in Europe. The codified canon law was published in 1140 and remains the foundation of canon law to the present day. With the adoption of codified canon law, the papacy now required men educated in law to staff its courts and bureaucratic offices. The new schools of civil law supplied the education; the graduates of these institutions had the option of secular service or specializing in canon law and entering service to the church. Legal training promised graduates an opportunity to ascend to the level of pope. Between 1150 and 1300 nearly every pope received his initial training in canon law. Unfortunately, these highly trained popes found it easier to deal with the administrative rather than the spiritual aspects of their office; they were

unprepared to deal with the emotional religiosity and heretical inclinations of their subjects.

The Roman legal system was not adopted in England. After the Romans abandoned Britain in the fifth century, Germanic Angles, Saxons, and Jutes invaded taking over much of Britain from the native Celts. In the late ninth century King Alfred of Wessex (Alfred the Great) united the island kingdoms and defeated the invading Danish Vikings. His united kingdom became known as Angleland (England). Alfred was interested in the revival of learning and hired scholars to translate Latin texts and to chronicle the history of England, known as the *Anglo-Saxon Chronicle* (Farah & Karls, 1997).

The kings following Alfred were weak and when the last Anglo-Saxon king, Edward the Confessor, died in 1066, three rivals claimed the throne. In a series of battles the victor for the crown was William, a Duke of Normandy, crowned William the Conqueror. During the founding of English royal power, between 1066 and 1135, the Anglo-Norman rulers perpetuated the legal system of the shire. Courts were dominated by prominent men within the shire, with oral pleading and ordeal the prime methods for proof in criminal proceedings, preserving the Germanic principle that law belonged to the community. The king presided at the royal court, but did not exert absolute control over it. The system was effective, inexpensive, and the use of a jury for administrative purposes at the local level allowed the government to operate with a minimal number of bureaucratic personnel. In 1135 King Henry II, great-grandson to William the Conqueror, established a common law throughout the kingdom. This system preserved a principle for the future that the law of the land rested in the legislative power of both the king and the

community, and not merely the demonstration of royal power (Cantor, 1993; Farah & Karls, 1997).

In the late eleventh century Europe was emerging from a period where the struggle to survive usurped all resources. Universities began to form in France, most notably in Paris, under the protection of wealthy bishops. With the end of the investiture conflicts, men turned their minds from debates over the nature of a Christian world to the study of philosophy, science, and theology. It was quickly becoming apparent that knowledge was power. A new generation of aspiring men set off to gain an education in the new cathedral schools and universities.

The mid-twelfth century witnessed the emergence of five great leaders of European thought, Abbot Suger, Peter Abelard, Bishop Otto of Freising, St. Bernard, and John of Salisbury. Abbot Suger, who supervised the reconstruction of the church of St. Denis, introduced a new architectural style, distinctively French, and as novel and fresh as the new intellectual pursuits. Suger became the chief minister and biographer of Louis VI and tutored Louis VII. Suger demonstrated a newfound ability to create something new out of the old order (Cantor, 1993).

John of Salisbury (d. 1180), an English cleric, was the epitome of the changes taking place in Europe. John was well educated in the new logic, philosophy and theology of the French schools. He became frustrated at what he considered the useless debates that threatened the Christian thought-world. He considered truth to be self-evident; the question was how to cultivate it in the next generation. He saw the newfound wealth, learning, and power as corrupt, undermining old values. He argued that the value of education was not intellectual, it was moral. John was grieved by the corrupt effect of

political power, including within the church. In 1159 he published *Policraticus*, a treatise on the righteous role of political life. He presented an optimistic view of the state, which merged the rightful supremacy of the church with the reality of expanding royal power. He ascribed moral qualities to the state and qualified his statements with an emphasis on the distinctions between a king and a tyrant (Cantor, 1993).

The writings of Bishop Otto of Freising picked up where John of Salisbury left off and introduced open optimism about the role of secular power. In Otto's book *The Deeds of Frederick Barbarossa*, he extols the virtue of Frederick, who he described as a hero who will rebuild the authority of the German crown and combine it with the Heavenly City he described in *The Two Cities*. Despite his devotion to the church, Otto relegated the pope to a secondary position in his description of heaven on earth. John of Salisbury reluctantly admitted the moral sanction of the state, through its usurping of moral authority; Otto advocated it. Otto provided a picture of the sovereign state of the thirteenth century, morally shrouded with a form of religiosity (Cantor, 1993; Gay & Cavanaugh, 1972b).

Peter Abelard (1079-1142) left the nether lands of the wild frontier region of Brittany to enter the new schools of philosophy and theology at Chartres and Paris. Recognized immediately as a brilliant student, he rapidly mastered the new dialectical methods. He was also brash, difficult, arrogant, and hypercritical. Challenging his teachers, Abelard took a few private pupils, including the brilliant and beautiful Heloise (c.1098-1164), the niece of Canon Fulbert of the Cathedral of Notre Dame de Paris. Abelard and Heloise had a son and were later secretly married, fearing that a public announcement of marriage would end Abelard's academic career. Canon Fulbert was

incensed by the secret marriage. He was convinced that Abelard intended to abandon Heloise and bring about her ruin. Fulbert hired a group of thugs who waylaid and castrated Abelard. Abelard's hopes of a career in the church were ruined. Abelard retreated to an abbey and convinced Heloise to enter a convent.

Heloise did not abandon Abelard. He continued to mentor her. They exchanged a series of love letters, which were later published. The collection of love letters has become one of the most beautiful and noted of the medieval books. Even as a eunuch, Abelard attracted a large body of students. He published various theological works, the most famous titled *Sic et Non* (Yes and No), which was a set of commentaries on how to resolve contradictions. The book became very popular and sparked battles between students as well as between students and teachers. He also wrote *Scito te ipsum* (Know Thyself), in which he advocated that sin was not inherent in an act, but in intention. Abelard demonstrated a clear preference for reason over faith. His work challenged the dominant Augustinism of his time and appealed to the Aristotelians, encouraging them to advance the cause of reason over the mysticism of the old way.

Abelard undermined the Platonic structure of early medieval thought. Not since St. Augustine, had a medieval personality published either a biography or an autobiography. The concept of personality had been subsumed in a Platonic concern for ideal types. Chronicles of the kings did not touch on personal idiosyncrasies and personalities. Abelard's autobiography *The History of My Calamities* marked the rediscovery of personality in literature. He did not portray himself as part of the universal and ideal, but as an individual. He seemed to take joy in revealing the particulars of his life, even to the point of creating drama and shocking the reader.

Abelard also contributed to the debate on the nature of universals. His views on universals was also a challenge to the Platonic view that the general and universal were everything, while the particular and individual were nothing. The debate, which began in the late eleventh century, was carried into the universities of the twelfth century. The debate over universals centered on the problem of whether general concepts in our minds, either esoteric or physical, have an existence outside our own minds. When men speak of the idea of truth or the idea of a tree, are they using vague terms or are they describing a self-subsisting universal that has an existence separate of human speech and thought? Plato's system was based on the belief in the reality of universals. Before the eleventh century all medieval thinkers subscribed to Platonic realism. With the rediscovery of Aristotelianism, the new logicians were eager to test Platonic doctrines.

Abelard's aggressive personality and great following of students made it appear as if he was leading an attack on the Platonic foundations of the church. One of his students, Arnold of Brescia, later led a social revolt in Rome and was executed by Frederick Barbarossa. Leaders of society considered Abelard a subverter of Christian ideals, bent on corrupting the younger generation. When Abelard's book on the Trinity appeared, it confirmed the fears of conservative clerics. Abelard, using dialectical juxtaposition, presented contradictory propositions of the Trinity without resolving them. He appeared to be mocking the greatest mystery of the Christian faith. Abelard was denounced by St. Bernard for publishing heretical doctrines and was summoned before a church council where he was forced to recant (Cantor, 1993; Van Doren, 1991).

St. Bernard was a Cistercian monk and the abbot of Clairvaux. He opposed the work of the universities, claiming that those who learned were merely learning as a

means to gain attention and to be looked upon as learned. Bernard advocated a new piety in the twelfth century, popularizing the teaching of St. Anselm. Anselm taught that God became man as a way to provide salvation through divine grace and to show men and women how to live. Bernard also favored Anselm's veneration of the Virgin Mary.

Bernard was a popular, yet ill tempered and argumentative leader of the Cistercians, who played a significant role in society. From 1125-1153 he dominated the western church. He made popes (including Innocent II, one of his disciples), harassed kings, preached crusades, persecuted Jews, and then prohibited pogroms. Bernard worked toward a moral reformation of Europe, following a strict interpretation of Christian teachings. He condemned the rational approach to divine knowledge that was taught in the universities. Yet like Abelard, he was dissatisfied with the traditional means of revelation through the priests and sacraments.

Bernard believed in a direct union between God and the Christian soul. He believed in the direct intercession by the Virgin Mary. St. Bernard served as a leader in the development of the Virgin cult, which became the most prominent manifestation of twelfth century popular piety. Bernard taught that the Virgin Mary is an additional aspect of the deity, aiding Christ and the Holy Spirit in uniting God and man. Bernard also promoted a mystical union with God through beatific vision. He claimed that anyone who earnestly desired and sought union with Christ would be received and would escape the desire for corporeal things, eliminating the need for even the church and the sacraments. Bernard condemned the church as being infiltrated with a contagious corruption, accusing every rank of hierarchy in the church other than the pope of serving the devil. Compared to Bernard, Abelard appeared moderate (Cantor, 1993; Van Doren, 1991).

While Christendom struggled with Platonism, an Arabic philosopher and commentator, Averroes (1126-1198), was busy translating the works of Aristotle. Born in 1126 in Cordoba, Spain, Averroes was well educated and served as an advisor, judge, and physician to a series of caliphs. He lamented the fact the Islam did not hold women in the same regard as Plato. Averroes desired to elevate the role of philosophy to what he considered to be its rightful place in Islam. He failed to achieve his goal, but his translations and commentaries became very influential in the West.

Before the time of Averroes, the doctrines of Aristotle remained hidden and confusing to western scholars. Only Aristotle's *Organon*, translated by Boethius (b. AD 480), was available to Latin scholars. But *Organon* only dealt with laws of logic, thought, and the philosophic method. Averroes' translations and commentaries illuminated the full range of Aristotle's works (excluding *Politics*), earning him the name 'The Commentator'. His Arabic translations from the Greek were translated to Latin. Averroes was a devout Moslem. Seeing the danger in the secular nature of Aristotle's works he continually insisted that there was in fact only one truth, that being contained in the Qur'an. To western scholars it appeared that Averroes advocated the existence of two truths, one of nature and one of God, with two different logics and two different methods, both equally honorable. The commentaries challenged the doctrines of the Augustinians. The rediscovery of Aristotle was a fascination to the young scholars of Paris. The notion that the natural world, the City of Man, was as worthy of study as the City of God, opened up whole new areas for exploration (Van Doren, 1991).

The Thirteenth Century: Reframing the Christian World-view

At the advent of the thirteenth century, the power of the papacy was waning following a succession of weak popes between 1181-1198. In 1198, frustrated with the challenges of dealing with changes in learning and lay piety, the cardinals elected a strong leader, Lotario Conti, who took the title of Innocent III (1198-1216). At the time of his ascension Innocent was only thirty-seven years old, from a leading Roman aristocratic family, and trained as a canon lawyer. He claimed everything in the world as the province of the pope and set about to rebuild the power of the papacy. The well-educated Innocent III did not elect to use military power – instead he used his intellect and a variety of methods to assert his influence on the changing society of western Europe. By the time of his death in 1216, he accomplished his goals – papal power was reaffirmed and the church had counterattacked heresy, intellectual disorder, and secular power on every front.

The reforms that Innocent III introduced are summed up in the decrees of the Fourth Lateran Council of 1215, which still governs Catholic behavior in the twenty-first century. The Lateran Council set the number of Christian sacraments at seven: baptism, confirmation, marriage, extreme unction, the Eucharist (Mass), confession, and the ordination of priests. Only the church could confer these sacraments. In 1200 only about half the people in western Europe were married by a priest; the remainder still followed the Germanic tradition of cohabitation, frequently accompanied with the giving of a ring. Church marriage was now a necessity in order to assure legitimacy of offspring and uncontested inheritance. This also increased church control over divorce. What the priest, as a tool of God, brought together, could only be dissolved by the church.

Innocent III also increased the legal power of the papacy in the administration of the legal institutions of the church. In 1199 he established the first general income tax on European churchmen to support the papacy and its administration. He chose Italian cardinals as his representative to territorial churches. He directed the selection of bishops. After stabilizing his power over Rome, Innocent III concentrated his talents on the problem of controlling the northern monarchies. The timing of events played into his plans. Following the death of Henry VI of Germany, old feuds between the Hohenstaufens and the Guelphs erupted over the selection of the next emperor to the throne. Neither party selected Frederick II, Henry's son. Both parties courted the favor of Innocent III because only the pope had the authority to make one of the rival kings the emperor. Innocent waited three years to make his decision while civil war diminished German power. Finally, in 1200, he made his decision, selecting Otto IV of Brunswick, who acknowledged the boundaries of the papal state, surrendered royal authority over the German church, and promised not to intervene in Italy.

Otto broke his agreement in 1208 and invaded northern Italy. In 1212 Innocent III appointed Frederick II king of Germany and immediately went to work brokering an agreement between Frederick and Philip Augustus, king of France. In the battle of Bouvines in 1214 Philip inflicted a crushing defeat on Otto and opened the way for Frederick to gain the German throne.

Innocent III also used France as a means to subjugate King John of England. John and Innocent engaged in a bitter quarrel over the right of the pope to appoint English bishops. John refused to recognize Bishop Stephen Langton, an Englishman who was a theologian at Paris and later a cardinal in the Roman curia. John forbade Langton to enter

England. Innocent responded by placing England under interdict and suspending church services. John seized a large portion of the landed wealth of the English church. Innocent then encouraged Philip Augustus to prepare to invade England under papal banner. John, frightened that he would lose his entire kingdom to this old enemy, allowed Langton to enter England, pledged himself as a vassal to the pope and made England a fief of the papacy.

Innocent III allied himself with Philip Augustus in other ways. Innocent ordered the Albigensian crusade (now southern France) as a means to stop heresy and establish papal authority. The crusade opened the way for the expansion of French territory (which took place in the 1220s).

Innocent III exerted his control over individual lives through the use of Inquisitions. He commissioned legates to establish courts to deal with heretics. Panels of churchmen under papal rules of Inquisition operated these courts. The Inquisitors did not have to reveal informers. The accused was not entitled to confront the informers. If a defendant refused to confess, the Inquisitors were allowed to use torture in the traditional manner of Roman law in order to obtain the confession. For a first offense, if the defendant confessed and recanted, punishment was usually mild. On second offense, they would be subject to more severe punishment, including imprisonment and loss of property. Those with numerous repeat offenses were subject to death by burning. This practice was adopted as a general papal mandate in 1233. Over the course of the next several centuries, it is estimated that as many as 10,000 people may have died at the hands of Catholic Inquisitors.

Despite their record, the goal of the Inquisitors was not to kill their opponents; it was rather to bring them in to the fold of the Catholic Church, by persuasion if possible, by force if necessary. Innocent III held an uncompromising belief in the truth of the Catholic faith and the validity of the doctrines of the church; he put all of his considerable energy into furthering church doctrine. Innocent III saw the Jews as a threat to Roman Christianity. It was the Albigensian kabbalistic Jews – with their dualist theology of ancient Gnosticism – that prompted Innocent to order the Albigensian crusade. He forbade conversion of Jews to Christianity by force, but advocated ghettoization – their exclusion from European society. The Fourth Lateran Council decreed that Jews should wear a yellow label so they could be recognized as outcasts. This requirement had a long lasting impact on European Jews.

At the time of his death in 1216, Innocent achieved his main objectives, securing the power and influence of the Catholic Church in the physical world. His papacy initiated a period of renewed stability and peace in Europe. No major wars took place between the battle of Bouvines in 1214 until the 1290s. He did not, however, resolve the struggle that was going on in men's minds that were a result of the rediscovery of Aristotelian science. In order to harness this energy for the purposes of the church, Innocent established the Dominican and Franciscan orders in 1216 (Cantor, 1993; Davies, 1996).

The Dominicans (also known as the Order of Preachers) were to focus on the teaching of the truths of Catholic dogma and demonstrate their computability with science. The Franciscans (also known as the Order of Friars) were to focus on the emotional aspect of faith, appealing to man's heart rather than his reason.

The Dominican order attracted a steady stream of followers who became the clergy predominately responsible for confronting heresy. In the thirteenth century, the Inquisition was largely a Dominican institution. The attack of the Inquisition on heresy, reinforced by Franciscan ideals, brought about an end to heretical teachings in the church. By 1260 the Franciscans succeeded in channeling the intense spirituality of the lay people into enriching their Catholic Christianity (Cantor, 1993; Van Doren, 1991).

The Dominicans took on the challenge of Aristotelian science. By the middle of the thirteenth century, they came to dominate the University of Paris, which was a hot bed of debate. As intellectuals, they were confident that revelation and science were ultimately one truth. As church apologists, they sensed the necessity for a philosophical defense of Christian doctrine. It was a Dominican professor at Paris, Thomas Aquinas (1224/5-1274) who provided the defense.

Aquinas assumed his teaching position at the University of Paris in 1256 following decades of study under the Benedictines and Dominicans. With the new piety in the mid-thirteenth century, everyone was a theologian, either amateur or professional. Arguments over points of doctrine were carried out in public places and over dinner tables. The two overarching controversies of the time were the question of universals and Aristotle's notion of nature, how it was to be viewed and understood (Cantor, 1993; Van Doren, 1991).

The University of Paris added the writings of Aristotle (physical, metaphysical, and moral) as part of the arts curriculum in 1255 and declared them mandatory; rivalry with the faculty of theology was encouraged. When Aquinas arrived in 1256 he immediately threw himself into the writing of commentaries on twelve of Aristotle's

works. His commentaries are based on a commitment to Aristotelian demonstration with a deep abiding belief that the science of demonstration should not conflict with the science of revelation (theology). His *Summa Theologica*, begun in 1265 and left unfinished at his death, was intended for students of theology. In the *Summa* Aquinas did not use human reason to prove faith, as it would have detracted from the merit of believing; reason was employed as means by which he made the implications of Christian doctrines manifest. In the *Summa Theologica* the questions of doctrine were worked out in a sequence of units and subunits, creating a well-articulated structure.

Aquinas attempted to argue from the natural to the divine, reconciling Aristotelian metaphysics with Christian concepts of God. Thomas argued that we only know certain matters through revelation, and that we cannot have an insight into the nature of God. We can, however, demonstrate the existence of God. In the *Summa Theologica*, he presented his five famous proofs for the existence of God. He also argued that the human soul is nutritive, sensory, and rational; being rational, it must also be incorporeal, therefore existing on its own, acting independently. For Aquinas the human being is a single substance whose soul is imperishable. Each time a new human individual is born, God creates a new soul.

In *Summa Theologica*, Augustine also took on the question of free will. The omniscience of God raises the issue of human free will. If all creation is contingent on divine nature, and if nature is governed by necessity, then the world must follow a course in accordance with the laws, which express God's nature. If this is so, then how is human free will possible? Augustine answered this through the division of the City of God and the City of Man. With the acceptance of Aristotelian metaphysics, the question required a

new answer. Aquinas provided a doctrine of power and autonomy of human reason; he described practical reason as definitive of the active nature of man, which accounted for human freedom. He advocated for the good life described by Aristotle that could be identified on the basis of reason alone.

Opponents surrounded Aquinas. St. Bonaventura rejected his argument that man can arrive at a rational knowledge of God from the natural world, arguing that knowledge of God only comes from mystical union with the divine. The Christian followers of Averroes argued that man cannot know God through reason, but only from nature. The two groups were polarized, but did agree on one thing – the doctrine of two truths.

Aquinas tried to resolve once and for all the question of the two cities presented by St. Augustine. The premise of two truths underpinned the theology of the church for over a thousand years. Augustine viewed the two cities as existing in eternal conflict. Aquinas tried to bring them together, to write a guide to living a Christian life that had no internal contradictions.

Aquinas also turned his attention to political theory. Just as he broke with the Platonic tradition of the early Middle Ages in his interpretation of divine and human nature, he also created a revolution in political thought. The political doctrine of the early medieval period was heavily influenced by Augustine's hostility to the City of Man, denying the Greek view of a state as a moral being necessary to the fulfillment of human potentialities. Augustinianism became the political theory of the church, which made the state the servant of the church and gave the state moral sanction only in measure to its subjection to the papacy.

Beginning in the twelfth century, leading scholars began to delineate a new theory of the state. John of Salisbury and Otto of Freising took the first steps and Thomas Aquinas took the fledgling theories and formulated them into a precisely defined doctrine. As with his philosophic and theological work, Aquinas started with Aristotelian science. He accepted the premise in Aristotle's *Politics* that man required a moral state in order to fulfill his potentialities. Aquinas modified his politics to incorporate the Augustinian tradition, blending the moral quality of the state with the ultimate supremacy of the church in society. To accomplish this end Aquinas started with the law, stating that the law of the state had to conform to natural law, which was a reflection of divine law. This alignment of the law of the state with divine law gave it moral sanction.

In 1270 the bishop of Paris, disturbed by the radicalism of the various philosophers, condemned four propositions: that the soul is one, that human will is determined, that the world is eternal, and that there is no divine providence. In January 1274 Aquinas was summoned before a council at Lyons to answer for his opinion, was publicly chastised, but was not condemned. Aquinas died in 1274 while traveling to a local church. In 1277 the same bishop of Paris brought forward 219 propositions, a number of Aquinas' among them, and had them proclaimed heretical; the bishop declared that Aristotle could not be publicly read or taught at the university. Despite the order, the philosophy of Aristotle remained the educational mainstay at the university until the end of the seventeenth century (Cantor, 1993; Mercer, 1993; Scharfstein, 1998; Scruton, 1995; Seymour-Smith, 1998; Van Doren, 1991).

While the Dominicans dominated the intellectual life of France and Italy, the Franciscans were busy spreading their message to the ordinary townsmen of Europe,

trying to control the direction of the urban religiosity that produced the great anti-sacerdotal movement. The second half of the twelfth century was rife with attacks on the clergy. A movement referred to as anticlericalism was widespread, calling for the destruction of the Catholic Church hierarchy. This movement created a secondary and more seditious movement referred to as anti-sacerdotalism, which denied that the clergy held any power in their office and that the sacraments they administered were meaningless. St. Francis (1181/2-1226) set a goal to address the problem of anti-sacerdotalism by calling on all men to live the life of Christ as fully as possible. The saintly lives of his disciples, the 'little brothers', would serve to stir the hearts of men to follow their example. It was the simplest and most profound message, and it troubled church leaders as much as they admired St. Francis.

St. Francis adopted the life of a wandering teacher, healer, and friend of all creatures. He preached to men and to the animals, which he considered to be brothers. He ministered to the poor, the sick, the outcasts, and the lepers. He tried to lead the rich and powerful to live more Christ-like lives. His style of preaching was familiar to the populace; non-clerical saints traveled the countryside calling men to a personal relationship with Christ. Their preaching fomented the heresy of the anti-sacerdotal movement. But St. Francis was also different; he displayed a piety not seen in the previous saints. He carried on his body the stigmata, the wounds of Christ. He soon attracted men and women to his order, sending them throughout Italy to preach the Christian gospel.

The Franciscan brothers all adopted a vow of poverty. They were to support themselves through their labors or beg for their subsistence. They were to accept no

favors from the pope, and they were not to be ordained as priest. They were not to seek learning (unlike the Dominicans) because it was a snare and distraction.

These ideals raised concern among Innocent III and other ecclesiastical leaders. The principles of the Franciscan order were dangerously similar to the attitudes of the Waldensian heretics (anti-sacerdotal). The difference that appeased the pope was that St. Francis was a devout believer in the authority of the priesthood and the efficacy of the sacraments; in addition, he fully subordinated himself and the brothers to the hierarchy of the church. By order of Francis, only priests could administer the salvation of the Eucharist. St. Francis claimed such faith in the priesthood that he had confidence in the sacraments delivered even by a bad priest. Innocent realized that Francis was restoring the prestige and leadership of the church, inspiring confidence within the laity, and therefore supported him in his work.

The Franciscan movement appealed to lay people who were tired of church hierarchy, but who were not willing to risk heretical behavior. The teaching of St. Francis allowed Catholics to have a personal religious experience without leaving the church. This was the best of both worlds. The Franciscan movement spread quickly over Europe.

The papacy realized the power of the Franciscan movement and was eager to gain more control by turning it into a corporate model, similar to the Dominicans. Following the death of St. Francis, the leaders of the order, with papal encouragement, violated many of St. Francis' most fundamental principles. The Franciscans, and the Dominicans, became priests and were given authority to wander through the countryside and towns hearing confessions and administering the sacraments. The Franciscan friars also became learned and as well known as their Dominican brethren in the fields of philosophy and

science, serving as professors at Oxford. The views of the Franciscans found favor – their message supported a personal religious experience that equated to a spiritual status for lay people on par with the pope. The friars taught lessons using simple moralistic stories, transferring the concepts of Christianity into applicable principles. The Franciscans brought the power of a relationship with Christ directly to the layperson. The leveling power of the Franciscan message may be partly responsible for elevating the self-esteem of the common man and sowing the founding seeds of democracy and future revolt against the church (Cantor, 1993).

Thirteenth Century Society

As a new order emerged out of the creativity of the eleventh and twelfth centuries in regard to social structure, learning, and the arts, the old order held sway in other areas. Life in the cities was affected by the development of universities. Daily life in the country remained largely unaffected. There was a gulf between the nobles, the urban middle class, the educated elite, and the peasants of rural Europe.

As trade flourished in the eleventh and twelfth centuries an urban middle class emerged, comprised of merchants, bankers, and artisans. In Germany, members of the middle class were called burghers; in France, the bourgeoisie; and in England, burgesses. While the intellectual, ecclesiastical, and political leaders of thirteenth century Europe struggled with reframing their world based on the works of Aristotle, the less educated lords, burghers, and peasants struggled with the changes in their social systems.

Urban wealth underlay many of the problems faced by the papacy and the monarchs. Towns developed under the feudal system, with residents bound to the manor system in which the town developed. As these towns grew in size and became centers for

trade and religious pilgrimage (visiting the large cathedrals), the residents sought greater autonomy from the lords. The financial strains of the crusades prompted lords to make concessions in order to obtain money from the wealthy merchants. Towns created written charters that wrested control from the lords. Although the charters varied from town to town, there were some points in common. The privilege of farming revenues was almost universal. The town burgesses or burghers were allowed to collect the toll (tax) of the town market and pay the authority the sum authorized in the charter. Town courts were given authority to settle community disputes.

Many of the charters were less concerned with economic freedom as much as civic freedom. Birth rates were low and life cycles were short. Most towns could not sustain their own population through birth rates. Provisions were written into charters in order to attract new residents. For example, charters gave freedom to ‘villains’ who lived in the town walls for a year and a day – all crimes were forgiven. The promise of personal freedom attracted large numbers of serfs from the manors, increasing town populations. As trade created new wealth and urban prosperity, charters began to offer economic provisions to the merchant class (Botsford, 1936b; Davies, 1996).

Even though the introduction of money into society provided people with a way to improve their status, the caste into which a person was born still regulated his or her potential. The bureaucratization of church and government systems by civil lawyers provided commoners with a greater sense of control, but the system of landed owners still prevailed. In the thirteenth century, a wealthy merchant still enjoyed less privilege than a nobleman of modest wealth. In Italy and France, nobility tended to be involved in urban and city life. In Germany, the occasion of war between the multiple principalities kept the

nobility from intermingling and the effects of urbanization were minimal. As a result, German royalty became a distinct class that held itself in a superior position to nobility of lesser means. Most noblemen possessed only limited literacy and education; their writing and reading skills were limited to the local vernacular, excluding them from reading the Latin literature circulated at the university level. Most of the popular literature written for the nobility was in French, which had become the international language of the aristocracy.

Thirteenth century lords rarely attended a university, receiving most of their education at home. The students who flocked to the universities tended to come from the urbanized nobility in northern Italy and southern France. It was not until the end of the thirteenth century that rural nobles sent their sons to common law schools in London to receive a rudimentary education in law, mainly for the purpose of protecting their proprietary rights in an environment of increasing law suits (Cantor, 1993).

Women in noble families were typically educated in the management of the castle household. Marriages were arranged for political purposes. Women were married at a young age, typically in their mid-teens. Men, since they were responsible for the household, did not usually marry until age thirty or later. The status of a woman changed with marriage. In the thirteenth century castle, the only women present were usually the lady of the castle (the wife of the noble) and her daughters. All castle help, from the kitchen to the stable, were men. The wife was in charge of all household affairs, including castle defense if her husband was away (Bouchard, 2000).

The twelfth century renaissance did little to advance any science other than the science of religion. There were a few noted scholars, such as Franciscan Roger Bacon

(1214-1292) and the Chancellor of Oxford University Robert Grosseteste (c.1170-1253), but their works made little impact on daily life. Most of the scientific scholars of the thirteenth century were found in England, but the long arm of the church reached even this distant island nation. The advances in science were considered heresy. Roger Bacon spent fourteen years in prison for his 'suspect novelties', which included experiments in optics and machines and general attacks on corruption and superstition. Bacon attempted to verify knowledge using a scientific method and to read the original Greek in order to verify the accuracy of Latin Scriptures (Davies, 1996).

There were few advances in medicine during the Middle Ages. Most Latin medical texts relied solely on the ancient Greek, Roman, and Moslem medical scholars: Hippocrates, Galen, Soranos of Ephesus, Albuckasis, Hali Abbas, Rhazes, Ibn Sina, and Arib ibn Sa'id of Cordova. The arena of childbirth, despite the high incidence of mortality for both mother and child, was left to midwives and family members. The Latin texts, even if a woman was educated enough to read them, were devoid of information on the birthing process.

With a high mortality rate and the absence of medical science, society at large turned to the only science available – religion. Mothers, husbands, and relatives would appeal to divine aid through prayers, vows, visits to the shrines of saints, charms, and incantations. Priests were called in to pray for noble women. The use of 'birth girdles' was common. A carry over from the pre-Christian era and the English druids, the birth girdle was a belt covered with stones and amulets believed to aid in drawing out the child. The birth of infants who survived breach births was attributed to miracles.

Miscarriages, while common, were considered by many to be a punishment for sin (Shahar, 2000).

Despite short life spans and high infant mortality rates, the population of Europe rose during the medieval period. The long period of peace in the thirteenth century was conducive to population growth, which was only impaired by the inability to produce the food necessary to support the population. There was a thriving market for grains, wool, wine, mutton, and beef. Landlords sought ways to produce the largest yield from their estates. Minor improvements were made, such as the use of fertilizer, the development of a heavier more efficient plow, and improvement in harnesses enabling the use of horses rather than oxen in farming. These minor improvements did not, however, create scientific revolution. It would take a breaking away from the science of religion, the Platonic perspective of the universal that imbued medieval religion, and the power of the feudal system that supported the nobles, the monarchies, and the Catholic Church to bring about a scientific revolution. By the advent of the fourteenth century western Europe hung on the edge of transition between the medieval and the modern.

ACT ONE

Scene 4

The sun has set, the warm glow of the lamps lights the Great Room. The fire has died down to a bed of glowing embers. Abby stands up and stretches...

ABBY: My goodness Minerva, you've kept me in my seat all day. It's a good thing

David brought us in a lunch, but I had better get us all a hot dinner.

MINERVA: Sorry, I told you I had a fascination in the history of science and philosophy.

ADAM: I'm sure glad I wasn't born in the medieval days – the movies always romanticize it. Sounds like pretty tough times. There didn't seem to be much change in people's living conditions after the fall of Rome.

MINERVA: No, it wasn't until the Renaissance that western civilization rediscovered the Greek scholars and we began to enjoy scientific advances that improved the quality of life.

ADAM: I suppose the advances in science improved business?

MINERVA: Of course. But the advances in science were accompanied by a change in philosophy, and that affected *how* people conducted their business.

ADAM: Ok, give me an example.

ABBY: Not tonight! I need to get you all some supper and I don't want to miss any of the story. Let's take a break tonight. Dave gave me a weather update and this storm isn't moving out anytime soon – we can pick it up over breakfast.

BILL: I hate to end the storytelling – but maybe we can gather the other guests and expand the discussion. From what I know about the Renaissance the discussion could get pretty lively.

MINERVA: Sounds good to me – I'll brush up on my Western history overnight.

The stage lights dim...the fireplace gives a soft glow as the guests leave the Great room and move into the dining hall.

ACT TWO

The Second Epoch: The Renaissance through the Pre-Industrial Period

1300 – 1800 AD

Scene 1

The lights come up.

Minerva walks into the Great room with a cup in her hand. Next to her are Justin and

Linda. The three of them gather around a small table by the fireplace.

LINDA: Thanks for inviting us to join you this morning. Justin and I hung out in our room and read all day yesterday. Sorry we missed the storytelling.

JUSTIN: Yeah, but the down time felt good. I'm used to working hard and moving around all day. Carpentry work doesn't give me much time to sit around. Felt kinda good having a day to sleep in and take it easy.

MINERVA: I'm glad you joined us all for dinner last night. You dropped in on a lively discussion about the early days of civilization. Sorry if it was a little deep.

LINDA: Not at all. I was intrigued by the conversation and I'm looking forward to today's discussion – we're picking up at the Renaissance period, right?

MINERVA: Yes. And I hope you'll find my stories insightful.

(Enter Adam, Toni, and Mary Ann. Abby and David come in next carrying a teapot and a tray of bagels.)

ADAM: Hey Minerva!

MINERVA: Good morning Adam, hello everyone. Thanks for starting the fire Abby.

ABBY: No problem, I wanted us to get settled and get started as soon as you all were ready. There's a big pot of coffee in the kitchen if anybody wants a cup.

(Enter Bill and Irene, accompanied by Jake)

BILL: Good morning. You all met Jake last night. He decided to join us this morning.

I think his friends George and Ellen will be down a little later.

JAKE: Thanks. George has to make some calls this morning; he's self-employed and is worried about how things are going back in the office while he's snowed in up here. Ellen is waiting her turn for the phone so she can call her office, and then her sister to check on the kids.

DAVID: You're welcome, Jake. I think the two of us have a little catching up to do.

Abby was telling me about the conversation yesterday. Come on in and have a seat.

(Everyone grabs a bagel and takes a seat)

BILL: So, Minerva, where do we start this morning?

MINERVA: Well, let's ask Adam *(looks over to Adam)* – did you learn anything yesterday?

ADAM: Yup – I gotta read my history books more! *(Everyone laughs)*

MINERVA: Well then, I've accomplished a major feat! Shall we pick up our story at the beginning of the Renaissance?

IRENE: And don't forget to include a little history on literature.

MINERVA: Ok...*(tapping her chin)* where to begin...

The fifteenth century is generally accepted as the transitional period between the medieval and modern periods; but it might also be placed at the opening of the fourteenth century. It was in 1300 that Dante Alighieri (1265-1321) published his famous poem *The*

Divine Comedy. The *Comedy* is divided into three parts: Hell, Purgatory, and Heaven. In the poem Dante sees the spirits of Thomas Aquinas, Albertus Magnus, Peter Lombard, Solomon, Pseudo-Dionysius, Boethius, and others. All were the great theologians of the Middle Ages. In the poem their differences are resolved. His poem represents all the hope that a thousand years of the study of God could produce. He presented a vision of a universe structured by reason and unified by faith. The *Comedy* represents the bell that tolls to mark the beginning of a new era – a shift from the ancient to the modern.

Dante represented the beginning of a new type of author. Literature began to appear that was written in the vernacular, or language of everyday speech of the writer, rather than in Latin. This made literature accessible to more people and helped give each kingdom a separate identity. Dante wrote the *Comedy* in Italian. In England, Geoffrey Chaucer started writing the *Canterbury Tales* in 1386, continuing up until his death in 1400.

While men eagerly worked toward improving their minds, the physical world seemed to turn against them. Weather conditions worsened. Glacial activity in the late thirteenth to fourteenth centuries produced colder winters and reduced the growing season. Between 1315 and 1322 famine swept through Europe due to three consecutive years of failed harvest. Iceland, northern Norway, and other areas in the north ceased being able to produce their own grains. Fertile fields in the Swiss mountains were abandoned to the snow.

As if the troubles of the peasant population were not burdensome enough, a resurgence of fighting between France and England heaped more suffering on the residents of the French countryside. The two countries had their differences, but resisted

war throughout most of the thirteenth century. Marriages designed to bind the two nations together only served as means to increase the hostilities. In the fourteenth century old disagreements over the right to the French crown re-emerged with the death of the French king in 1328. King Edward III of England, a grandson of the French king, declared himself the king of France and ordered that all his holding in France be released from French sovereignty. The successor to the throne, Philip of Valois, who was only a nephew to the dead king, began to prepare for war.

War broke out in 1347 and continued with intermittent periods of peace through 1453. English naval superiority kept the island safe and the majority of the battles were fought on French soil. In the first half century of the war, the English conducted raids that decimated the peasantry, razing the French countryside and decimating crops (Cantor, 1993; Davies, 1996).

In 1348 the Black Death (bubonic plague) arrived in Europe via south Asian traders. Between 1348 and 1350 all of western Europe was affected. The death toll ranged as high as twenty-five to forty per cent in most areas. Over the course of the two years, it is estimated that as many as one-third of the European population (twenty-five million people) died of the plague. People in crowded towns with poor sanitation (and rats) were at greater risk than those in the countryside. People fled from the cities to seek refuge in the country. Many flourishing cities were left as virtual ghost towns. Of those who caught the plague, fewer than half survived. The clergy was not immune from the disease, losing as much as one-third of their ranks during the epidemic. The disease was noted by an outbreak of bloody, pus filled boils on the groin or armpit. Three or four days of intolerable pain typically preceded death. The dead and dying were left lying in the

streets, abandoned by frightened friends and family-members. Those who survived were haunted by ten-year cycles when the plague returned to claim the children born since the last epidemic.

Medieval medicine was incapable of either curing or identifying the cause of the disease. The devastating epidemic – coupled with the famine and the change in weather – caused people to panic. A strong belief took hold that God was punishing mankind for its sins. People lost faith in the Church's ability to save them. The clergy may have experienced even greater losses than the villages as a result of having tending to their congregations. Popular religiosity, however, increased. People felt that they had to placate God. In Germany a new religious sect, the Flagellants, wandered the countryside beating themselves with metal tipped whips. They believed that physical punishment would appease God. In some places lepers were harassed; in others Jews were charged with poisoning the water (Cantor, 1993; Farah & Karls, 1997; Gress, 1998).

In a September 1348 trial, the Jews at Chillon were charged with creating the plague; evidence of their guilt was gained through torture. The trial triggered a new set of pogroms targeting the Jews. In Basle, all Jews were rounded up, locked into wooden buildings and burned alive. These and similar scenes were repeated in Stuttgart, Ulm, Speyer, and Dresden. As many as 2,000 Jews were killed in Strasbourg and 12,000 in Mainz. The remnants of the Jewish population fled to Poland, henceforth the principal location of Jewish population in Europe (Davies, 1996).

The combination of famine and pestilence that decimated European population also changed the social standing of the peasant population. Prior to the plague, overpopulation led to poor wages and few options for the poor to improve their status.

Following the plague, nobles with vast landholdings were left without peasants to work the land. The peasants now had a basis of power. The fourteenth century ushered in a period of rebellion and peasant uprisings. By the end of the fifteenth century, there were few serfs left in western Europe. But freedom did not bring prosperity. Increased taxation to support the frequent wars was a burden to workers. The gap between the nobility, especially the royalty, and the peasants widened. As war became more expensive, the kings resorted to hiring mercenary bands. These bands sold their services to the highest bidder and would easily change sides. While unemployed, they lived off the countryside. A besieged noble or monastery possessed the means to pay a tribute to the mercenaries and send them on their way. The peasants, however, had no defense. The disorder wrought by the mercenaries made a strong argument for reestablishment of order and security under the protection of a monarch. The nobility, however, were by no means equipped to lead or to unite as a national power. Barons paid little attention to the details of administration and were too busy infighting for personal gain to succeed as a form of baronial government. Royal power was limited by the problem of heredity. A king who died without an heir left the kingdom in turmoil. Barons fought to control the crown. Regardless of the problems inherent in the system, the concept of the crown was a firmly established part of French and English government. Western Europe was destined to several more centuries of instability before national government systems would emerge (Cantor, 1993; Gress, 1998).

In the midst of this era of war and pestilence began the period known as the Renaissance. The crises of the fourteenth and fifteenth centuries didn't deter the intellectuals and artists of western Europe from pursuing their studies and creativity. In

fact, the pessimism of the times may have made them contemplate more deeply about the nature of God, the universe, mankind, and society. Learning of all types accelerated. More masterpieces were created during the period between 1270 to 1500 than in any other period of human history, which is why it has been so aptly dubbed the Renaissance period.

14th-15th century Northern Europe

During the thirteenth century the University of Paris dominated the learned world. By the end of the century, Oxford rose in stature and many scholars traveled between the two universities. By 1320 Oxford took over as the dominant center for European scholasticism and a center of European philosophy. The typical student entering Oxford at age fourteen could expect to spend the next twelve years in study. Like Paris, Oxford became embroiled in the debate between Augustinian theologians and Aristotelian philosophers. In 1277 the congregation of Oxford University, led by Dominican Archbishop Robert Kilwardby, condemned thirty theses on grammar, logic, and natural philosophy. Among these were the corollaries written on Aquinas' teaching, that within each human being was a single entity, the intellectual soul. Theologians opposed Aquinas' views because, in their opinion, it violated their Platonic views of plurality of forms. Shortly after the decree, Archbishop Robert Kilwardby was summoned to Rome as a cardinal and an even more zealous Archbishop, John Peckham, was appointed. Peckham, a Franciscan, took it upon himself to persecute those who supported Aquinas on this issue. For some time following his appointment, Oxford was dominated by Franciscan thinkers who, although acquainted with the works of Aristotle, were opposed

to the unique perspective taught by Aquinas. One of the most distinguished of these was John Duns Scotus (1265-1308) (Kenny, 1998; Van Doren; 1991).

Duns Scotus opposed Aquinas on almost every point of philosophy. The two interpreted Aristotle's description of *being* in two different ways. Aquinas talked of *being* as separate for each kind of thing; for animals *being* was the same as to be alive. Among living things there were therefore as many different types of *being* as there were types of life. Scotus, on the other hand, interpreted *Being* in terms of a broader scope; it included the infinite Christian God. According to Duns Scotus, for something to *be* it had to have something that created it and was therefore part of *Being*. For Duns Scotus *Being* was not something that was carved into an infinite number of smaller parts, it included the Infinite.

Both Duns Scotus and Aquinas provided logic by which to prove the existence of God. Both used proofs that were based on the concept of causality. Where they differ is that Aquinas began his proofs from the existence of causal sequences in the world; Duns Scotus began his proofs with the possibility of causation. Duns Scotus preferred his proof because it was not based on facts of nature, but purely on abstract possibilities. He argued that if you start with mere physics you never get beyond the physical universe and your argument is destroyed if you get your physics wrong (which Aquinas did in his examples of motion) (Kenny, 1998).

Creatures of the world, according to Duns Scotus, possessed two forms; one of humanity and an individuating form he referred to as *haecceitas (thisness)*, each dependent on the other, distinct yet united. According to Aquinas, two humans were distinct from one another not because of their form, but because of their matter.

Duns Scotus also argued that God is free, and therefore is not subject to human reason; in fact, human reason limits the possibilities of God. Therefore, since God cannot be circumscribed in any way, least of all the human mind, then human reason cannot hope to determine and understand God. Aquinas made a distinction between the truths of God that can only be known through faith (such as the nature of the Trinity) and other truths knowable through reason (such as omnipotence, omnipresence, etc). Scotus argued that a Christian 'knows' through revelation and that all things of God were restricted from the purview of philosophers and belong to the domain of theology.

Within theology, Duns Scotus is best known for developing the belief in the Immaculate Conception. The belief did not define Mary as a virgin at birth, although that was taught; it involved the belief that Mary herself was free from the taint of original sin. This doctrine is important in the history of philosophy because with it Duns Scotus defined the point of entry of the soul as the moment of conception. Aquinas, following Aristotle's lead, believed that the intellectual soul did not enter during the first few weeks of the life of the fetus. The views of Duns Scotus were later adopted by the Catholic Church and are part of the current debate about abortion (Kenny, 1998; Van Doren, 1991).

Scotus' tendency to restrict the field of philosophy was supported and carried further by his successor, William Ockham (1285-1349). Ockham was also a Franciscan friar and studied at Oxford shortly after the departure of Duns Scotus in 1301. Much of Ockham's philosophy of logic and metaphysics are the result of either developing or opposing the positions of Duns Scotus. Ockham supported Duns Scotus' conception of *Being* as a term that incorporates God in the same sense as creatures. He also agreed with

him on the distinction between abstractive and intuitive knowledge, adding the concept that God can make us have intuitive knowledge of an object that does not exist. If God can make the human eye see a white wall, then God can make a person have the same belief without there being a white wall there at all.

Ockham disagreed with Duns Scotus about the nature of universals. He rejected the concept of a common nature in objects we call by a common name. No universal exists outside the human mind; it is simply a construction made up for the purpose of categorization. He opposed the idea of universals on theological grounds. If universals existed, then Christ shared something in common with Judas, which was inconceivable in his mind.

Ockham's views on universals became known as nominalism. Ockham thought of the concepts in our mind as forming a language system, common to all humans regardless of spoken language. To Ockham, universals have no existence whatever and are only names, symbols in the mind used for categorization and representation. Nature consists of only things and human reason only permits man to encounter them. No deductions made from the encounters are valid; especially encounters with the divine; therefore, faith and reason have nothing in common. Each has its own truth – with faith, which brings salvation, being the more important of the two (Kenny, 1998; Van Doren; 1991).

In 1319 Ockham left Oxford over difference with the Chancellor John Lutterell. He went to London where he wrote up his Oxford lectures, a treatise on logic, and commentaries on Aristotle and Porphyry. In 1324 he was summoned to Avignon to answer on charges of heresy filed by Lutterell. He was not condemned for heresy, but during his time in Avignon he became unpopular with Pope John XXII over

controversies that were raging between the pope and the Franciscan Order. Ockham attacked the temporal power of the papacy and demanded the apostolic poverty of the church. Ockham and the head of the Order, Michael of Cesena, fled Avignon and took asylum in Germany under the protection of Emperor Ludwig of Bavaria. At the time the emperor was involved in conflict with the papacy over two major issues, the power of the emperor to appoint bishops, and taxation of the clergy for secular purposes. Ockham became embroiled in a third struggle between the church and state. Ockham took up his pen in defense of the emperor and wrote pamphlets that outlined a political theory of natural rights. In his *Dialogues*, Ockham stated that the emperor derives his power from the people via election and not through appointment by the pope. What goes therefore for the emperor, goes for other temporal sovereigns. The right to choose one's rulers is a natural right of human beings. He advocated for control of papal power through general councils, which would resemble the representative assembly of a parliamentary democracy (Kenny, 1998).

In the realm of science, Ockham left a legacy that set the stage for the scientific revolution of the sixteenth century. His preference for the specific over the general set a framework for the development of a modern view of the investigation of nature.

Expanding on the theories of his Oxford predecessors, Robert Grosseteste and Roger Bacon, Ockham adopted their scientific method. Grosseteste and Bacon stressed the importance of sensory perception, and therefore observation and experimentation, as a means to explain the physical world. Ockham, like many other fourteenth century scholars, devoted himself to pointing out and attempting to correct the inaccuracies in Aristotelian physics. Aristotle attributed general cause as that which is inherent in an

object. Motion, for example, is part of the nature of an object. In the hierarchy of the universe every object and element seeks its natural place. Ockham held that the only valid source of knowledge about the world is what is observable. Therefore, motion, which is not observable, and therefore cannot exist; it is simply the term used to describe the dislocation of an object from one place to another. Ockham, in effect, shattered the concept of the Aristotelian universe. He broke one paradigm, but lacked the knowledge and quantification methods required to create a new paradigm. It would be three centuries before Galileo, Copernicus, and Newton would devise a new system (Cantor, 1993).

Following Ockham's departure from Oxford, a group of independent thinkers began to develop new curricula. Many scholars published treatise on propositions about motion and change, expansion and contraction, measurement and time. Logic was formalized and applied to theology. Following the lead of Greek scholars, mathematics was applied to questions of theology. It is debatable whether or not these inquiries assisted in the progress of theology, but they became valuable in the study of physics. Merton College, part of Oxford, developed a new mathematical physics. The scholars who pursued these studies were referred to as Oxford 'calculators'. The method of inquiry involved presenting and solving of *sophismata*, logical paradoxes and puzzles. In the course of resolving these *sophismata*, mathematical ratios and proportions evolved. The new notions were diagrammed, which proved useful in measuring the interaction of motion, time, and distance, laying the foundation for the revolution in physics in the sixteenth century.

One of the foremost Oxford calculators was Thomas Bradwardine (d. 1349), who developed a theory of ratio he used to demonstrate his theory of how forces, resistances,

and velocity correlated, superceding Aristotle's concept of motion. His theories were adopted in Oxford and at the University of Paris. He also introduced a new era at Oxford by reintroducing the works of St. Augustine. Bradwardine presented an Augustinian treatise on the subject of predestination and freedom. His work represents a shift in theology from a focus on Christ and the Trinity to a focus on the individual merits of grace and freedom and the limits of omnipotence (Kenny, 1998).

One of the most significant figures in the Augustinian revival was John Wycliffe (c.1330-1384). Wycliffe was a scholar whose abilities put him on par with Duns Scotus and Ockham. He claimed that the Bible was the sole authority for religious truth and began to translate it from Latin into English so people could read it themselves. Between 1360 and 1372 Wycliffe produced his philosophical writings, which are incorporated in his *Summa de Ente*, including a treatise on universals. Wycliffe, as a realist, argued for the existence of universals. He claimed that all the sin in the world is caused by emotional and intellectual error about universals. Nominalism, he argued, leads to self-interest over the interests of humanity. From this, he later produced a fully developed theory of communism.

In 1374 Wycliffe was invited to take service with the king of England. The king was involved in a conflict with the church. He asked Wycliffe to answer the question as to the right of the state to tax the clergy. Wycliffe's written response, in his book *On Civil Dominion*, criticized the wealth of the church, accused the clergy of corruption, challenged the pope's claim to absolute authority, and advocated the state's right to seize the property of all corrupt clergy. He claimed that a man in sin had no right to own

property, and a man in a state of grace possesses all the goods of the universe. He claimed the Bible (not the pope) was the sole authority on religious truths.

As strange as it seems for the times, Wycliffe's writings on dominion did not seem to cause him trouble initially. The king of England used his arguments to support the confiscation of clergy property. It is likely that Wycliffe was temporarily ignored due to a schism in the church between two rival popes, one appointed by the French and one by the Italian clergy.

What brought persecution was his attack on the Eucharist. While many of the clergy and laity supported the views expressed in *Dominion*, they were not prepared to support his attack on the doctrine of transubstantiation. Those who became his supporters became known as Lollards; they angered the public as they destroyed images of saints, ridiculed the Mass, and ate communion bread with onions in a show of defiance. Finding him devoid of political support, the University of Oxford expelled him and banned his doctrines. His followers continued to spread his teachings by preaching and promoting reading of the Bible. They advocated a faith built on personal experience apart from the church. The Lollard movement helped to inspire the English Peasant's revolt of 1381 (Davies, 1991; Farah & Karls, 1997; Kenny, 1998).

According to historian John Froissart (1337-1404), the commoners of England began to begrudge their position. The source of their discontent were the precepts taught by a preacher, John Ball, that all men are the children of Adam and Eve, and therefore equal. The commoners moved to revolt. Peasants from Kent, Essex, Sussex, Bedford, and adjoining counties marched to London. Upon reaching the city, their numbers were upwards of 60,000. The peasants demanded a meeting with the young king Richard,

which was granted. The king agreed to their demands, which included the abolition of serfdom, a decrease in poll tax, and amnesty for participation in the revolt. The king agreed to the demands. However, as the leader of the peasants, Wat Tyler, was leaving the palace, he was killed. Government forces killed many of the peasants and the rest returned home. The only promise the king kept was the removal of the poll tax (Froissart, 1972).

Wycliffe died in exile at Lutterworth in 1384. In 1415 the Council at Constance secured the election of a single pope, repairing schism in the church. Simultaneously the Church addressed the problem of Wycliffe's doctrines. Wycliffe was burned as a heretic posthumously and the Church condemned his teachings, which by that time had spread to Bohemia with dramatic political effects. The works of Wycliffe were disregarded by later generations. Protestants were repelled by his scholasticism; Catholics preferred a philosophy more amenable to their aims (Davies, 1991; Farah & Karls, 1997; Kenny, 1998).

The doctrines of Wycliffe were adopted in Bohemia by Jan Hus, a popular preacher and professor at the University of Prague. By the early 1400s the Slavs of Bohemia, known as Czechs, began to develop their own national identity. They wanted to end German control of their country and advocated reform of the Catholic Church, which had many German clergy. Jan Hus became a leader in the reform movement. A violent wave of riots erupted across Bohemia when the Church and political leaders condemned Hus and his works. Faced with full-scale rebellion, the Council at Constance summoned Hus to answer the charges of heresy leveled against him. The Holy Roman Emperor of Germany guaranteed safe passage to Constance, Germany. The guarantee was ignored.

Hus was burned at the stake as a heretic. The Czech population adopted him as a martyr to their cause.

Between 1420 and 1436 Hus' supporters, called Hussites, continued to resist the church and the German emperor. The Church launched five crusades against them. The Hussites were able to beat the crusading knights each time. In 1436 the Church and emperor sent a representative to the Hussites to negotiate. An agreement was made giving the Hussites certain religious liberties in exchange for their allegiance to the Church. While this gave an outward appearance that the Church had successfully met the challenge to its authority, it did not stop the spread of spiritual doctrines taught by Hus and Wycliffe. In addition, political and linguistic changes began to impact the scholastic achievements in northern Europe (Farah & Karls, 1997; Kenny, 1998).

In the period between the twelfth and fourteenth centuries, the Universities at Paris and Oxford were international universities. The language in common to both was Latin. Scholars could travel easily between the two, exchanging academic communication in a common language. By the end of the fourteenth century, this began to change. Vernacular literature developed in all the countries of Europe. Although Latin remained the language of academia, it was no longer the language used in the most vigorous exchanges of thought. In Oxford, Wycliffe's colleagues began to write and preach in English. Dante wrote *The Divine Comedy* in Italian; Geoffrey Chaucer wrote *The Canterbury Tales* in English. In addition, the Hundred Years' War between England and France isolated the two universities, each going their own way.

Vernacular literature was written that either romanticized life, or revealed the corruption in the church. London cleric William Langdon wrote a scathing poem titled

Pier Plowman, directed at all four Orders of Friars. In this long and bitter criticism of the clergy, Langdon accuses the Friars of greed and of interpreting Scripture to suit themselves, including trafficking in Masses as a means to improve their wealth. He accused the people of ignorance for believing that the Friars could absolve them of their broken vows (Cantor, 1993).

Offsetting this pessimism was a body of literature that cultivated the old traditions of romantic chivalry, of knighthood, and of life in the aristocratic court. Court life in the fifteenth century became a panorama of titles, clothing, cuisine, and tournaments. The pageantry of the aristocratic lifestyle was the distinguishing trait between nobility and the wealthy merchants. Large sums of money were spent to maintain the lifestyle. The affluent and educated gentry, merchants, and clergy all participated in the culture. There was a resurgence of popularity for Arthurian literature, allowing ordinary people to read about royalty even if they did not have the economic means to participate in the lifestyle (Cantor, 1993).

Political changes accompanied the linguistic ones. The power of the papacy declined during the Great Schism. The power and influence of the Holy Roman Emperor was diminished to the point that he was effectively only the emperor of Germany and Austria. By the end of the fifteenth century Europe was divided between monarchies in England, Spain, France, and Germany. Italy was divided between the north and south. Northern Italy was divided into city-states; in Central Italy the popes re-established their place in Rome and focused on the issues close to home. As Northern Europe turned its vision inward, the Renaissance began to bloom in Italy (Kenny, 1998).

ACT TWO

Scene 2

DAVID: So it was an increase in literature in common language that set up the changes that brought on the period we now call the Reanaissance?

MINERVA: That's right, David. We can't underestimate the power of the written word. It has a powerful ability to spread information and affect the way people think.

ADAM: I finally get it!

MINERVA: Get what, Adam?

ADAM: A question one of my profs asked once. He asked us if education was dangerous. The class laughed. We had a discussion then about the difference between training and education. We're all going to be looking for jobs when we get done, so we were hot that college doesn't seem to do a good enough job training us for work. I mean – what am I going to do with a liberal arts degree?

MINERVA: So – you have changed your mind?

ADAM: Well, maybe not completely – but education is what triggered the change in society after centuries of no changes. Reading about things is education, not training.

MINERVA: Quite right. Although the amount of information available was limited, the ability to share it in vernacular languages in written form rather than in Latin made a tremendous difference in people's perspective of the world.

IRENE: It's interesting that intellectual activities and the arts were so actively pursued

during all the plagues and hard economic times. I always thought people didn't tend to pursue that kind of activity unless their basic needs were met. Wasn't it Maslow or someone like that who made up a hierarchy of needs?

MINERVA: Interesting observation, Irene. And yes, it was Abraham Maslow in the twentieth century who created a hierarchy of needs – if this storm lasts long enough we might even get a chance to talk about his system.

BILL: Good call, Irene. You know, I guess I would have to challenge Maslow's hierarchy as well – the Christian church always seems to flourish intellectually during time of persecution and get apathetic during times of comfort. (*looking deep in thought*) I'll have to think on this one.

MARY ANN: Well, I was shocked to find out that the basic philosophy that divides the pro-life and pro-choice camps dates back all the way to Thomas Aquinas and Duns Scotus. Who would 'a thought?

TONI: I teach high school history and social studies and I didn't know that either. Guess I had better brush up on philosophy if I am going to try to explain the underlying causes of conflict.

JUSTIN: Minerva – you said that Wycliffe rebelled against the church. What was up with that?

MINERVA: Prior to the Protestant Reformation, the Church was the major authority for all action in the world, including the appointment of kings. With Wycliffe's interpretation of the Bible into English, people began to question Church interpretations. The people rebelled when they figured out that God created men as equals. The Church supported the feudal system with all its caste system for

years. Just as the Church held authority based on their control of the Bible, the Bible was used as authority to defy the Church once people could read it on their own.

LINDA: It is amazing that people were so blindly led.

MINERVA: Really? Don't you think that happens today?

LINDA: No...I think we have access to a lot of information today – I mean, how do you hide anything with the internet and newspapers today?

MINERVA: Then why do we have conflict over different accounts of the same incident?

LINDA: How so?

MINERVA: Take any account of political action in the news today. Each news story has its own twist on the details. The facts may be the same, but the interpretation varies.

People disagree over U.S. involvement in the war in Iraq. Why?

LINDA: I guess because they have different beliefs about what is right.

MINERVA: Exactly – that is why understanding the basis of your own personal philosophy is important and why each of us should develop more critical thinking skills. Otherwise we are happy to follow blindly any one who espouses the same set of beliefs we think we hold.

ADAM: Whew...deep stuff. Now I feel a little guilty for jumping on the bandwagon during some of the get togethers at school. I just wanted to fit in and they all sounded ok.

BILL: That's the challenge I have when I deliver a sermon – I get a lot of head nodding,

but I'm not sure people are really thinking for themselves. In fact I know they're not because all the beliefs they claim to adhere to are gone come Monday morning.

JUSTIN: Religion is important – but come on man, you only live once. If you followed all the rules they give you in church you might as well die now cause life would be real boring! I'm a Christian and all that, but why does it matter whether I follow a religion or do my own thing? I mean life's short and you gotta enjoy what you can, ya know, long as it's legal and all.

MINERVA: Interesting comment, Justin – sounds like the reaction people had to the plague.

JUSTIN: Really?

MINERVA: Yes...The Church wasn't able to spare them suffering and many turned to 'their own thing'. As I tell you about it, think about whether people reacted to the authority of the church or to faith itself...

The Italian Renaissance (1350-1600)

Italy managed to escape the economic problems of the rest of western Europe, but not the plague. The Black Death hit Italy first in 1347. The first deaths were in the port city of Messina, Sicily. Half of the population of Messina was wiped out. The epidemic spread across Sicily, crossed the straits into Italy and moved up the peninsula. By 1348 the prosperous towns of northern Italy were hit, as well as North Africa.

Paradoxically, the Black Death did not create a vast body of theological and moral literature exploring the meaning of the disaster. Instead, the plague seemed to stir a

hedonistic response, increasing the propensity of colorful clothing and behavior throughout Europe. The plague also created movement as people fled disease stricken areas. Following the epidemic a steady stream of Greek scholars relocated from Byzantium to northern Italy.

Over a third of the population of Europe was killed by the disease, creating an abundance of wealth for the survivors and all of the accoutrements that go with it, including clothes, bedding, and other cloth articles. Across Europe hundreds of millions of articles of cloth were discarded. Toward the end of the fourteenth century a new use was discovered for the discarded cloth – the manufacture of rag paper. Rag paper was preferable to parchment or vellum and was used for many purposes, including the production of literature (Van Doren, 1991).

The Renaissance period was in many ways a continuation of the Middle Ages, but it also signaled the beginning of modern times. Educated Europeans began to develop new attitudes about themselves and the world. The period was marked by the development of humanism (as it was later named), both in the sense of a concern with the human race, and also as an interest in “humane letters.” More specifically, there was an interest in pagan Latin authors over Christian Latin authors and the reading of Greek authorities in the original rather than in translations. The influx of Byzantine Greek scholars enabled Europeans to rediscover the classics in their original form.

There were several noted Italian Renaissance writers, two who played a significant role in the opening of the Renaissance period – Francesco Petrarch (1304-1374) and Giovanni Boccaccio (1313-1375). Petrarch was a noted scholar. In 1341 he was crowned a poet laureate in Rome, afterward placing his laurel crown on the tomb of

the Apostle St. Peter in the St. Peter's Basilica. He considered himself a Roman reborn, while still maintaining his Christianity. Petrarch's most noted literary achievement were the 366 sonnets he wrote expressing his love for a woman, named Laura, who died during the Black Death.

A friend and contemporary of Petrarch was Giovanni Boccaccio who wrote all his major works in Italian, including the *Decameron*, which was a series of stories told by a group of young men and women who had gone to the hills outside of Florence to escape the plague. As emissaries for the pope, Petrarch and Boccaccio had occasion, and the funds, to travel across Europe in search of lost Latin translations of the classics. Searching through archives and ancient books, Petrarch discovered a number of Cicero's letters that had supposedly been lost forever. Boccaccio studied classical Greek, and with the help of another scholar, made rough translations of the *Iliad* and *Odyssey* into Latin. The two scholars pressed their ideas about a revived Roman world on all who would listen, including the popes (Farah & Karls, 1997; Van Doren, 1991).

Following the lead of Petrarch and Boccaccio, the humanist movement moved rapidly among educated Italians who hungered for the secular, practical ethic they found in the classics. In an active republican form modeled on Cicero, the political elites championed civic humanism that governed Florence, and later the Venetian republics. The culture of Italy was conducive to the development of the Renaissance. Town life was stronger in Italy than in northern Europe. Italy did not adopt feudalism and other medieval institutions that originated in the north. Wealthy Italian communities resisted the efforts of emperors, kings, and nobles to control them. Through the Middle Ages they defeated several attempts by the Holy Roman Emperors of Germany to gather them into

the empire. They became independent city-states, each with a walled city and surrounding countryside. The upper bourgeoisie of the Italian city-states placed a great emphasis on human autonomy (Farah & Karls, 1997; Stipp, Dirrim, & Hollister, 1972).

Wealthy Italians were educated, involved in an active court life, and took pride in their cities, which inspired a civic patriotism with a belief that all urban resources should be used to fortify and beautify their cities. Roman architecture and links to ancient Roman culture were prevalent. Humanism displayed itself in art form as an expression of the new emphasis on the individual and the world. Realistic portrayals of the lives and acts of ordinary people began to appear. Paintings were dimensional, emphasizing realism, naturalness, and verisimilitude. Previous art was Byzantine in style, with stylized faces and forms and obvious religious symbolism. The new art presented a radically different view of the position and role of human beings in the universe. During the Middle Ages the world focused on God. The Renaissance signaled a shift back to the art forms and perspectives of the Greek and Roman cultures (Cantor, 1993; Van Doren, 1991).

Humanists believed that the ancients had established the highest level of achievement in history, poetry, art, moral philosophy, grammar, medicine, agriculture, and law. The humanist saw his role as one that took the ancient texts and studied them using methodical analysis and interpretation in order to apply their lessons to his own age. They believed human reason and liberty were legitimate sources of judgement. In effect, they defied the wisdom of the Middle Ages that folded the individual into the universal (Platonism) and instead adopted the new individualism (Gress, 1998; Farah & Karls, 1997; Kenny 1998).

As humanists came to admire classical culture, they also adopted many Greek and Roman beliefs. The idea of seeking fulfillment in daily life was more appealing than the medieval Augustinian belief that people should expect little comfort from life on earth. They also embraced the Greco-Roman belief that each individual has dignity and worth. The concept of the Renaissance man, as described by Aristotle was adopted (Farah & Karls, 1997).

In the beginning of his treatise *On the Parts of Animals*, Aristotle comments on the nature of an educated man – his statement is simple, yet eloquent:

Every systematic science, the humblest and the noblest alike, seems to admit of two distinct kinds of proficiency; one of which may be properly called scientific knowledge of the subject, while the other is a kind of educational acquaintance with it. For an educated man should be able to form a fair off-hand judgment as to the goodness or badness of the method used by a professor in his exposition. To be educated is in fact to be able to do this; and even the man of universal education we deem to be such in virtue of his having this ability. It will, however, of course, be understood that we only ascribe universal education to one who in his own individual person is thus critical in all or nearly all branches of knowledge, and not to one who has a like ability merely in some special subject. For it is possible for a man to have this competence in some one branch of knowledge without having it all. Aristotle (as cited in Van Doren, 1991, p. 135)

‘Scientific knowledge’ as described by Aristotle is the type that includes the general principles and specific details about a field of study. For a man or woman to have ‘educational acquaintance’ implies an understanding of the methods employed within a subject. Such a person is ‘critical’ in that field and can tell the difference between sense and nonsense. An individual with ‘universal education’ is therefore one who is ‘critical’ in all fields of knowledge. It was to this goal that the humanists of the Renaissance aspired (Van Doren, 1991).

Leonardo da Vinci (1452-1519) was the epitome of the Renaissance man. Born in Vinci, a small town near Florence, he was apprenticed to the painters Verrocchio and Antonio Pollaiuolo. In addition to skill at painting, Leonardo possessed a kind of universal genius. He dabbled in almost every type of learning. He left thousands of written and illustrated pages of his genius. To his patrons he offered his skills as a painter, as a constructor of siege machines, and inventions. His notebooks contain everything from techniques on painting and architecture to speculations on anatomy, biology, and aeronautics. Despite his seventy years, almost every item on his long list of projects remained unfinished. His genius and creativity led him to pursue all areas of knowledge. It may be that Leonardo realized that to stop and become an expert in one area, which may have been required in order for him to create his conceptions, would have slowed him down. His goal may not have been expert knowledge in one science, but to have an 'educational acquaintance' in all areas.

To help others gain fulfillment and achieve the Greek ideal of education, the humanists created school subjects related to the humanities, including history, philosophy, Latin, and Greek. Clergy were quickly replaced as teachers as the demand for education grew. Despite this, most humanists applied their learning and philosophy to the study of Scripture as well as the classics. Most Italian humanists were Christians who maintained an allegiance with the Church. Many of them aimed at a type of Christian Platonism, emphasizing an individual and personal relationship with God. Humanists were, however, against fictitious claims, which they sought to destroy through rational criticism, and to replace such claims with better defenses for a purified church.

Humanists sought out and studied ancient and medieval texts. When manuscripts were located they were often in poor condition, forcing classical scholars to collect and collate large numbers of manuscripts in order to compile and create as complete a text as possible. As a result, many humanist scholars became expert philologists, studying and comparing the linguistics within texts. The study of early manuscripts was often revealing. The earliest and one of the most spectacular examples of this was the *Discourse on the Forgery of the Alleged Donation of Constantine* written by Lorenzo Valla (c.1406-1457) (Cantor, 1993; Gay & Wexler, 1972; Gress, 1998; Kenny, 1998).

Valla wrote the *Donation of Constantine* in 1433 while employed and under the protection of King Alfonso of Naples, who was a political enemy of the pope. Valla sought refuge with the king after disputes with other scholars that angered the church. In his *Dialogues on Pleasure* (1431) Valla suggested that the Epicurean pursuit of pleasure was just as virtuous as the monastic vows of Christian friars. Protection afforded by King Alfonso allowed Valla to continue his study of ancient manuscripts and escape punishment by the church.

Pope Eugenius IV and King Alfonso were fighting over rival claims to the kingdom of Naples at the time Valla wrote his discourse. Valla's *Discourse on the Donation of Constantine* was revolutionary and one of the most devastating pieces of scholarly work yet written. His method of study became the cornerstone of the modern critical method. Before the time of Valla, authentic meant 'confirmed by indisputable authority'. Valla changed it to 'verified by critical method'. The basic principle employed was the comparison between authentic and secondary, derived, or forged information. Valla's definition of authentic information was the account of an eyewitness or

contemporary sources. If a text could be proven not to be authentic, it was then secondary, and if secondary it was open to discovery as to the credibility of the source.

Using textual criticism, Valla demonstrated that the *Donation of Constantine* was a forgery. According to the *Donation*, in the fourth century Constantine the Great, the first Christian emperor of Rome, gave the bishop of Rome, Pope Sylvester I, the imperial Lateran Palace in Rome, all the imperial insignia, the rest of the Roman Empire in the West, and also granted all Christian clergy a privileged status in the Empire. The *Donation* established forever the supremacy of the Roman See. From the ninth to fifteenth century it was believed that Constantine abdicated power to the church because of his conversions to Christianity. Popes throughout the centuries claimed the authenticity of the *Donation*, which provided them the right to claim Rome and supremacy over all rulers in western Europe, even the Roman emperor. According to the *Donation*, the emperor owes his crown to the pope, and could therefore be deposed by papal decree. Valla's evidence against the document was clearly stated, despite his biting sarcasm. He revealed the inconsistencies in language, the anachronism, barbarisms, and errors to demonstrate that the document was written centuries after it was to have supposedly been created. He repeatedly ridiculed and condemned the author for his inept ability to create the forgery

For the present, however, let us talk to this sycophant about barbarisms of speech; for by the stupidity of his language his monstrous impudence is made clear, and his lie (p.8)...Does not this fable-fabricator seem to blunder, not through imprudence, but deliberately and of set purpose, and so as to offer handles for catching him? ...I find no words, no words merciless enough with which to stab this most abandoned scoundrel; so full of insanity are all the words he vomits forth...you did not know history. And I give thanks to God on this very score, that he did not permit this utterly vicious scheme to be suggested save to an exceedingly stupid man (Valla, 1972, p.15)

The rage of the ecclesiastical officials did not deter Valla from publishing the conclusions he derived from his study of the textual evidence. Only King Alphonso's protection and a timely exodus from Italy saved Valla from Inquisitors. Undaunted, Valla continued unveiling sacred documents that cast doubt on the authenticity of the Apostle's Creed. He also labeled Augustine a heretic for his views on predestination. In the 1440s he wrote one of his most interesting philosophical works on the concept of Free-Will (Cantor, 1993; Gay & Wexler, 1972; Gress, 1998; Kenny; 1998).

In his dialogue on Free-Will, Valla started with a familiar philosophic problem. 'If God foresees that Judas will be a traitor, it is impossible for him not to become a traitor.' This he holds will be true unless God lacks providence. Using the philosophic technique of dialogue, Valla followed a set of moves and counter-moves. In order to protect himself from charges of blasphemy, Valla introduced two pagan gods, Apollo and Jupiter, as a means to separate the attributes of omniscient wisdom and irresistible will, which in Christian theology are inseparable attributes of God. If man has no freedom, it is not because of divine knowledge, but because of divine will.

Rather than offer a philosophical reconciliation between divine providence and divine will, Valla turned to the Bible, quoting Paul in his Epistle to the Romans about the predestination of Jacob. This is a shocking change of position coming from a humanist who advocated human independence and free will, a reversal of one of his earlier works in which he condemned Augustine for coming to the same conclusion. Staying true to his art, Valla used the authentic source found in the letters of Paul rather than relying on 'indisputable authority'. The dialogue ended with a denunciation of all philosophers, including Aristotle!

The next challenge to Church authority came through a new invention. The invention of the printing press in 1450 by James Gutenberg created an explosion in the rate of knowledge dissemination. The first books were printed on rag paper, the abundance of which kept the price low and made the cost of printing affordable. Great discoveries were made prior to the printing press with only minimal impact on daily life. The printing press changed the nature of daily life. For the first time, common people were introduced to new ideas, new worlds, new discoveries, and new inventions. Even non-literate people were affected. Traveling entertainers read from printed books as a means of making a living. Gutenberg's inventions soon reached Italy. By 1501 there were a thousand printing shops in Europe producing an average of 35,000 different titles with a distribution of twenty million copies. Nearly every important Greek and Roman work was printed and distributed throughout the learned world. Printed books allowed the sharing of ideas that sparked a surge of scientific thought and discovery. Leonardo daVinci's contributions to the fields of art, anatomy, physiology, mechanics, hydraulics, physics, philosophy, mathematics, writing, engineering, philosophy, orbital mechanics, botany, and optics may well have been prompted by the stimulation of thought as a result of the printing press. The printed works of Italian humanists made their way into northern Europe, fomenting a northern Renaissance (Van Doren, 1991).

In 1464 printed copies of Valla's dialogue on Free-Will stimulated a debate between faculty and students at the University of Louvain in northern Europe. A member of the Arts faculty, Peter de Rivo, was asked by students to discuss whether or not St. Peter had it in his power not to deny Christ three times after Christ had said that he would. De Rivo relied on Aristotle and answered that he did. The argument that a future-

tensed proposition about a particular event is either true or false results in fatalism. De Rivo rejected fatalism and used Aristotle's third value – since future events are not yet determined, statements about such are not yet true or false, though they will be later. In other words, Peter *did* hold the power to acknowledge his relationship with Christ and that it was through omniscience that Christ was able to make the statement that he would deny him; not through pre-determination.

Peter de Rivo's theological colleague, Henry van Zomerén, took exception with de Rivo's introduction of a third truth-value. Van Zomerén pointed out that Scripture was filled with prophecy and that the idea that these were mere possibilities made the prophets out to be liars. De Rivo countered that statement and claimed that to deny the possibility of a third truth-value was to fall into determinism, which was one of the doctrines of Wycliffe that the Council of Constance condemned as a heresy. Van Zomerén decided to appeal to Greek Cardinal Bessarion. Bessarion in turn contacted a Franciscan, Francesco della Rovere, who concluded that the acceptance of a third truth-value was a heresy for denying future-tensed articles of the Creed. It is interesting to note that Louvain was a secular university and that stress was laid on free-will, not on divine power. Secondly, the Franciscan Francesco della Rovere was later elected as Pope Sixtus in 1471. Within five years the bull *Ad Christi Vicarii* condemned five of de Rivo's propositions, three of which dealt with his proofs based on Scripture for his three-valued system of logic (Kenny, 1998).

Cardinal Bessarion was no stranger to Aristotle, having produced a new Latin translation of Aristotle's *Metaphysics*. He was, however, involved in another controversy about the relationship between Aristotle and Christian teaching. Greek scholars at the

papal court were beginning to translate the works of Plato into Latin. A debate arose as to whether Plato was inferior to Aristotle. Bessarion's written response pointed out that while the two philosophers did not agree on all points with Christian doctrine, that Plato held at least as much in common with Christian doctrine as Aristotle.

Concurrently, a revival of Platonism was taking place in Florence. The head of the wealthy Medici family ordered his court philosopher, Marsilio Ficino, to translate the entire works of Plato. Ficino gathered a group of wealthy students to study Plato, referring to them as his 'Academy'. His most notorious student was Giovanni Pico della Mirandola (1463-1494). Pico received a humanistic education at home and studied Aristotelian philosophy at Padua, and canon law at Bologna. He was learned in Arabic, Aramaic, Greek, and Hebrew and held a fascination for the magical elements found in the Jewish mystical Kabbala and the Greek texts of Hermes Trismegistos (a collection of ancient alchemy and astrological writings recently translated by Ficino).

Although Pico opposed the pseudo-science of astrology, he was a firm supporter of alchemy and symbolic rituals, believing they could give legitimate magical power. He was the first to use Kabalistic doctrine to support Christian theology. By the time Pico was twenty-three, he considered himself equal in learning to any man alive. To prove his ability, he proposed to defend a list of nine hundred theses drawn from various Greek, Latin, Hebrew, and Arabic authors. He challenged scholars from all over Europe to come to Rome to dispute the topics with him publicly. Pico's list came to the attention of the Pope. Thirteen of the theses were declared heretical. Pico immediately recanted, but was still imprisoned. After his release Pico settled in Florence, later publishing a treatise titled *On the Dignity of Man*, an extended commentary on Protagorean text, in which he

implied that man is the spiritual center of the universe. In 1492 he became a devoted follower of a reforming friar named Savonarola and was absolved of heresy, living piously until his death in 1494. His final work was *De Ente et Uno*, a reconciliation of Platonic and Aristotelian physics.

Niccolo Machiavelli (1469-1527) turned the tides of humanism in a whole new direction, focusing on the selfish side of human nature rather than on humanity's potential. Machiavelli was a scholar and a professional politician. He was devoted to the Florentine Republic and became entangled in the battles between the wealthy families of Florence.

In most cities, family alliances created a complicated maze of factional rivalry and feuds. There were also serious class conflicts. Prestige was not passed on through bloodlines as in the aristocracy of northern Europe. Class was determined by wealth, which could be fleeting. The oldest families were constantly threatened by 'new men' who surpassed them in wealth. There was also a strong middle class in most of the cities, consisting of skilled artisans and merchants. Below them were the workers employed in industry or on the docks. The dissatisfaction of workers was often displayed in riots and revolts. Outside the cities were the peasants, subject to the control of middle class or wealthy landlords.

In 1434, after years of planning and maneuvering, Cosimo de'Medici, the head of a wealthy banking and mercantile family, was able to gain control of the government in Florence. His control of power and money made him a formidable opponent. Both Cosimo and his successor, Lorenzo the Magnificent (his grandson), were popular and able to maintain order. Enemies of Lorenzo plotted his assassination, arranging to have

him stabbed at Mass. Following the assassination, the public revolted and lynched many of the leaders of the revolt, including the bishop. After Lorenzo's death in 1492 the Medici family lost power. During this time a monk named Savonarola attempted to instill a reign of piety and virtue in the city (1494-1498). In 1498 Savonarola fell from favor and was burned as a heretic. The Florentine Republic survived him and it was during this period, from 1498 to 1512, that Machiavelli worked for the Florentine government as a chancellor and as the secretary to the council in charge of warfare, called the Ten of Liberty and Peace. His main concern during those years was to build up an efficient militia, made up of citizens and not mercenaries.

In 1512 the power of the Florence Republic toppled under threat of an invasion by the Spanish military resulting in the restoration of the Medici family. This meant the end of Machiavelli's career. When the Medici family discovered that Machiavelli was part of the plot against their government they had him imprisoned and tortured, finally exiling him to the mountains outside of Florence. Deprived of his role in government, an embittered Machiavelli turned to political commentary.

In 1513 Machiavelli wrote *The Prince*; this short book drew on the history of Italian city-states as well as Greek and Roman history. *The Prince* may have been intended more as an expose' and a satire on an exaggerated form of autocracy than as a set of maxims on how to achieve and retain power. In the book, Machiavelli did not attempt to derive the nature of the ideal state and the qualities of a good ruler from primary principles. Instead, he offered a potential ruler the recipe for success based on recent Italian history and the history of Greece and Rome. Machiavelli argued that a prince (as well as a pope) should strive to appear to be virtuous, but once in power should

use any means necessary to retain power, including deception, cruelty, and fear. His only caution was that while the Prince may impose fear on his subjects, he should avoid incurring their hatred. This, he advised, is accomplished by not meddling with their property or their women. When he asked the question as to whether the Prince should keep faith, he responded that the Prince cannot nor ought to keep his word if it is hurtful to him. Maintaining credibility for breaking faith is simply a matter of skill in deception. He singled out Pope Alexander VI, who obtained his election through bribery and pay-off, for distinction in this skill. He held up Cesare Borgia, the illegitimate son of Pope Alexander VI, as an example of political skill. Alexander was a Spaniard who was elected to the Pontificate in 1492. Borgia, a friend of Machiavelli's, worked via bribery and assassination to claim most of central Italy for the Borgia family.

Machiavelli emulated Ferdinand Aragon (1452-1516) as the foremost King of Christendom. With his wife Isabella of Castille (1451-1504) Ferdinand united the kingdom of Spain after years of civil war and conquered the Moorish kingdom of Granada. Ferdinand extended his reign to Spanish territories in America and drove both the Jews and Moors out of Spain, having obtained permission from Pope Sixtus IV to establish an independent Spanish Inquisition. From Pope Alexander VI, Ferdinand obtained a bull dividing the New World between Portugal and Spain, with Spain obtaining the largest share. Machiavelli praised Ferdinand's 'pious cruelty'.

Machiavelli's first version of *The Prince* was completed in 1513; it reached its final form in 1516 when he dedicated it to young Giuliano de Medici in hopes that his insights would be appreciated and he would be rehired into government service. *The Prince* was published in 1532, five years after his death, initiating a debate that has raged

ever since. After *The Prince*, Machiavelli later wrote *The Discourses on the First Ten Books of Titus Livy* which was a study in the success of the Roman Empire. Eventually a few of the less vengeful aristocrats began to see the wisdom of Machiavelli's words. In 1520, Cardinal Giulio de Medici, head of the Florentine University, commissioned Machiavelli to write a history of Florence. By the time Machiavelli completed his *History of Florence*, Giulio was Pope Clement VII, and Machiavelli was back in politics, though in humbler capacities. Within his history, Machiavelli compares fourteenth century Florence with ancient Rome. He condemned the wasteful conflicts between the nobility and the people, criticizing both for their self-interests rather than directing their energies toward the welfare of the Republic (Davies, 1996; Gay & Wexler, 1972; Guicciardini, 1972; Kenny, 1998; Seymour-Smith, 1998; Stipp, Dirrim, & Hollister, 1972).

Fifteenth Century Spain

Spain was rocked by wars between Islamic Moors and Christians, and between feuding nobles since the beginning of the Reconquista in the eleventh century. After 1248 the Moors retreated to the Sierra Nevada, preserving the nation of Granada under Islamic reign for another two centuries. Local Muslim leaders overthrew their African Moorish overlords and established themselves as a Muslim state dependent on Castille. The majority of the population was Spanish speaking and consisted of Muslim and Jewish immigrants.

The kingdom of Portugal, independent since 1179, controlled the Atlantic seaboard. The small kingdom of Navarre in the northwest corner of the peninsula was subject to France from 1234-1516. The kingdom of Castille, which controlled the largest area of the peninsula, ran from the northern seaboard to the southern coast, surrounding

Granada on all sides. Castille suffered from constant internal warfare between local nobles. The kingdom of Aragon, located in the western end of the peninsula, controlled the southwestern coast. Over the course of the thirteenth century, Aragon conquered and claimed Corsica, Sardinia, Naples and Sicily, and the Duchy of Athens. Aragon's domination of the western Mediterranean created a thriving maritime community. Unlike Castille, Aragon was a united nation. In 1287, by the Privilege of Union, the nobles of the various counties were permitted to take up arms against any king who dared to infringe on their rights. The result was a nation of unusual solidarity. In the fourteenth century, Aragon controlled the largest city in the Iberian Peninsula – Barcelona – and the largest city in Europe – Naples.

In the five kingdoms of Spain there were three religions, Christianity, Judaism, and Islam. The result of years of isolation resulted in a Christian population that was generally less sophisticated, but by the fourteenth century they were in full contact with other European Christians. The Moors in the south enjoyed a more sophisticated, urban lifestyle. The Spanish Jews, who gained a foothold in Spain through the tolerance of Muslim rulers, were spread throughout the peninsula. They were largely engaged in administration, medicine, learning, trade, and finance.

During the reign of Prince Henry of Portugal (1394-1460) expeditions were sent down the western coast of Africa. In 1437 the Colonial and Naval Institute at Sagres was founded. In 1441 Antam Goncalvez set sail from Lisbon, sailed down the Atlantic coast of Morocco, passed the Canary Islands and around Cape Bojador. After picking up his cargo he became enamored with the idea of taking a few of the local inhabitants as a prize for his master, Prince Henry. He managed to capture a local man and a local slave

girl. They were the first recorded victims of the European slave raid south of the Sahara. Soon after, Henry sent out a second ship to collect slaves. The ship returned to Portugal with twelve captives. Henry then sent an emissary to Rome to seek the Pope's blessing for this new type of crusade. The pope granted his blessing and went so far as to grant complete forgiveness of sins to all who engaged in the 'war' - the intent, supposedly, was to enslave the Africans and thereby convert them to Christianity.

Slavery had effectively disappeared in most of western Europe by the early twelfth century, although there were vestiges of it left in Iberia, predominantly within the Moorish population. The major slave markets in the fourteenth and fifteenth centuries were in Muslim lands, especially within the Ottoman Empire, and specialized primarily in the sale of European Christians. From the mid-fifteenth century on, Lisbon emerged as a significant market for enslaved Africans. Between 1440 and 1460 approximately fifteen to twenty thousand slaves were sold out of Lisbon. By 1505 over one hundred fifty thousand African slaves were imported into Europe. The slaves were typically owned as a status symbol. Large trafficking in slaves began with Portuguese expansion into their Atlantic colonies, where slaves were used to work the sugar plantations (Cantor, 1993; Davies, 1996; Coffin, Stacey, Lerner, & Meacham, 2002).

By 1471 the Portuguese claimed the Canaries (which they ceded to Castile), the Azores, and Tangier. Their seafaring ventures continued, improving their craft, such that by 1497 Vasco da Gama was able to complete an unbroken voyage from Lisbon to Calicut.

In 1469 Ferdinand, Prince of Aragon, was wed to his cousin, Isabella, Princess of Castille. Isabella, a devout Catholic, gained the claim to the crown of Castille in 1474

following the unlawful exclusion of her niece. Her accession to the throne initiated an international war with France and Portugal. Prince Ferdinand acquired the throne of Aragon through the exclusion of his illegitimate-born cousin, Ferrante of Naples, and the poisoning of his half-brother, Charles of Vana, Prince of Navarre.

For a short time Ferdinand and Isabella maintained the separation of Aragon and Castille. Eventually, however, the two nations were brought together under a common currency, removal of commercial barriers, and a shared enforcement of ultra-Catholic ideology. By 1483 Ferdinand and Isabella reorganized the two areas as a united Spain with a president, the Queen's confessor, the Dominican Thomas Torquemada (1420-1498). Treason and heresy were now practically synonymous. Non-conformers, Jews, and dissidents were persecuted. In 1481 Spain launched an attack on Granada. In 1492, after having made promises to the Moorish rulers, Granada fell.

Ferdinand and Isabella did not keep their promises of religious tolerance. Jews were given the option of conversions to Christianity or expulsion. As many as 20,000 Sephardic Jews chose banishment and were shipped off to Istanbul and Smyrna. The remaining Jews accepted conversion (conversos), although many remained secretly loyal to Judaism. In 1502 Muslims were given the same choice. Many migrated to Northern Africa; the others became converts known as moriscos.

Following the fall of Granada, Ferdinand and Isabella turned their attention toward expanding their territory abroad. Spain financed Christopher Columbus (1451-1506) with the intent of gaining a colony in the Atlantic islands. Columbus believed he could find a route to Japan and China by sailing west from the Canary Islands. Ten weeks after his departure from Palos, Columbus landed, kissed the ground, and named his

discovery San Salvador, claiming it for Castile and Leon. He had actually reached the Bahamas and the island of Hispaniola. He returned to Palos on March 15, 1493, convinced that he had discovered a route to the East Indies. Among his cargo were small samples of gold and a few indigenous people, providing evidence of a new group of people who might be 'saved' by conversion to Christianity and who could be enslaved by Europeans. Columbus recounted his experience in a letter to Ferdinand and Isabella

When we stepped ashore we saw fine green trees, streams everywhere and different kinds of fruit. I called to the two captains to jump ashore with the rest...asking them to bear solemn witness that in the presence of them all I was taking possession of this island for their Lord and Lady the King and Queen, and I made the necessary declaration...

Soon many of the islanders gathered round us. I could see that they were people who could be more easily converted to our Holy Faith by love than by coercion, and wishing them to look on us with friendship I gave some of them red bonnets and glass beads which they hung round their necks, and many other things of small value, at which they were so delighted and so eager to please us that we could not believe it...

However, they appeared to me to be a very poor people in all respects. They go about as naked as the day they were born, even the women...All the men I saw were quite young, none older than thirty, all well built, finely bodied and handsome in the face...

They are all the same sized, of good stature, dignified and well formed...They must be good servants, and intelligent, for I can see that they quickly repeat everything said to them. I believe they would readily become Christians; it appeared to me that they have no religion. With God's will, I will take six of them with me for Your Majesties when I leave this place, so that they may learn Spanish (Columbus, 2003, p. 185-186).

The success of the voyage encouraged Ferdinand and Isabella to finance more expeditions, including three by Columbus. Soon the mainland was discovered, as well as additional islands. Awareness of this new world was made famous through the widely publicized material of geographer Amerigo Vespucci (from which the name 'the

Americas' is derived). In 1493 Spain and Portugal appealed to the Pope to protect their interests in the new lands. Pope Alexander VI agreed to a boundary declaring that everything discovered west of a line lying 100 leagues beyond the Azores belonged to Spain, everything east belonged to Portugal. In 1494 in the Treaty of Tordesillas, the line was moved west an additional 250 leagues.

Portugal and Spain continued to explore and conquer their respective territories throughout the sixteenth century. Spain conquered the Aztecs of Mexico and the Incas of Mexico through deception and wholesale slaughter. The Portuguese seized control of trade in the Indian Ocean by defeating Muslim merchants and the Arab fleet. Portugal also claimed the area of present-day Brazil since it lay east of the demarcation line agreed to with Spain. The rest of South America and all of North America were claimed by Spain. Spain had two goals for its empire in the Americas and the islands of the West Indies – to exploit the wealth in their territories and to convert the Native Americans to Christianity (Davies, 1996; Farah & Karls, 1997; Coffin, Stacey, Lerner, & Meacham, 2002).

Although the world was now divided between Spain and Portugal, only they recognized the treaty. The Netherlands, France, and England joined the race in the sixteenth century to claim new territories beyond Europe.

The Northern Renaissance and Christian Humanism

During the middle to late fifteenth century, humanist ideas began to spread from Italy into northern Europe. The newly invented method of printing helped to promote the cultural diffusion. When France invaded Italy in 1494, Italian art and fashions fascinated King Francis I and his warriors. They brought Leonardo da Vinci and other Italian artists

and scholars to their courts in France. Other monarchs quickly followed suit. Kings and queens eagerly became patrons of the humanities. Some middle class Europeans began to travel to Italy to study with the Italian masters. Northern scholars not only learned from the Italians, but also interpreted the classics in accordance with their own individual ways of thinking. The people of each northern culture adapted the new ideas to their own particular needs and traditions.

In France, writers borrowed extensively from the style of Petrarch's sonnets. Pierre Ronsard wrote his own sonnets on love, youth, and immortality. French physician-monk Francois Rabelais wrote on a wide array of topics, including law, medicine, politics, theology, botany, navigation, and comic tales, satires, and parodies on contemporary life. He stressed an emphasis on living life to the fullest. Frenchman Michel de Montaigne (b.1533) wrote the first essays, setting an example for future authors on the art of writing frank and honest prose expressing his own personal views (Farah & Karls, 1997).

Montaigne represents the sixteenth century attraction to scepticism. In his *Apology for Raimond Sebond*, Montaigne presented the ancient Greek arguments against the possibility of genuine knowledge. He described the deception of the senses, the difficulty of distinguishing between dreams and waking life, the delusions brought on by drunkenness or disease, the differences in human judgement and the contradictions in philosophical systems. He held a poor opinion of the humanistic and scientific achievements of his day. He disparaged reason and claimed that grace and faith, not philosophy, show the way to truth (Kenny, 1998).

Renaissance ideas did not reach England until 1485. The Hundred Years War with France, followed by a 30-year struggle for the English Throne (known as the Wars

of Roses after the symbols of the rival royal families), delayed English adoption of the humanities. The Tudor family defeated the York family, bringing king Henry VII to the throne. Henry invited Italian Renaissance scholars to England to teach humanist ideas and classical texts. The Italian Renaissance was enthusiastically adopted in Germany and the Low Countries (present-day Belgium, Luxembourg, and the Netherlands).

Universities and schools promoted an education in the humanities (Farah & Karls, 1997).

In general, northern European humanists tended to be more interested in religious reform than in secular themes. Philosophy was devoted to issues of religion and created a schism in the Church. The most purely philosophical issue dividing Catholics and Protestants was the issue of human free-will. The majority of sixteenth century humanists and scholars expended their energy in religious pursuit and clarification of the will of God.

The most celebrated of the northern European humanists was Desiderius Erasmus (c.1467-1536). Orphaned at a young age, Erasmus was educated by the Brethren of the Common Life, a mystical lay movement in the Low Countries. In 1488 his guardians forced him to take vows as an Augustinian canon in 1488. Four years later he was ordained as a priest. He then traveled to the University of Paris where he studied the humanities. Erasmus became a master philologist; he became a master of the Latin language and his knowledge of Greek was unsurpassed in his time. He prompted people to take a more critical view of the Catholic Church and attacked the extravagances of the popes.

By 1500 Erasmus was a well-known scholar and diplomat and traveled to England where he became a friend of Sir Thomas More (1477-1535). After reading

Lorenzo Valla's *Notes on the New Testament* in 1504, Erasmus was convinced of the imperative to rid the New Testament of the errors in transcription and translation present in the Vulgate (St. Jerome's translation into Latin dating from around 400). He spent the next ten years collecting, studying, and comparing early Greek biblical manuscripts. In 1516 he published a new Latin translation of the New Testament, including explanatory notes. His translation was an important milestone in biblical scholarship and provided a basis for translation of the Latin Bible into the vernacular, a role assumed by John Wycliffe and Martin Luther in subsequent years (Coffin, Stacey, Lerner, & Meacham, 2002).

In 1509 Erasmus published *In Praise of Folly*, dedicating it to his friend Thomas More. In the book Erasmus poked fun in an ironic style at all the foolishness, corruption, and pompousness of the world, including the pope. Erasmus proposed that scholastic theology and Catholic religious observances be set aside in favor of a dedicated reading of the Bible.

Without having intended to, Erasmus prepared the way for the Protestant Reformation. He was later forced to choose between Martin Luther (the leader of the Protestant Reformation) and the pope. He supported Luther's complaints about the church, but could not support his dogmatism. Luther condemned the Greek classics; he declared man to be so utterly enslaved in original sin that he was incapable of discovering truth or of arriving at any goodness. In the end, Erasmus chose to support the pope because he had never really desired to be anything other than a sincere Catholic. He later wrote a piece critical of Luther, who answered in his brilliant way, and Erasmus

withdrew from the conflict (Green, 1885a; Seymour-Smith, 1998; Stipp, Dirrim, & Hollister, 1972; Van Doren, 1991).

Three years after Machiavelli published *The Prince*, Sir Thomas More published a book highlighting the benefits of a different type of government. Following up on the lead of his friend Erasmus, his book describes a perfect government, stripped of the follies of his world. His book, titled *Utopia* (1516), may well have served as another springboard to the Protestant Reformation.

More was an interesting character. By his early twenties he was a lawyer, by age twenty-six he held a seat in Parliament. He was so effective an orator and debater that he was able to garner Parliamentary support to strike down a bill proposed by King Henry VII, who subsequently fined and jailed Thomas's father in order to teach Thomas More to mind his words. Following the death of Henry VII, his son Henry VIII took the throne (1509). Under the reign of Henry VIII, More continued to rise in stature, serving first as the councillor and ambassador to France, and eventually as Lord Chancellor (1529) to the king.

In 1516 More published *Utopia*, knowing well the vices and vicissitudes of the European monarchies. *Utopia* describes an idyllic world, the Island of Utopia, where all citizens are equal and believe in a just and good God. The book opens with a conversation between More and a Portuguese traveler who describes an island he visited named Utopia (utopia is a Greek word meaning 'nowhere'). In the book More describes the first communist society, where property is regarded as the root of all social evil. Land is held in common, work hours are regulated, all men and women receive free education, and there is religious tolerance.

In Utopia, the shire (town) Philarchs (officers) select a set of candidates as prince. By secret election the Philarchs name the prince, who then reigns for the rest of his lifetime, unless he is deposed for tyranny. All residents of the island trade jobs regularly. Philarchs are elected to one-year terms. All residents (both men and women) learn husbandry and at least one other area of science or craft. All islanders wear identical clothing, and live in well-furnished homes, which are exchanged every ten years. No Utopians wear jewelry or covet gold. The few bondsmen, all of whom are guilty of heinous crimes, are held in bands and assigned hard labor, sparing conscientious Utopians from taking on laborious tasks. The sick are well cared for, but More allows for the provision of suicide and assisted suicide to end the suffering of Utopians stricken with incurable disease.

There are no lawyers; the council decides punishment for all crimes other than adultery. Men and women who wish to marry stand before one another naked to be assured they know what they are getting. He reasoned that one would not buy a horse without inspecting it naked of a saddle, so as to identify any deformities that may displease the buyer

And yet in choosing a wife, which shall be either pleasure or displeasure to them all their life after, they be so reckless, that all the residue of the woman's body being covered with clothes, they esteem her scarcely by one handbreadth (for they see no more than her face), and so to join her to them not without great jeopardy of evil agreeing together, if anything in her body afterward should chance to offend and mislike them. For all men be not so wise as to have respect to the virtuous conditions of the party. And the endowments of the body cause the virtues of the mind more to be esteemed and regarded, yea, even in the marriages of wise men. Verily, so foul deformity may be hid under those coverings, that it may quite alienate and take away the man's mind from his wife, when it shall not be lawful for their bodies to be separate again. If such deformity happen by any chance after the marriage is consummate and finished, well, there is no remedy but patience...But it were well done that a law were made

whereby all such deceits might be eschewed and avoided beforehand (More, 2003, p. 197).

It is claimed that More practiced what he preached. More, being approached by Sir William Roper to marry one of his daughters, took Sir Roper into the bedroom where his daughters lay sleeping, whipped back the bed-covers, and revealed his daughters, with their bedclothes up around their arms, to the scrutiny of Roper. Upon being startled the girls rolled to their stomachs, revealing their backsides. Sir Roper is credited with claiming one of the girls with a pat on the buttocks after having satisfactorily viewed both sides (Lewis, 2003).

In *Utopia*, a mutually agreed upon divorce is allowed with permission of the council after full examination of the matter. Adultery, however, is punishable by bondage. It is the responsibility of husbands to chastise their wives, and parents their children, unless the offense requires open punishment by the council. The death sentence is not permitted since bondage and labor were of greater asset to society than the death of the offender.

In *Utopia*, More raises doubts in the efficacy of the European systems of government. While proposing to describe a fictitious island, the book is really an indictment of the abuses of European power. In his communal system, the people live together in a loving relationship with one another and with the elected magistrates of the shires. Even the prince and the bishop wear the same clothing as other Utopians, being distinguished only by carrying a little sheaf of corn (by the prince) or a candle (by the bishop). Men are honored for notable deeds, and punished only by order of an elected council. Kings are deposed for acts of tyranny. Marriages are arranged with full disclosure. Men and women are both educated and provided equal rights. War is not

fought for the acquisition of property, but only in defense of the community. Prisoners of war are not taken into bondage, but given the opportunity to fully join society or leave the island.

More's book provided the first introduction of the word 'utopia' into the English language. In *The Prince*, Machiavelli described how a brutal prince could maintain power. More described a communally governed, moral society. While the monarchies of Europe pursued a Machiavellian course, religious leaders worked toward creating a Christian version of utopia (Coffin, Stacey, Lerner, & Meacham, 2002; Davis, 2004; Lewis, 2003; Van Doren, 1991).

A list of European scholars, including Desiderius Erasmus, Thomas More, Englishman John Colet (c.1467-1519), German Ulrich von Hutten (1488-1523), Frenchman Jacques Lefevre d'Etales (c. 1455-1536), and the Spaniards Cardinal Francisco Ximenes de Cisneros (1436-1517) and Juan Luis Vives (1492-1540) all made contributions to Christian humanism, editing biblical and early Christian texts and promoting morality as described in the New Testament. Between 1500 and 1525 there was a high degree of solidarity within the humanist movement in Europe, supported in large part by the popes. The irony is that the humanist emphasis on translation and interpretation of ancient texts, accompanied with the critique of clerical corruption and excessive religiosity, laid the path for the Protestant Reformation, in direct defiance of the Catholic Church from where the humanists emerged. The emergence of Luther brought about the decline of Christian humanism. The older generation of Christian humanists was unwilling to follow the route prescribed by Luther, with his outright rejection of the Catholic Church. As the war between Catholicism and Protestantism

developed, the lines between the two groups hardened. Humanists found themselves on uncertain footing between the two religions and forced to choose. Erasmus, for example, chose the Catholic Church in hopes of internal reform. Others who chose Catholicism, but advocated reform, were included in the ranks of Protestant heretics and fell victim to the Inquisition (Coffin, Stacey, Lerner, & Meacham, 2002).

ACT TWO

Scene 3

JUSTIN: *(sighs)* So, Minerva – long answer to a short question.

MINERVA: I guess you need to be careful what you ask! There's always a lot more behind a comment or question than you might think.

JUSTIN: Let me see if I got a grasp on all this...*(he leans back in his chair and looks up into the rafters)*. The plague hits; people who survive live it up; they look around for different answers to why they exist; they dig up the old Greek philosophers and a few of the big thinkers challenge the church. Next comes along the printing press; word spreads; people debate whether God pre-determined everything or is just omniscient and now the western world has got a problem with the pope. *(He looks back at Minerva.)*

MINERVA: Yes, and don't forget that while all this was going on, the Spanish and Portuguese were exploring the world and starting back up the practice of slavery in Europe. An interesting dichotomy, don't you think?

(Abby walks around and fills everyone's tea cup while David stokes the fire)

JUSTIN: Ok, I missed that one.

ADAM: Think about it, man – while the humanists were trying to learn about everything and argue against the authority of the church, there were the Spanish taking control of other people. Europeans hadn't had slaves for centuries. Now all of the sudden owning a slave becomes a status symbol. Fighting for equality and instituting slavery all at the same time!

BILL: You're right, Adam. Remember when Minerva told us that the English peasants revolted because of the preaching of John Ball? He was teaching that the Bible said everyone was equal. All the while another group of Europeans were starting to traffic in slaves. The humanists were adopting the Greco-Roman idea of dignity and worth for all citizens. No one seemed to have a problem with the idea that dignity and worth were related to the group you were born into.

(Irene moves across the Great Room to look out at the snow storm)

MARY ANN: It's all a little confusing to me. I think you said the goal of the humanists was to have a grasp of all scientific knowledge. And then you said they applied that knowledge to the study of ancient text and the Bible. What has religion got to do with science?

MINERVA: Good question, Mary Ann. For centuries the main subject of knowledge was theology. All education was based on the Bible. It was the history book upon which all the history of mankind was taught. The Bible, of course, also has to do with man's relationship to God. Therefore, all knowledge focused on God. Even science among non-Christians was spiritually driven. The ancient Romans were pagan and still attributed all events to the gods. Aristotle and Plato wrote about the nature of *being*. They disagreed, but their opinions made an impact on

Christian beliefs. As men, and some women, began to study what we refer to as science, it was of course applied to our understanding of God. The first scientists were searching for how God set everything into motion.

BILL: Nice job, Minerva – sounds like a fine topic for a Sunday sermon.

MINERVA: Thanks, Bill – but don't get too excited. The next phase of history didn't cast

any of the formal Christian religions in a very favorable light.

BILL: Do you mean the Protestant reformation?

MINERVA: Yes.

BILL: I know. Man has the capability to mess up anything good – seems to be part of our nature!

MINERVA: Hold that thought, Bill – we may have to come back to that one.

(Abby and David move back over to the couch and settle in next to each other)

JAKE: That's what I like about science – nice and clean without any messy metaphysics to interfere. I chose engineering as a career because I didn't like all that humanities rig-a-marole.

MINERVA: Really! Well, religion may stir the emotions, but it took science to make societal problems widespread.

JAKE: You mean because technology creates the ability for large-scale attack.

IRENE: *(standing next to the window and hugging a blanket around her shoulders)*. Yes, Jake, and that's what scares me. I have been a military wife now for over forty years. I have sat home while Bill went off to the front to minister to men and women who were fighting a war. The stories I heard would make you shudder.

Science is not clean, and neither is religion. If we don't figure out pretty soon that this is the only planet we get and that life IS short, then may God take mercy on us and find a way to stop us all. *(She crosses the room and sits down next to Bill, he puts his arm around her with a reassuring hug.)*

JAKE: Sorry, Irene. I know you're right. But science seems so clean while you're in the laboratory. I know we should stop to think sometimes about what we are exploring and what it can lead to. But I'm the eternal optimist and I think that ultimately science will make it possible for us to end all disease and poverty. We will never create a utopia with religion – why not try science?

MINERVA: Interesting comment and question, Jake, and one that has been pursued by many. Science hasn't created that utopia yet. Science gives mankind the ability to create items for comfort or for destruction, but it is our philosophy that determines how we will use it. For the two to work separately or in a vacuum is dangerous. One without the other provides an incomplete picture of humanity.

LINDA: Why do you think it took so many centuries before we started to explore science?

MINERVA: Well, for years the single authority of the church, coupled with the low population and the widespread agrarian society, created conditions that effectively suppressed any questions or exploration that defied religious dogma. Then along came the printing press. The division in the church created a crack in the armor the church used to shield out any ideas they considered heretical. Once Luther challenged the Catholic Church he opened the door to other heretical ideas.

DAVID: Interesting – what did the Church consider to be heresy?

MINERVA: The early scientists all believed that God created the universe – their heresy was simply their proposal of different hypotheses. Many of their discoveries differed from Church interpreted Biblical accounts about *how* God created the universe.

LINDA: Sorry to be so ignorant, but I am not a church-goer. What did Luther do, that made such a big difference?

MINERVA: It all started around the beginning of the sixteenth century...

The Protestant Reformation (1517-1550)

While Machiavelli was writing *The Prince*, Martin Luther (1483-1546), an Augustinian monk, began to challenge the Pope. Luther eventually led half of Europe to reject Papal authority. Although Luther is credited with precipitating the Protestant Reformation, it was facilitated by the work of John Wycliffe, William Tyndale, Desiderius Erasmus, and others who played a significant, if unwilling, part in the emergence of Protestantism.

Luther attended the University of Erfurt to pursue a legal career. In 1505 he was nearly struck by lightening; terrified that the storm was an indication of God's displeasure with him, he knelt and prayed to Saint Anne. In return for her protection, he promised to become a monk. Shortly after the storm, he entered a hermit order of Augustinian monks. Ordained in 1507 he went on to receive his doctor of theology in 1511 from the University of Wittenberg.

As a young monk, Luther struggled with the idea of ensuring his salvation. He would confess his sins for hours and he still worried that God might not find him

acceptable. Then he read St. Paul's Epistle to the Romans and understood Paul to teach that a person could be made just, or good, simply by faith in God's mercy through Christ. Luther's idea became known as justification by faith. By the time Luther became a monk, the church was already in a state of turmoil. The humanistic and classical scholarship of Lorenzo Valla stimulated interest in the early Christian theologians and questioned the authority of the pope. Humanists were encouraging the use of practical reason to denounce hypocrisy, abuses, and metaphysical nonsense. Nationalism, especially within Germany where the battles between the emperors and popes had raged for centuries, created resentment over church taxes. Christian humanists Erasmus and Thomas More were advocating changes within the Church. Members of a movement called *Devotio Moderna* (Modern Devotion), which included Erasmus, attacked the rituals, the superstition of devotion to the saints, and the sale of indulgences.

Luther's ideas gradually brought him into conflict with the Church. At the time, Pope Leo X was trying to raise money to rebuild St. Peter's Basilica in Rome. In order to do so, the pope sold church positions and authorized the sale of indulgences (certificates issued by the Church that were said to reduce or cancel the punishment for a sin already forgiven). People purchased the certificates believing the certificates would guarantee their admission to heaven. John Tetzel, the Church agent selling the certificates in northern Germany, went so far as to guarantee that the certificates were good for remission of punishment for future sins. He also encouraged the purchase of indulgences for dead friends and relatives. Luther preached against the sale of indulgences and other Church practices he believed were corrupt.

The Protestant Reformation began on October 31, 1517, when Luther nailed his Ninety-five Theses to the door of All Saints' Church in Wittenberg. Taking advantage of new technology (the printing press), Luther printed copies of his theses and sent them to his many colleagues. Kings and princes, seeking reform for political and personal reasons, backed Luther. People throughout Europe agreed with his position and demanded both national independence from Rome and individual religious independence from the Catholic Church. In 1520 the pope condemned Luther and banned his works. In 1521 Pope Leo X excommunicated Luther from the Church. Shortly after, a German council of princes in Worms met to try to bring Luther back into the Church. In front of the assembly, Luther refused to recant and was sentenced to banishment from the Empire. Condemned as a heretic and outlaw, Luther fled to Wartburg under the protection of Prince Frederick of Saxony. King Henry VIII of England, a trained theologian, came out in support of the pope. Henry issued an *Assertion of the Seven Sacraments* for which he was rewarded by the pope with the title 'Defender of the Faith'.

While in hiding, Luther translated the New Testament into German, wrote a number of articles, including one that denounced Aristotle as an enemy of grace, and formed the first Protestant faith, Lutheranism. Although similar in many respects to the Catholic Church, Luther stressed several teachings that distinguished Lutheranism. Most important was the teaching of salvation by faith. Secondly, he taught that all religious truth comes only from the Bible. Third, worship services were held in the local language instead of Latin. Fourth, the Lutheran church was not a hierarchy of clergy – it was a community of believers where all participants were of value (Farah & Karls, 1997; Kenny, 1998; Seymour-Smith, 1998; Stipp, Dirrim, & Hollister, 1972; Van Doren, 1991).

The Spread of Protestantism

The movement started by Luther did not long remain under his control. Independent groups of reformers sprouted up across Europe, especially in Switzerland under the leadership of Huldrych Zwingli (1484-1531) and John Calvin (1509-1564). Zwingli, a Swiss priest, led the Protestant movement in Switzerland. He supported Luther, but took Luther's premise of separation from the Catholic Church and applied it to the state. He wanted to establish a theocracy in the Swiss city of Zurich. By 1525 he achieved his goal, but in 1531 war broke out over Protestant missionary activity in other areas of Switzerland. Zwingli and his force of 1,500 followers were defeated by any army of 8,000 Catholics.

In 1536 John Calvin published his theological doctrines in *The Institutes of the Christian Religion*. The basis of his theology was that God is omniscient, omnipresent, and all-powerful. He established the doctrine of predestination, stating that God directed everything in the past, and directs everything in the present and future, including the fate of every individual person. His book was soon one of the most popular books of its day, influencing reformers in Europe and later in North America.

In the mid-1500s John Calvin followed Zwingli's lead and established a theocracy in the Swiss city of Geneva. In 1541 he established the Consistory, a church council of twelve elders, who had the power to control almost every aspect of people's daily lives. All people were required to attend services at the Reformed Church several times per week. Laws forbade fighting, swearing, drunkenness, gambling, card playing, and dancing. Harsh punishment was dealt to any citizen who broke the laws. People convicted of holding Catholic beliefs or practicing witchcraft could be executed. Geneva

earned the title of 'City of God' and attracted reformers from all parts of Europe. The visitors spread Calvin's teaching throughout Europe. The people of the Netherlands and Scotland became ardent followers of the Reform Church. John Knox, a leader of the Reformation in Scotland, encouraged followers to overthrow tyrannical rulers (Farah & Karls, 1997).

Following a poor harvest in 1524 peasants and lower-class townsmen in Switzerland began to rise up in revolt against the secular and religious lords in the name of the Gospel and the Christian brotherhood. The printed program *Twelve Articles of the German Peasantry* spread across Germany in 1525. A group of princes, organized as the Swabian League, decided to suppress the Peasant's Revolt and use it as a lesson to all who would decide to defy their 'Christian princes'. The death toll counted about 100,000 peasants and 100 princely soldiers. Popular resistance to authoritarian rule in Germany was halted, but the Anabaptists spread out in the wake of the revolt (Stipp, Dirrim, & Hollister, 1972).

The Anabaptists initiated the practice of baptizing only adult members, believing that an individual had to be old enough to make an informed choice to become a Christian. Many Anabaptists also denied the right of local authorities to direct their lives. They refused to hold office, bear arms, or swear oaths. They separated themselves from society. Most were peaceful, but a group of zealous Anabaptists seized power of the German city of Munster in 1534 and proceeded to burn books, seize property, and practice polygamy. Lutherans and Catholics united to crush them, killing the leaders and persecuting any remaining Anabaptists. As a result, many Anabaptist groups moved to

America during the 1600s promoting the idea of religious liberty and separation of church and state (Farah & Karls, 1997).

In 1534 England split from the Catholic Church due to intrigue on the part of King Henry VIII. Soon after his accession to the throne Henry married his brother's widow, Catherine of Aragon, who was also the aunt of the emperor of Germany. Henry had to obtain special dispensation from the pope since many considered the marriage a form of incest. At first Henry was pleased with Catherine, but several of her children were stillborn and the only surviving child was a girl, Mary, who was to become the future queen. Annoyed with her inability to produce a male heir, Henry entered into an affair with Anne Boleyn, the sister of a previous mistress. Ann promised him a son if he would divorce Catherine and make her queen. He now faced a dilemma. Divorce was not permitted in the Catholic Church.

Meanwhile, the embers of reformation started by Wycliffe and the Lollards were still burning among the people of England, requiring only a leader to bring them to full blaze. That leader was William Tyndale. Tyndale obtained a copy of Erasmus's Latin translation of the New Testament while at Cambridge. Tyndale, fearing persecution in England, moved to Germany to work on the English translation. In 1525 Tyndale succeeded in translating the Latin New Testament to English. The new English translation was accompanied with tracts by Wycliffe. In 1526, six thousand copies of the New Testament were sent to England. The king opposed the translation of the Bible, which he felt was prompted by the teachings of Luther. Thomas More, advisor to the king, denounced the book as heretical; orders were issued for all who possessed the book to relinquish it. The orders were disregarded; Bibles were smuggled into England and

circulated among the poor. Protestantism began to take hold regardless of persecution by the monarchy.

In 1526 Henry sent an emissary to gain Pope Clement VII's consent for an annulment of his marriage to Catherine on the grounds of incest. Clement's consent would require a break with emperor Charles V of Germany, who held deep feelings of family loyalty and would not wish to see his aunt insulted. Clement withheld approval. Henry demanded that his first minister, Cardinal Wolsey, remedy his problem. Wolsey tried every intrigue he could think of to no avail. In his anger over the situation Henry charged Wolsey with treason; Wolsey was imprisoned and forced to forfeit his possessions to the crown; Henry later pardoned Wolsey and permitted him to retire to his diocese in York, the sole possession he was allowed to retain. Henry replaced Wolsey with a new minister, Thomas Cromwell. Cromwell advised the king to disavow the pope and to set himself up as the supreme authority in England, both in spiritual as well as temporal matters. Henry did just that. In 1532 Henry split with the Catholic Church, formed the Church of England, divorced Catherine, and married Anne Boleyn.

Among the king's closest advisors only his Lord Chancellor, Thomas More, objected to the new policy. Cromwell drafted a new law declaring Henry the supreme head of the English Church. More could not abide the law and refused to take an oath declaring the king of England supreme in all religious matters. More was charged with treason, tried, convicted, and sentenced to a traitor's death – beheading. More died on July 6, 1535. During the eight years that Cromwell ruled, in Henry's name, the English Reformation ran apace. Cromwell disbanded the monasteries in England, absorbing their vast wealth into the crown, thereby doubling the wealth of the king.

Following More's death, a reign of terror ensued. The king soon tired of Anne. She too had only provided him with a daughter, Elizabeth I. Anne's failure resulted in her death on the block. Her successor Jane Seymour died in childbirth, having given birth to Edward VI. After a three-year search Cromwell found a suitable replacement in Anne of Cleves. Henry disliked Anne and divorced her. Cromwell paid for his mistaken choice and died on the scaffold. Henry's fifth wife, Catherine Howard, proved to be promiscuous and was beheaded as well. His sixth wife, Catherine Parr, remained with him until his death in January 1547.

Henry ruled England with the same tyrant mentality with which he ruled his wives. All constitutional safeguards of English freedom were discarded. Arbitrary taxation, legislation, and imprisonment powers were used by the monarchy.

Following Henry's death, his heir, the sickly nine year old Edward VI, came to the throne. The Protestant duke of Somerset ran the government in Edward's name until 1550, allowing the English Reformation to veer toward a popular form of Protestantism. Edward was deposed because of his political views and his successor, the Protestant duke of Northumberland, turned England even further toward Protestantism. Upon the death of Edward in 1553, Henry's Catholic daughter, Mary, returned to England by order of the Pope and became queen. Mary tried to restore Catholicism in England and had hundreds of Protestants burned at the stake, earning her the name 'Bloody Mary' and strengthening Protestant resolve.

Mary's Protestant half-sister, Elizabeth I, took the throne in 1558 following Mary's death from a fever. To unite Englishmen, Elizabeth made the English Church Protestant with Catholic features, renaming it Anglican. This blend pleased most

churchgoers. A small sect of believers insisted on removing all Catholic rituals and strove to purge the remaining vestiges of Catholicism, thereby purifying the Church. These Protestants became known as Puritans (Farah & Karls, 1997; Green, 1885a; Van Doren, 1991; Stipp, Dirrim, & Hollister, 1972).

During the Catholic Counter Reformation, Pope Pius V took a strong stance against heresy. He introduced a list of books that Catholics were forbidden to read or possess. He built a palace for the Holy Office of Inquisitors. He excommunicated Queen Elizabeth and released her subjects from obedience to her.

A Century of Religious Wars

The single greatest cause of war between 1540 and 1660 was religious conflict. Wars between Catholics and Protestants in Germany began in 1540 when the Holy Roman Emperor Charles V (Emperor 1519-1556), a devout Catholic, tried to reestablish Catholic unity in Germany. Charles was not a German. As a paternal member of the Hapsburg family, he was born and raised in the Netherlands (in the town of Ghent). He also held Austria, and as a grandson of Ferdinand and Isabella by maternal descent he held all of Spain, including extensive Spanish possessions in Italy and America. His emphasis was international rather than local, and he likely thought of Catholicism as the fabric necessary to hold together all of his far-reaching territories. As such, Charles had no sympathy for Martin Luther. While Charles was preoccupied with a war with France, several German princes formally converted to Lutheranism, taking their territories with them. The German princes realized that conversion to Lutheranism would sever their financial ties to the Church, returning ecclesiastic dues to their own treasuries. By 1530, when Charles once again turned his attention toward Germany, a considerable part of the

German populace had converted to Protestantism, claiming their own local governments as sovereign over both religious and secular matters.

Charles' efforts to defeat the Protestant princes failed. He found himself fighting not only the Protestant princes, but also the Catholic princes, who feared that Charles might suppress their own independence as well. Charles finally conceded defeat and a compromise settlement was reached in the Religious Peace of Augsburg (1555). The Peace of Augsburg granted the right of the ruler of each region to determine the religion; principalities where Lutheran princes ruled were Lutheran, and in principalities where Catholic princes ruled their territories would be Catholic also. Each sovereign state was permitted to restrict religious freedom to the religion of the ruling class. Only the German Calvinists were carved out of the equation, setting up aggressive Calvinist opposition to the status quo.

John Calvin, being French born, desired to convert his home country. Calvinist missionaries made considerable gains in France between 1541 (when Calvin took power in Geneva) and the outbreak of religious war in France in 1562. By 1562 ten to twenty percent of the French population had adopted Calvinism. Greatly assisting the Calvinist (Huguenot) cause was the conversion of many aristocratic French women, who in turn influenced their husbands who maintained large private armies.

In 1562 the French king died unexpectedly, leaving his child as heir. A struggle immediately broke out between Catholics and Huguenots for control of the regency government. Both Catholics and Protestants believed that the faith of the king would determine the faith of the country and its laws. Soon, all of France was embroiled in the controversy. Although the Huguenots were in the minority, they were too strong to be

defeated and warfare dragged on until 1572 when a truce was arranged. The truce called for the Protestant leader Henry of Navarre to marry the Catholic sister of the reigning French king. At this point the French queen mother, Catherine de Medici, broke the truce. Catherine plotted with members of the Catholic faction under the Duke of Guise to kill all the Huguenot leaders while they were in Paris for her daughter's wedding to Henry of Navarre. In the early morning of St. Bartholomew's Day (August 24), most of the Huguenot leaders were murdered in their beds and two to three thousand other Protestants were slaughtered throughout the city by Catholic mobs. When word of the Parisian massacre spread to the provinces, another ten thousand or more Huguenots were killed in a hysteria that spread throughout France. Henry of Navarre escaped, along with his new bride. Henry inherited the French throne as Henry IV (r. 1589-1610), initiating the Bourbon dynasty, which ruled until 1792. In 1593 Henry made concessions in order to accommodate France's Catholic majority in the Edict of Nantes. Although the Edict recognized Catholicism as the official religion of the kingdom, Huguenot nobles were allowed to hold office and to hold worship services privately in their castles or specified places (excluding Paris). Huguenots were also permitted to hold and fortify some towns, especially in the south and west, for their own military defense. Although the Edict intended to create one kingdom with two faiths, the French citizenry divided into separate religious enclaves with separate legal systems.

In 1560 warfare broke out once again between Catholics and Protestants in the Netherlands. When Charles V retired to a monastery in 1556 (dying two years later) he ceded all his territories outside of the Holy Roman Empire and Hungary to his son Philip II (r. 1556-1598). Unlike Charles, Philip was born in Spain and preferred to rule from

Spain. He viewed the Netherlands as a source of income to support Spanish affairs. With this in mind, Philip attempted to govern the Netherlands more directly than his father, rousing the ire of the populace. The spread of Calvinism in the Netherlands heightened the tensions. As an ardent Catholic, Philip II was a strong believer in the goals of the Catholic Reformation. Prior to the conflict he wrote to the papacy in Rome stating that “rather than suffer the slightest harm to the true religion and service of God, I would lose all my states and even my life a hundred times over because I am not and will not be the ruler of heretics” (as cited in Coffin, Stacey, Lerner, & Meacham, 2002, p. 525).

In 1566 radical Protestants in the Netherlands embarked on a rampage, ransacking Catholic churches, desecrating hosts, smashing religious statuary, and shattering stained-glass windows. Even though local troops regained control, Philip dispatched an army of ten thousand under the command of the Spanish duke of Alva to wipe out Protestantism in the Low Countries forever. Alva’s tribunal, the ‘Council of Blood’ examined twelve thousand people on charges of heresy, of whom nine thousand were convicted and one thousand executed.

William of Nassau, one of the richest men in Europe (due to his inheritances in Germany, Provence, and Brabant), opposed King Philip. Although born a Lutheran, William was raised a Catholic and was a supporter of King Charles V. He became known as William the Silent for his ability to hide his true religious and political feelings when the need arose. He was actually very talkative and opposed Philip II because of his Spanish connection. While serving as an imperial representative to the 1559 Treaty of Cateau-Cambresis (which brought an end to the war between France and Spain), William heard of Spanish plans to subdue the Netherlands; he developed a lifelong distaste for the

connivance of the Spanish throne. After fleeing the Netherlands in 1566 he converted to Protestantism, sought help from Protestants in France, Germany, and England, and organized bands of sea rovers to harass Spanish trading ships along the Netherlands coast.

Alva's tyranny and his imposition of a ten-percent sales tax aided William's cause, which was the liberation of the Netherlands from Spanish rule. In 1572 William seized the northern Netherlands. Spanish armies repeatedly tried to regain the northern territory to no avail. Geographic conditions supported the entrenchment of Protestant forces. Although a Catholic assassinated William the Silent in 1584, his son continued to lead the resistance. Philip finally agreed to a truce in 1609 and implicitly recognized the independence of the northern Dutch Republic, which was now Calvinist. The south remained under Spanish control and returned to uniform Catholicism (Coffin, Stacey, Lerner, & Meacham, 2002; Davies, 1996).

In 1618 a major new war broke out, this time in Germany. Referred to as the Thirty Years' War, Spain, Germany, and France all engaged in battle with one another. The Thirty Years' War began as a war between Catholics and Protestants and quickly raised German constitutional issues, ending as an international struggle in which the religious differences were almost totally forgotten. Between the Peace of Augsburg in 1555 and the outbreak of war in 1618 Calvinists had replaced Lutherans in some of the German territories. In 1618 war broke out when German Calvinists rushed to the aid of Bohemians in their battle against Ferdinand II, the newly elected king of Bohemia who opposed Protestantism. German Catholics launched a ruthless counterattack, first in Bohemia and then in Germany. Ferdinand became Holy Roman Emperor in 1619 and

leader of the German Catholic forces. Within a decade the German Catholic league was close to eradicating Protestantism throughout Germany.

Ferdinand's success, however, once again raised the prospect that a powerful Holy Roman Emperor might threaten the autonomy of the German princes, including the Catholics. Thus, when the Lutheran king of Sweden, Gustavus Adolphus, marched into Germany in 1630 to support the Protestant cause, he was welcomed by several of the Catholic princes. Ironically, Catholic France, with the approval of Cardinal Richelieu, subsidized Gustavus' Protestant army. Richelieu was determined to resist any possibility of France being surrounded by Hapsburg alliances (Spain and Austria). Gustavus' army was successful, but when he fell in battle in 1632 Cardinal Richelieu was forced to send support for the Swedish troops. In 1635 he sent the French army to join Swedish forces. From 1635-1648 the struggle was one of France and Sweden against Austria and Spain with Germany as the battleground.

Germany suffered terrible losses. German cities were besieged and sacked repeatedly. Soldiers, who sustained themselves through plunder, gave no mercy to defenseless civilians. Plague and disease added to the misery. Some parts of Germany lost more than half their population while others remained out of harm's way. The Peace of Westphalia finally ended the Thirty Years' War in 1648 with France declared the winner. The Austrian Hapsburgs were forced to surrender all the territory they had gained in Germany. Germany reverted to the religious division of 1618, with Protestant principalities in the north balancing Catholic ones in the south.

The division in religion that took so many lives was an unnecessary tragedy. Men had debated the points of religion for centuries without leading to warfare. It was the

greed of monarchs and an increase in nationalism and the resulting resentment of international control that led to bloodshed.

The result of the schism was suppression of freedom of thought. Although heresy was persecuted in the Middle Ages, the independent thinking of university professors was tolerated within limits. The curriculum in medieval universities allowed for open speculation. Even though the printing press made books more accessible in the Renaissance period, the Catholic Church published an *Index* of prohibited books, which banned the reading of particular books. Even some of the various Protestant movements, such as Calvinism, restricted freedom of thought (Coffin, Stacey, Lerner, & Meacham, 2002; Davies, 1996; Stipp, Dirrim, & Hollister, 1972; Van Doren, 1991).

The Catholic Reformation

Prior to the threat of Protestantism, a reform movement began in the Catholic Church, inspired by the principles of Christian humanism. In 1542 the Church authorized an Inquisition in Italy. The purpose of the Inquisition was to find, try, and judge heretics, especially Protestants; the purge of non-Catholics re-established papal domination of the Church in Italy. Reforms, however, were slow and sporadic, taking place primarily in Spain. Cardinal Francisco Ximenes de Cisneros (1436-1517), with the support of the Spanish monarchy, led the imposition of strict rules on Franciscan friars and the elimination of abuses by the clergy. Ximenes' main goal was to strengthen the church during the Spanish Inquisition, but it also had the effect of renewing Spanish Christianity.

Once the Protestant Revolution began to sweep over Europe, the papacy adopted a more aggressive stance on reforming the Church. The popes of the sixteenth century were all zealous reformers, all living austere and ascetic lives. These popes replaced

bishops and abbots with men as austere as themselves. The Council of Trent, which met on a regular basis between 1545 and 1563, reaffirmed all the doctrines of the Church that were challenged by the Protestants. Good works, the doctrine of the sacraments, transubstantiation, apostolic succession of the priesthood, belief in purgatory, the invocation of the saints, the rule of celibacy for the clergy, and papal authority over all bishops and priests were all expressly maintained. The Council condemned the Lutheran doctrine of justification by faith alone and proclaimed that human free-will ended with Adam's fall.

The Council also addressed the issue of lifestyle for all Catholics. Only officially approved and centrally directed observances were condoned. Books containing heretical ideas were banned. The Council declared St. Jerome's Latin translation of the Bible, known as the Vulgate, to be the only official version to be used by the Catholic Church. Scholars had already exposed the errors of interpretation in the Vulgate version of the Bible. The Council declared these errors to also be part of divine revelation, and thus were somehow preferable to the original meaning in the Greek Scripture (Coffin, Stacey, Lerner, & Meacham, 2002).

The Council also authorized the formation of the Jesuit Order (also referred to as the Society of Jesus). The original order of Jesuits were led by the Spanish nobleman Ignatius Loyola, an ex-soldier turned priest. The Jesuits all took a four-part vow; to the three monastic vows of poverty, chastity, and obedience was added the vow of strict obedience to the Vicar of Christ (the pope). The Jesuit priests spread throughout Europe, using the power of speech rather than the power of weapons to win converts to Catholicism. In some areas they were martyred. In Poland, parts of Germany, and France

they succeeded in regaining territory lost to Protestantism. Wherever they settled, the Jesuits established schools, believing that vigorous Catholicism required widespread literacy and education. Their schools became highly regarded.

By the time the Council of Trent ended in 1563, Calvin was dying and Luther was dead. Germany was partitioned between Lutherans and Catholics. England plunged from a schism with Catholicism under Henry VIII, to Calvinism under his son Edward VI, to counter Reformation under Henry's elder daughter Mary and her husband Philip II of Spain, and finally to Anglicanism under his younger daughter Elizabeth I. Pope Pius V (papacy from 1566-1572), the most devout of the sixteenth-century popes, excommunicated Queen Elizabeth and released her subjects from obedience to her. His most serious attempt to enforce his sentence resulted in the English defeat of the Spanish Armada in 1588 (Kenny, 1998).

Humanism lost favor and support under the sixteenth century popes. All of the writings of Desiderius Erasmus, a humanist Christian, and any scholar who presented ideas in opposition to the position of the Catholic Church, were placed on the *Index of Prohibited Books*. In the absence of the classical texts, theologians returned to the scholasticism of Thomas Aquinas for guidance. In the end, the Catholics accepted the dignity of human reason, tempered by a belief that the writings of the greatest philosophical minds of classical antiquity were compatible with Christian truth. The Protestants, even more violently opposed to philosophy than the Catholics, rejected reason as a source of belief and emphasized Scriptural authority and unquestioning faith.

The sixteenth century represents a shift in philosophy. In the Middle Ages, philosophers devoted themselves to metaphysics. During the Renaissance, attention was

diverted from philosophy and the focus was literature and the rediscovery of ancient texts. The Protestant Reformation and Catholic Reformation of the sixteenth century turned scholars' attention toward the schism in the Church, which degraded into sectarian controversy (Coffin, Stacey, Lerner, & Meacham, 2002; Farah & Karls, 1997; Kenny, 1998).

Religion and Seventeenth Century Absolutism

Theologians of the Renaissance and the Reformation argued that God granted kings their authority to rule; that they were in fact, God's agents against whom resistance was resistance to God Himself. By 1600 the divine-right doctrine for kingship was well established. Roman Catholic and Protestant clergy appointed by kings cited Scripture to prove kings were direct agents of God, that their power was not subject to limitation and that resistance to a divinely ordained ruler was a cardinal sin. If kings ruled tyrannically, it was because God was punishing humans for their wickedness.

Absolute monarchs built standing armies and removed the right of feudal nobility to wage war with their king. Support of the army was garnered through the power of the kings to tax their subjects without interference from representative assemblies. Autocratic kings conducted foreign affairs in accordance with their own ambitions and available resources. The reign of most absolutist kings was marked by continuous warfare.

The model of absolutism for all of Europe was King Louis XIV of France (r. 1643-1715). Six year old Louis XIV gained the throne of France in 1643 under the guidance of Cardinal Mazarin. Mazarin worked to enhance the authority of the boy-king by extending his power of taxation to finance the last years of the Thirty Years' War. When Mazarin died in 1661, Louis resolved to rule without benefit of a Prime Minister.

Louis proved to be industrious in administrations of the state. Unfortunately for France and Europe, he pursued glory and power for its own sake. His wars of aggression were financed through taxation of French peasants. Louis ingratiated the nobility of France to himself through the granting of special favors and the development of a palace court. In return for personal services exalting the monarchy, he granted pensions and made the nobles financially dependent on his favor. At Versailles, just outside of Paris, he built a huge palace staffed by nearly 15,000 servants. The palace served as a gathering place for all the nobility of France and as a model of French artistry.

Louis XIV lavished resources and attention on the French army. The army adopted improved artillery, bayonets, and faster-firing muzzle loading handguns; officers were dressed in uniforms and were given a serious military education. Marshal de Vauban devised scientific ways to defeat fortresses that was so precise he could predict the time of defeat. Nobles filled the officer corps; commoners were recruited or impressed into service as common soldiers. By 1678 Louis had a standing army of 279,000 men. Louis set out to expand French territory. He succeeded in claiming areas surrounding France.

Louis was also a lavish patron of the arts and sciences. His interests stimulated a movement toward institutionalized uniformity. The Academie Francaise was established in 1635; its Dictionary appeared in 1694 and served as the official guardian of the French language. The Academie de Peinture et de Sculpture (also known as the Beaux-Arts) empowered the King's painter, Charles Le Brun (1619-1690), to dictate French art and architecture. The Academie des Sciences (1666) pursued activities similar to the Royal

Society in London. The Academie de Musique (1669) served as a platform to popularize the music of the King's musician Jean-Baptist Lully (1633-1687).

As Louis came to his peak of power in Europe, his personal life and the tone of his court changed. Louis lost interest in his vivacious and conniving mistress, Madame de Montespan, and replaced her with a new mistress, Madame de Maintenon, governess of Louis' illegitimate children. Louis secretly married de Maintenon in 1684. Following the marriage, Louis was strongly influenced by the advice of the Jesuits; he adopted a more somber and religious nature. Comedy was banned at court; the atmosphere at Versailles became sober and rigid. Louis revoked the edict of toleration and elevated the persecution of Huguenots in the same year. Up to a million of France's citizens, many of who comprised the middle class, were forced to flee or submit to conversion.

By 1685 Louis' expansionist nature had once again alienated his allies. Between 1689-1697 Louis engaged in war with a coalition of German states, the Dutch Republic, Spain, Savoy, and England. In the English colonies of America, the War of the League of Augsburg (1689-1697) became known as King William's War (after King William of England). The league succeeded in turning back French expansion. At Ryswick in 1697 France signed a peace agreement that substantially restored the prewar boundaries.

With the death of King Charles II of Spain, France was once again drawn into war. Louis' grandson, Philip, was heir to the Spanish throne by edict of Charles II prior to his death. The war for Charles II's inheritance, (called Queen Anne's war in England's American colonies), spread overseas between 1701 and 1713. Weary of war, concerned about the impact of the war on commerce, and fearful of France's Austrian Hapsburg enemy, the Tory party in England negotiated a separate peace with France. Two treaties,

Utrecht (1713) and Rastatt (1714), known as the Peace of Utrecht, brought an end to the war. France was granted possession of some of her gains, including Lille, Franche-Comte, and Alsace. Louis' grandson Philip retained possession of Spain and her colonies on the condition that the French and Spanish thrones would never be joined. The Austrians, the Dutch, the house of Savoy, the Hohenzollern ruler of Prussia, and England all received concessions in the treaty. England was awarded the majority of the spoils of war, gaining control of Gibraltar, Minorca, Newfoundland, Acadia, St. Kitts, and Hudson Bay. British merchants were granted the right to limited trade in Spain's American colonies. The South Sea Company also obtained a monopoly of the Spanish colonial slave trade (Davies, 1996; Stipp, Dirrim, & Hollister, 1972).

JAKE: That's all interesting Minerva – but like you said – very little focus on science from the Middle Ages through the sixteenth century. And look at all the blood spilled in the name of religion.

MINERVA: Yes I know Jake, but without the challenge to church authority we might not have had the scientific revolution.

JAKE: You said that earlier, but I still don't see why.

MINERVA: I'll give you a little more detail, but basically, the rediscovery of the Greek texts during the Renaissance revealed interesting works in astronomy. While the Church was embroiled in conflict with Luther, Calvin, and various kings, there were a few scientists who pursued the study of astronomy. Several had their materials suppressed, but not totally destroyed. A few tried to explain new discoveries in accordance with Church dogma. And then the floodgates opened

once a few brave souls challenged all the paradigms of the Church and proposed a new model of the universe. It would have been impossible for this information to have spread prior to the printing press. But more importantly, the schism in the church weakened its power to control information. The church's inability to control the public perspective of the universe opened the door for a new paradigm to take hold about *how* the universe is structured. And even then, those in pursuit of science moved out of territories controlled by the Catholic Church once the Church placed Galileo under house arrest and banned his books.

JAKE: Hmmm...make sense now. So tell me how all that played out.

MINERVA: Well...

The Philosophical and Intellectual Roots of the Scientific Revolution

The scientific revolution began in the 1500s and has continued unabated to present day. The formative years between the early sixteenth century and the late eighteenth century brought sweeping change to western philosophy and to Europeans' views of their place in the world. The changes in sixteenth century Europe, however, are rooted in medieval history.

European artists began incorporating realism as early as the twelfth century. Sculptors accurately emulated human form and face. Painters adopted these techniques, creating perspective and depth within their paintings. Renaissance painters, like other intellectuals of their time, were fascinated by light. Architects and theologians had been interested in the nature of light since the twelfth century. In the fourteenth century, intellectuals began to explore the science of optics, inventing the first reading glasses.

Thomas Aquinas, in the twelfth century, argued that nature is structured in such a way as to reveal God; by the fourteenth century theologians and philosophers began to argue that nature did not necessarily reveal anything about the nature of God.

Nominalists, like Duns Scotus and William Ockham, argued that Christian faith is only obtained through revelation, thereby freeing the investigation of the natural world from the constraints of theology (Coffin, Stacey, Lerner, & Meacham, 2002).

Northern Renaissance humanists placed a low value on the pursuit of science because it seemed irrelevant in their pursuit of making people more eloquent and moral. Humanists such as Petrarch and Erasmus considered science part of vain scholasticism. Petrarch's criticism of scholasticism was its lack of Christian ethos. He felt that the dry rationality of scholasticism threatened the salvation of Christians. The humanists of the Renaissance period sought the inclusion of Christianity and the conception of a Christian God with the teachings of the ancient Greeks, to the exclusion of reason and the scientific method (Coffin, Stacey, Lerner, & Meacham, 2002; Haugeland, 2000; Stipp, Dirrim, & Hollister, 1972).

The prevailing Christian world-view in 1500, stemming from Aristotle and Ptolemy, held that a stationary earth occupied the center of the universe. The sun, moon, and stars were held in circular orbit around the earth by the 'prime mover', which Christians identified with as the Christian God. The heavens were perceived to exist in a perfect state; the earth (the City of Man) was affected by sin and therefore imperfect, operating under different laws. Physics, astronomy, and theology were integrated into a consistent cosmology. Thomas Aquinas argued that God structured the cosmos in such a way that a rational investigation of the natural world would lead to a conclusion as to the

existence of God. Faith offered a more secure method of reaching God, but human reason, as a divine gift from God, could also spur man toward salvation. A Christianized version of Aristotelian cosmology was taught in medieval universities for centuries with the caveat that theological truths overrode any conflict with natural observation (Stipp, Dirrim, & Hollister, 1972).

Italian humanism and philosophical inquiry led to rediscovery of the ancient Greek texts, encouraging the cultivation of reason and a growing fascination with the intricacies of the universe. The main contribution of Northern humanism to the scientific revolution was the reintroduction of Neoplatonism. It was Neoplatonic ideals that stimulated scientists to defy the prevailing world-view. The scientific revolution was largely the product of a melding of the scholastic tradition of the Italian humanists and medieval scholars with the Neoplatonic desire to find ideal and perfect structures in nature; all of which it was believed could be supported by mathematics.

During the fifteenth century, the world of theology and practical mechanics also merged. Highly respected artists, such as Leonardo da Vinci, bridged the worlds of theology and scholarly study with the everyday pursuits of more common craftsmen. Renaissance artists worked out geometric methods for supporting the weight of huge architectural domes, studied the details of the human body, worked with optics and light, and developed an interest in alchemy and astrology. Humanism also played a role in the exploration of the mechanistic nature of the universe. The rediscovery of Greek philosophical works dealing with mathematics and astronomy awakened an interest in the study of the universe and man's relationship to God in the universe. In effect, Renaissance humanists framed the questions for the scientific revolution and ushered in

liberation from tradition, cultivating a spirit of individualism and exploration (Botsford, 1936; Coffin, Stacey, Lerner, & Meacham, 2002; Kenny, 1998).

Inventions played a large role in breaking up the old order of the world.

Gunpowder, by rendering the feudal strongholds of the middle ages insecure, served as a powerful aid to the development of centralized monarchies. The printing press made possible the rapid spread of knowledge. The mariner's compass made possible long voyages at sea, culminating in the discovery of new worlds and new routes to old lands.

Between 1540 and 1660 Europeans were faced with a world that was changing rapidly. A new world had been discovered in America, populated by people whose very existence challenged European concepts of humanity and human nature. The religious uniformity of Europe was shattered. The power of the Church of Rome was destroyed in areas of northern Europe and replaced with other churches that were more or less closely aligned with political authority. From the thirteenth century on, monarchies were established that unified communities of people by race, language and history. Common religion was simply a bond between a king and his subjects. Europeans were plagued with religious wars.

By 1660 it was clear that Europeans would never again enjoy spiritual unity. Religious faith would no longer provide an adequate foundation for universal truths. The Protestant Reformation changed Europeans' perspective of power; political alliances and powers were being challenged. Adding to the fears was a conviction that witchcraft was a mortal and increasing threat to the world. In 1484 Pope Innocent VIII credited men and women who had abandoned themselves to the devil with atrocities that included "incantations, spells, conjurations and other accursed charms" (Davies, 1996, p. 437) in

order to slay infants in the womb and to destroy crops. The pope ordered papal inquisitors to use all means to detect and eliminate witchcraft, including torture of suspected witches. In 1486 the Dominicans published *Malleus Maleficarum*, a handbook for witch hunters. After that, witch-hunting was endemic to Europe for over 300 years.

Between 1580 and 1660 witch hunting reached a stage of mania. Tens of thousands of victims, three quarters of which were women, were executed. The total death count will probably never be known, but during the 1620s there was an average of one hundred burnings a year in the German cities of Wurzburg and Bamberg. After 1660 accusations of witchcraft gradually declined.

The witch craft mania of the sixteenth and seventeenth centuries reflects European fears of the devil as well as a sense that traditional religious remedies (such as amulets, prayers, and holy water) were inadequate to protect them. Church courts were forbidden to impose capital punishment, so Europeans turned to the state for protection. Witch hunting became a state-sponsored affair, carried out by secular authorities claiming to act as protectors of society. The result was an increase in the scope of the state's powers and responsibilities to regulate the lives of its subjects.

Europeans responded to this pervasive climate of doubt in a variety of ways. Responses ranged from the radical scepticism of Montaigne to the authoritarian assertions of religious leaders and political absolutism. There was, however, a common search for a new foundation upon which to reconstruct some measure of certainty about life. This search set the stage for the scientific revolution (Botsford, 1936; Coffin, Stacey, Lerner, & Meacham, 2002).

The Scientific Revolution of the Sixteenth Century

The foundation of the scientific revolution was the study of astronomy and mathematics. Throughout the Middle Ages, the Christian calendar was based on the astronomical calculations of the Alexandrian astronomer Ptolemy. During the late 1400s it was discovered that omissions and faulty mathematics marred Ptolemy's complex mathematical calculations. Due to errors in Ptolemy's calculations, a problem with the European calendar was becoming critical by the beginning of the sixteenth century. The old Roman calendar was seriously out of alignment with the movement of the heavenly bodies. The major saints' days, such as Easter, were off by more than a week from when they should be according to the stars. Catholic authorities worked on the problem for nearly a century trying to resolve the problem. Mathematicians and astronomers were summoned from all over Europe. One of these researchers was a Polish clergyman and university astronomer Nicholas Copernicus (1473-1543). Copernicus was appalled by Ptolemy's mathematics, which was convoluted and circuitous; as a devout Christian, Copernicus believed that a perfect God would create a perfect universe. In 1510 Copernicus deduced a new mathematical formula that placed the earth in orbit around the sun. If the position of the earth and sun were exchanged as the third orbit out from the center, the mathematical calculations became simpler, the orbits of the other planets made more sense, and the calendar was put right. However, disturbed by his own conclusions, which seemed to contradict the Bible, Copernicus resorted to other Greek astronomers to support his claim.

Copernicus was unable to explain the problems that the new model created, such as the movement of the earth at what would have to be high rates of speed, or how such

movement affected movement on earth. He continued to assume that the orbits were perfectly circular; the more he tried to explain, the more cumbersome his mathematics became. Copernicus failed to gain support from his contemporaries, who raised valid concerns about the unsolvable problems in the model.

Frustrated by the complications, Copernicus refused to publish his work. In 1543, the year of his death, he consented to publish his description of the universe, *On the Revolutions of the Heavenly Orbs*, dedicating it to Pope Paul III. In the book, Copernicus stated that his model was a reality. In order to protect him from scandal and possible charges of heresy, the publisher included an introduction, written by an anonymous Lutheran clergyman, describing Copernicus's conclusions as merely mathematical hypotheses. Regardless, Martin Luther condemned Copernicus as a fool who was attempting to overturn the science of astronomy. Roman Catholics rejected Copernicus' theses after philosopher Giordano Bruno was burned at the stake in 1600 as a heretic for asserting that the cosmos were sun-centered and filled with many inhabited worlds. In 1616 the Church added Copernicus's book to the *Index of Prohibited Books*, where it remained for over two centuries (Coffin, Stacey, Lerner, & Meacham, 2002; Haugeland, 2000; Stipp, Dirrim, & Hollister, 1972).

In 1543 the works of Greek mathematician and physicist Archimedes (c.290-212 BC) were published. Archimedes taught that the universe operated on the basis of mechanical forces. His observations and discoveries were among the most accurate and reliable of all Greek science. Archimedes taught a mechanistic view of the universe, in which the entire universe operated on the basis of mechanical forces, like a great machine (Coffin, Stacey, Lerner, & Meacham, 2002).

Tycho Brahe (1546-1601) developed a more theologically palatable explanation for the universe. Tycho, a high ranking Danish nobleman, was trained as an astronomer. He turned a small island on his estate into a giant laboratory, specially designed for observation. Without the use of telescopes, Tycho spent thirty years accumulating a mass of information on the motion of each object in the night sky, accurate to within the tiniest fraction of a degree. In 1572 a new star appeared in the sky, which, according to Aristotle, was impossible. Tycho also made observations of a comet in 1577, attempting to measure its distance from the Earth by comparing its position against distant stars. He concluded that the comet was beyond the moon, disproving Aristotle's position that comets were meteorological objects just above the clouds. Tycho was also convinced that the comet followed an elliptical path, meaning that it went crashing through the 'crystalline spheres' that were believed to carry the heavenly bodies.

Still, Tycho held to an Aristotelian view of the universe and did not accept a heliocentric version of the universe. He proposed a model in which the planets orbit the sun, and the whole system then orbits a stationary earth. The 'Tychonic' system allowed accurate astronomical and astrological predictions that the Ptolemaic system missed, while still avoiding the theological implications of the Copernican system (Burt, 2003; Coffin, Stacey, Lerner, & Meacham, 2002; Farah & Karls, 1997; Stipp, Dirrim, & Hollister, 1972; Tallack, 2001).

William Gilbert (1544-1603), an English physician with an interest in science, added another crucial bit of information to the body of knowledge that would eventually discredit the fixed and long-standing Aristotelian worldview. He was fascinated by lodestone, a mineral that possesses natural magnetism. He studied all types of lodestone

in various shapes and powers of magnetism. For centuries, it was common knowledge that magnetic rods align themselves in the same direction on the earth's surface, pointing north and south. Thirteenth century sailors used floating magnetic needles as an early form of compass. The explanation for the behavior of a magnetic needle was based on an Aristotelian model of the universe, in which benign and malignant forces emanated to shape human lives, including magnetism; the magnets aligned themselves with the poles of the earth as if governed by the heavens.

Gilbert's observations led him to the conclusion that the earth itself is a giant lodestone. At the time of his research, England was Protestant and Gilbert was supported by Protestant Queen Elizabeth I. He was therefore able to publish his findings in his book *De Magnete* (1600). He argued for Copernicus's heliocentric version of the solar system and proposed that the fixed stars in the heavens were of varied distance from the earth. He also proposed that the planets were held in orbit by some kind of magnetism. His proposition of the earth's magnetic force served to refute the dominant Aristotelian view and demonstrated that the earth, not the heavens, was the source of power (Tallack, 2001; Van doren, 1991).

In his later years Tycho moved his work and tables of data to Prague, where he became court astronomer to the Holy Roman Emperor. One of Tycho's assistants in Prague was a young mathematician by the name of Johannes Kepler (1571-1630). Kepler, born in Wurttemberg, Germany, received an excellent education in Lutheran schools and at the University of Tübingen. He aspired to a career in the church, but one of his papers on astronomy came to the attention of Tycho Brahe, who recruited him in 1600 as his

assistant. When Tycho died the following year, Kepler was appointed imperial mathematician in his place, inheriting all of Tycho's astronomical observations.

In reviewing Tycho's data, Kepler became convinced that it supported a heliocentric solar system. Kepler aligned the mathematics of Copernicus with his own interests in mysticism and astrology. Kepler, in line with the ancient Greeks, believed all of creation was designed according to mathematical laws; he believed that understanding those laws would provide an understanding of God and lead to the discovery of the inner workings of the universe.

Kepler searched for a pattern of mathematics in the movement of the cosmos, rejecting any of his mathematical models that disagreed with Tycho's observations. Moving through Tycho's empirical data, Kepler searched for musical harmonies, 'nested' geometric shapes inside the planet's orbits, and numeric formulas. Using mathematics, Kepler was able to refute two of Copernicus's hypotheses (which were all based on observation). He did, however, prove that the sun is stationary and that the planets move in elliptical (not circular) paths around the sun (his First Law). He also discovered that the speed with which the planets moved through their orbit varied, moving faster as they approach the sun and slower as they move away from it (his Second Law). Kepler also argued that magnetic attraction between the sun and planets created the orbital motion, concurring with Gilbert's speculations about the earth as a magnet, but he failed to understand the cause of planetary movement. He was unable to discard one critical Aristotelian assumption – that of inertial rest. He assumed that a force was required to keep the planets in motion. His inability to discard all of his own preconceived notions impaired his ability to produce the science that later defined Isaac Newton as one of the

greatest scientists of all time. He thought the planets would stop moving unless something kept pushing them. He could not conceive of anything that could create this movement other than Gilbert's magnetic force. Neither assumption was correct.

Kepler published three books, *Astronomia Nova* (1609), *De Harmonica Mundi* (1619), and his *Rudolphine Tables* (1627). The *Tables* were the first modern astronomical tables built using the newly invented logarithms of John Napier. The tables allowed astronomers to predict the positions of the six known planets at any time in the past, present, or future. The accuracy of the tables brought Kepler a great deal of fame within his lifetime. However, Kepler's research on planetary motion was rejected by most of his contemporaries as being too magical (Burt, 2003; Coffin, Stacey, Lerner, & Meacham, 2002; Farah & Karls, 1997; Stipp, Dirrim, & Hollister, 1972; Tallack, 2001).

Unlike Tycho, Gilbert, and Kepler – Galileo Galilei (1564-1642) was a Roman Catholic and lived in Catholic Italy. He studied at Pisa and taught mathematics at the University of Padua in northern Italy. By the early 1600s Galileo was working on the problem of motion, especially the motion of objects on a moving earth. Galileo did not agree with Aristotle's explanations of motion and worked on a new theory, applying mathematics to the problem of motion. He believed that philosophy was written in the universe and the ability to read it was based in mathematics. Galileo used geometry to represent abstract concepts such as motion and velocity.

In 1609 Galileo's life changed dramatically when he heard that two Dutch eyeglass makers had discovered that distant objects could be greatly magnified by looking through two lenses held together in a certain way. Being technically skilled, with a gift for improvisation, Galileo immediately went to work making his own telescope. By

August of 1609 he made a telescope that magnified objects eight times; by the end of the year he improved it to twenty times. In December 1609 Galileo discovered the mountains on the moon, measured some of their heights, and showed the craters of the moon to be features of the landscape rather than shadows. By mid-January 1610 he discovered four satellites circling Jupiter, and named them the Medicean Stars in honor of Grand Duke Cosimo of Tuscany, a member of the Medici family. He observed sunspots, drew sketches and documented that the sun, instead of being a symbol of perfection as proposed by Aristotle, was spotted, covered with irregularities, and rotates once every twenty-five days. Turning his telescope to toward the Milky Way, he discovered it is filled with distant stars.

Galileo quickly published his findings in 1610 in his book *Sidereus Nuncius* (Starry Messenger). The book immediately made him famous. His university offered him a permanent position and a raise. The Grand Duke of Tuscany offered him the position of court philosopher and mathematician. Galileo opted for employment with the Duke, allowing him to pursue his work on astronomy and motion, including his conviction that Copernicus' model of the universe was correct.

Galileo's theorems and the accompanying proofs were revolutionary and, while popular, his publication also stirred a heated exchange of insults hurled between him and his detractors. His findings partly confirmed that Copernicus and Kepler were right. Many astronomers agreed with Galileo. The Jesuit astronomers of the day argued that Galileo's observations fit perfectly well with Tycho's system of an earth-centered solar system. Not one to shirk from a good fight, Galileo championed the Copernican system. Angry Churchmen lashed back, seeing Copernicanism as a direct threat to church

doctrine. Cardinal Robert Bellarmine (1542-1621), an influential Jesuit and mathematician, as well as a critic of Copernican ideas, was asked to caution Galileo about pursuing his ideas too far. Bellarmine warned Galileo that it was all right to hypothesize about a sun-centered solar system; it was not, however, prudent to state it as a fact. Galileo responded by writing his *Letter to the Grand Duchess Christina di Medici* (1615), in which he explained his convictions regarding religion and science. He believed there was no discord between science and God. He believed that discussions of

physical problems ...ought to begin not from the authority of scriptural passages, but from sense-experiences and necessary demonstrations; for the holy Bible and the phenomena of nature proceed alike from the divine Word, the former as the dictate of the Holy Ghost and the latter as the observant executrix of God's commands. It is necessary for the Bible, in order to be accommodated to the understanding of every man, to speak many things which appear to differ from the absolute truth so far as the bare meaning of the words is concerned. But Nature, on the other hand, is inexorable and immutable; she never transgresses the laws imposed upon her, or cares a whit whether her abstruse reasons and methods of operation are understandable to men. For that reason it appears that nothing physical which sense-experience sets before our eyes, or which necessary demonstrations prove to us, ought to be called in questions (much less condemned) upon the testimony of biblical passages which may have some different meaning beneath their words. Galileo (as cited by Coffin, Stacey, Lerner, & Meacham, 2002, p. 636).

Galileo was as sincere a Catholic as he was a dedicated Copernican. He believed that the Church's denial of the new science and the observable universe adversely affected its authority. He sought a partnership between the Church and natural philosophy in finding and proving the truth of God's creation. Galileo felt that the natural philosopher who worked with observable data and produced mathematical models to explain the data was better equipped to explain the visible world than the university philosopher. The Church's role, in his estimation, was the saving of souls; it was his to explain how God set up the operation of the universe.

Galileo's argument was well received, impressing his Medici patrons, especially the Medici ally Cardinal Maffeo Barberini, who was also a close friend of Galileo. Unfortunately, Galileo's friends and patrons were not able to withstand the influence and power of the Catholic Church. In 1616, after Copernicus's book was placed on *the Index of Prohibited Books*, Galileo's friends and critics recommended that he forego his Copernican ideas and limit his ambition.

Galileo continued his work and kept his opinions to himself over the next decade. In the 1620s it appeared that the political climate was changing. Cardinal Bellarmine and several other critics were dead. Galileo's old friend Barberini became Pope Urban VIII. Galileo decided to push his ideas in a new format and wrote a 'dialogue' between supporters of the old and new sciences. Prior to publication, Church authorities edited the book for content and suggested the title *A Dialogue on the Two Great Systems of the World* and permitted its publication in 1632. In the book Galileo's opponents won the debate, but through the course of dialogue Galileo made a thorough case for Copernicanism. The book was an international success and in so being, created a scandal within the Church. Despite Church approval, Galileo was accused of mocking the Church by positioning one of the supporters of the old system as a pious, stupid old fool. Barberini took offense and separated himself from Galileo, turning him over to the mercy of the Inquisitors.

Galileo was summoned to Rome to answer charges of heresy. The trial of Galileo was an international affair. Galileo was the most famous natural philosopher of his day. Facing threats of death and excommunication, Galileo recanted his belief in Copernican ideas. The *Dialogue* was declared forbidden for anyone to read; Galileo was banned from

working on or even discussing his ideas with anyone. He was placed under house arrest for the rest of his life. As he left his trial, it is claimed that he muttered ‘Eppur si muove’ (But it moves, just the same).

While under house arrest, Galileo continued his experiments and refined his ideas about motion. His physics, describing a moving earth, were written up as *The Two New Sciences* (1638), and was smuggled out of Italy and published in Protestant Holland. His ‘new sciences’ were startling because they seemed to clash with everyday observation. Aristotle had taught that heavy objects fall faster than lighter objects. Galileo demonstrated that this was erroneous. His experiments tested and proved his theory that in a vacuum all falling objects accelerate at the same rate, regardless of weight. Air resistance and sources of friction were the sole source of differences in the rate of acceleration of falling objects. He went on to theorize that any body moving on a horizontal plane will continue at the same rate of speed in the absence of resistance – destroying Aristotle’s problem of inertial rest (Burt, 2003; Coffin, Stacey, Lerner, & Meacham, 2002; Davis, 1997; Davis, 2004; Haugeland, 2000; Tallack, 2001).

Galileo combined mathematics and experimentation to create a new physics. As his fame spread he aroused intense opposition among universities. Scholars who had devoted their lives to the study of nature in an Aristotelian framework rejected his conclusions; many refused to look through his telescope. The publicity of his trial forced the development of the new science to move north, out of the control of the Catholic Church.

Rene Descartes (1596-1650), a contemporary of Francis Bacon (1561-1626) and Galileo Galilei, is also credited with creating and advancing the concept of the scientific

method. Like Descartes, most of the philosophers and scientists of the seventeenth century held a sincere belief in the tenets of religion, and yet they worked independently of its intellectual constraints, confident that their findings would reveal truth that would confirm the existence of God. Although Descartes held a deep Catholic faith, his writings did more to undermine the Catholic Church than any other writer or philosopher (Scruton, 1995; Van Doren, 1991).

Born in France, Descartes was educated by the Jesuits, including an exhaustive study of Aristotelian logic and physical science; he remained a Catholic throughout his life. Despite his Catholic beliefs, Descartes chose to live most of his life in Protestant Holland. As a man of means, Descartes lived a life of leisure; he never lectured in a university and commonly wrote for the general reader, not in academic Latin, but in everyday French.

Descartes served in the Emperor's army during the Thirty-Year war between the Catholic Holy Roman Emperor Ferdinand II and the German Protestant princes. It was during his service in 1619 that he conceived the idea of reforming human learning and displaying all disciplines as branches of a single science. In his sleep one night he had a series of dreams that set his course and which he claimed were prophetic. Determined to realize his goal, Descartes became an innovator in many disciplines. He created analytical geometry; the Cartesian co-ordinates that enable arithmetical and geometrical methods to be combined are named in honor of him (his Latin surname being Cartesius). He researched and conducted experiments about the nature of the eye and light. He studied meteorology and theorized on the nature of rainbows. He wrote a treatise titled *The World*, providing an account of the origin and nature of the universe and the working of

the human body. Like Galileo, he adopted the Copernican version of the solar system; when he heard of Galileo's condemnation he decided against publication of his research and kept his heliocentric views to himself (Kenny, 1998).

Descartes gave only a subordinate role to experimentation and a far more elevated role to metaphysical speculation. He attempted to deduce the whole nature of the universe from the nature of God using geometrical reasoning. He considered any science that derived its theorems from mere evidence of the senses as inferior. Only science based in reason and the perfection of mathematics was acceptable. Descartes argued that there were fundamental physical laws that explained all of the sense experience and that were so abstract that they could only be determined by *a priori* reflection (Scruton, 1995).

Descartes questioned everything and rejected Aristotelian teleology, yet he was Aristotelian in his use of reason as a basis of knowledge. In 1637 Descartes published *The Discourse on Method*. In this short twenty-five-page book, Descartes recounted his intellectual development, including doubts about the existence of all things. He also developed his proof that he lived because he doubted, and argued the ability to achieve certainty about the existence of things in other realms based on mathematics. Descartes even used his mathematical reasoning to prove the existence of God. *The Discourse* is an excellent example of Descartes' ability to present complicated philosophical doctrines in an easily read and digestible format. He wrote in a narrative style that was intelligible for the novice, yet still provided content that challenged the educated (Kenny, 1998; Oldroyd, 1986; Van Doren, 1991).

Descartes' reasoning transformed all scientific fields as well as philosophy. His method required ridding one's mind of all preconceptions, reducing the problem to

mathematical form (employing the least number of axioms to shape it), then using analytic geometry (invented by Descartes) and algebraic rules to solve the resulting equation in order to obtain the knowledge being sought. Descartes admitted that human beings aren't mathematical equations, but it was appropriate for most inquiries to describe them as such. Descartes did consider animals and all of creation other than man to be machines because they lacked souls.

Descartes turned the world upside down. Prior to his theories, the realms of science, theology, and philosophy were inextricably intertwined, with theology framing the world-view. Following Descartes, the material world was separated from theology and philosophy and reduced to mathematical form. For Descartes, a human being is a thinking substance, separate of matter. He rejected the Aristotelian philosophy that the soul was a form of the body, for if that were the case then disembodied existence was incomplete in the absence of a physical form. For Aristotle, man was a rational animal. For Descartes, man's whole essence is mind, separate of the material substance of the body. In *The Discourse* he says

I attentively examined what I was, and as I observed that I could suppose that I had no body, and that there was no world nor any place in which I might be; but that I could not therefore suppose that I was not; and that, on the contrary, from the very circumstance that I thought no doubt of the truth of other things, it most clearly and certainly followed that I was; while, on the other hand, if I had only ceased to think, although all the other objects which I had ever imagined had been in reality existent, I would have had no reason to believe that I existed; I thence concluded that I was a substance whose whole essence or nature consists only in thinking, and which, that it may exist, has need of no place, nor is dependent on any material thing; so that "I", that is to say, the mind by which I am what I am, is wholly distinct from the body, and is even more easily known than the latter, and is such, that although the latter were not, it would still continue to be all that is (Descartes, 2003).

Descartes agreed that in life the human mind is united with the body, but it is not the body that makes us who we are. Descartes conceived of the mind in a new way – the essence of the human mind is not intelligence, it is consciousness, the awareness of one's own thoughts and the objects of thought. Matter is simply extension in motion, the objects that have geometrical properties (Davies, 1996; Sedgwick, 2001; Sorell, 1993; Van Doren, 1991).

Descartes made an immediate and significant impact on philosophy in his own time. While he feared and respected the censure of the Church, he was a proponent of reason. This set him apart from the scholastic traditions and from the worldly musings of the Renaissance humanists. For Descartes, all previous speculation had to be set aside in favor of clear principles derived by the use of reason. The lucidity of his writing style, and the persuasive presentation of his philosophy, made it impossible to resist the appeal of his writing. Many of his contemporaries felt compelled to respond to Descartes, either directly, or through Father Marin Mersenne (1588-1648). Mersenne acted as a go-between among the scientists and philosophers of his day, achieving for France what the Royal Society would later achieve for England (Scruton, 1995).

The separation of metaphysics from the material world, referred to as Cartesian dualism, now formed the foundation of scientific inquiry. Religion, metaphysics, and the concept of the mind were relegated to a separate realm of study. Descartes' deductive approach, which was based on speculation and confirmed by experimentation, contributed greatly to the authority of mathematics as a tool for the natural philosopher. His view also provided the logic applied by scientists for a purely mechanistic view of the natural world. In the seventeenth century, debates ensued in which mechanists argued

that all of creation, except humans, existed solely in terms of physical laws; with each entity operating as a machine under the force of the original motion placed in the universe by God. The difference between animal and human was the presence of a thinking, reasoning mind. Nature could now be examined objectively, leaving aside the question of meaning. The material world did not encroach on the inner spiritual world. Creation could now be viewed as a conglomeration of machines, all interacting with one another. Under this model, scientists were free to examine the mechanism and determine what made it run (Coffin, Stacey, Lerner, & Meacham, 2002).

As might be supposed, English natural philosophers followed the theories of Bacon; French and northern European scientists followed Cartesian methodology. Both groups held a strongly mechanistic view of the world, but went about discovery using two distinct methods. Baconian philosophers concentrated on experimentation in many fields, which offered concrete but controversial results. Cartesian philosophers approached their work on the basis of mathematics and philosophical theory (Coffin, Stacey, Lerner, & Meacham, 2002).

ACT TWO

Scene 4

JAKE: Thanks Minerva -- that was quite interesting. I have obviously studied science, but I was always under the impression that one theory built upon the next in a logical sequence of events. I actually thought early scientists were looking for *why* things work the way they do, not *how* they work. It is like they almost stumbled on their discoveries by accident. I hadn't really thought about how our perspective

influences how we interpret what we observe (*nodding his head slowly*)

...Interesting.

MINERVA: Can you imagine then, how the new discoveries affected philosophy?

BILL: Do you mean as in religion and metaphysics?

MINERVA: Actually, all of philosophy. Think about it, Bill. If we interpret data through our filters, which are our belief systems, then how does a change in what we believe affect our philosophy, and therefore the questions we ask?

TONI: Do mean, like, whether I believe in evolution or creation?

MINERVA: Or both?

LINDA: I believe in both.

MINERVA: Why?

LINDA: I...don't know...I guess because it seems to make sense to me and resolves both problems. I can believe in God and still believe in science.

MINERVA: So...is that because someone else told you it works, or because *you* worked it out.

LINDA: (*long pause*)...I guess I can't claim I worked it out on my own.

ADAM: Well, I agree with Linda and I did work it out. I believe in God, although I can't explain why, but I think He could have created everything over a long time through evolution. Why do the two have to conflict?

MINERVA: I don't claim to have your answer, Adam. I am just challenging you to find the answers through critical inquiry and personal search rather than because someone else says it is so – otherwise you are subject to believe the next 'fad' that comes along.

BILL: Good point, Minerva. I couldn't agree more. I can work with a Christian, and I can even counsel an atheist. The challenge is the person who just doesn't care and isn't interested in confronting issues on their own.

MARY ANN: Ok, you guys, I think we're off the topic, and I for one, am uncomfortable. Can we go back to science, 'cause I'm with Jake on this one – science is a lot cleaner than religion.

MINERVA: I tell you what, Mary Ann – let's take a look at how the science of Descartes and Bacon changed the world and created a new sense of division – metaphysics gets *really* complicated once we throw in a little science...

Seventeenth Century Continental Philosophy (Cartesian System)

The Cartesians made a number of contributions to natural philosophy. Their approach involved the application of mathematics and philosophical theory as a means to explain the mechanistic processes apparent in the world. Dutchman Christian Huygens (1629-1695) combined mathematical proofs and experiments to address problems of orbital motion. Blaise Pascal (1623-1662), through theorizing and experiments with new barometric equipment, demonstrated the probability of a vacuum above the level of the earth's atmosphere (1647-1648). Pascal also worked on probability theory, setting a foundation for game theory, and invented a calculating machine. He eventually turned his mathematical skills to theology following a religious conversion in 1654 (Coffin, Stacey, Lerner, & Meacham, 2002; Kenny, 1998).

In 1662 two theologians, Antoine Arnauld (1612-1694) and Pierre Nicole (1625-1695) anonymously published a text book of logic and method for the use of students at

Port-Royal College in Paris; the text was titled *Port-Royal Logic*. The text presents an interesting blend of Aristotelianism and Cartesianism as a means to demonstrate the falsity of scepticism. The authors did a superb job of presenting the philosophical thought of the period; as a result the book became widely used and highly influential.

Arnauld and Nicole were both members of the Port-Royal movement, which included Blaise Pascal. The movement arose partly in opposition to Cartesian philosophy and yet incorporated parts of the Cartesian system. The Port-Royal movement supported Jansenism. Cornelius Jansen (1585-1638) was a bishop of Ypres; his philosophy exalted faith over reason as a guide to theological and metaphysical truth. The objection that Arnauld held against the Cartesian system was that Descartes' proof for the existence of God appeared to him to be circular. He claimed that the absolute method proposed by Descartes presupposed that the *cogito* was absolute and free of Cartesian doubt. However, Cartesian skepticism about the validity of previous knowledge also cast the absolute existence of the *cogito* into doubt. Arnauld's means of reconciling what he felt was an apparent conflict in Descartes' logic was the application of faith in God as the source of innate ideas (Oldroyd, 1986; Scruton, 1995)

Port-Royal Logic revived the system of logic based on straightforward thinking and debate. Arnauld and Nicole reaffirmed the Aristotelian approach to scientific knowledge and the logic of syllogism. However, there were some distinctive seventeenth-century modifications to ancient doctrine. A well-known premise of medieval Aristotelianism was that nothing is in the mind but what is first carried in by the senses. Arnauld and Nicole, following Descartes, disagreed with the age-old logic. They presented the *cogito* as proof of an innate idea. The authors also presented a discussion on

‘modes’, ‘substances’, and ‘relations’ that appear to have affected subsequent discussions by Englishman John Locke. They argued that modes could not exist separate of substance, which was a self-subsistent thing. Substance could be modified or have a particular quality. They argued that one could not conceive of the mode ‘roundness’ without conceiving its relations to the substance of which it was made.

Arnauld and Nicole also included a section on the subject of signs and the things they signify. They described words as the signs of thought. Their presentation formed the basis of French thinking in the eighteenth century related to linguistic theory – language was a means to logical thinking. There was also a section of the text dedicated to the rules of Aristotelian logic. The section devoted to method presented a discussion on analysis and synthesis in which they used the cogito as an argument to prove the immortality of the soul. It is interesting to note that a seventeenth century book on logic incorporated the age-old and on-going argument for the existence of the soul, still based in an assumed presence of God (Oldroyd, 1986).

Baruch Spinoza (1632-1677), a Dutch Cartesian of Jewish heritage and education, rejected a number of Jewish doctrines and worked on the relationship between Cartesian philosophy and the God of the Hebrews. Like other Spanish and Portuguese Jews, Spinoza’s family fled to Amsterdam to escape the Spanish Inquisition. Not all Dutch cities accepted Jews, and even in Amsterdam they were required to declare their faithfulness to the laws of Moses and in the belief in God and of a future life. In Spinoza’s time, the city of Amsterdam had approximately 180,000 inhabitants, 5,000 of which were Jews.

The Jewish community's religious, civil, and economic life were governed by an elected council of six men, who in turn appointed the rabbis. The council was responsible for the conduct of all Jews within the community and took measures to assure that no Jew offended any Christian philosophy. Christians, especially followers of Calvin, believed that unbelieving Jews would undermine Christianity. Rules by the council were enforced through fines and excommunication. Excommunication was typically revoked when the offending Jew made a public declaration of repentance. In 1656, at the age of twenty-four, Spinoza was excommunicated, never to return to the Jewish fold.

Ostracized by the Jewish community, Spinoza became friendly with several Christian groups, including Quakers, Mennonites, and Collegiants. His *Tractatus Theologico-Politicus*, published anonymously in 1670, created a scandal throughout Europe. In *Tractatus* Spinoza called for philosophical freedom and labeled all religion as a system of superstition based on fear and greed. Spinoza ridiculed religion for its belief in miracles, for its separation of reason and faith, and for its subjection to the laws of the state. He advocated rejection of Biblical truths in favor of universal divine laws of justice, charity, decency, and morality (Scharfstein, 1998).

Spinoza applied geometry to ethics and believed he proved that God and creation are all one single substance. As a unified system, nature contains within itself the explanation of all of itself. Extending this line of thought – everything that happens is determined; there is no chance for any outcome other than the one that takes place. Despite this pre-determination, Spinoza claimed that God is free and humans have a degree of freedom – God determines all the rest of creation. Human beings, however, never have absolute power over themselves. The laws of nature, which are ubiquitous and

always the same, apply to human emotion. The emotions depend on causes, which are also the source of understanding emotions.

Spinoza taught that everything exists within a single being; human bondage is the result of slavery to our passions, human freedom is liberation by intellect. Liberation therefore, requires a consciousness of the underlying causes of our choices. The causes of our choices are based in the emotions, which are the result of the fundamental feelings of fear, pain, and pleasure.

Spinoza described emotions as either passive or active. Fear and anger, for example, are passive emotions generated by external forces. Once we are aware of a passive emotion it becomes active. This awareness provides the path to liberation. With awareness a human being can control the emotion using intellect. Negative emotions are countered by a stronger positive emotion. Hatred, which is evil, is not overcome by a return of hatred, but by love. Once the cause of emotion is identified, then the external cause can be destroyed. If an emotion, an affect, is not attributable to external causes then, through reason, it is a clear and distinct idea, separated from the external cause. Once the mind understands that all of nature is necessary and predestined, then the mind has more control and the external environment exerts less control over human affect. The mind is now free to intellectually understand and love God without expecting God to love in return.

Spinoza rejected the idea of a personal God and immortality of the soul. God's love of man is an intellectual love that is an expression of His self-love through thought. The soul and body are inseparable; the human mind is part of the body and only exists while the body is alive. According to Spinoza the striving of the mind parallels the

striving of the body to remain in existence; therefore, any thing that increases or diminishes a body's power to act also increases or diminishes the mind's power to think effectively. Joy is the affect displayed when greater perfection is achieved; sadness is the affect seen when perfection is diminished. The human striving to exist is stronger when it arises from joy. Therefore, reason, which aligns with nature, demands that all persons should love themselves, just as God loves Himself. For Spinoza this means that everyone should seek their own advantage and operate within their own nature. When acting from one's own nature, people will necessarily desire that which is good, which increases one's ability to be, to act, to live, and to actually exist.

Spinoza claimed that human beings disagree on what is good only insofar as they lack knowledge and are plagued with negative emotions. To the extent that they are guided by reason, human beings will always agree among themselves. Given this premise, then humans are of most use to one another and live in peaceful accord when they act in the most reasonably selfish way. Acting selfishly will cause humans to seek joy and avoid sadness. Hate leads to sadness and must be overcome by love. Pity, which is a form of sadness, is useless. Self-esteem, if it arises out of reason, is a source of joy and increases one's power to act; conversely, humility, as an act of self-deprecation, is a source of sadness and hinders one's ability to act and should be avoided. Repentance, which is the evil of sadness followed by an evil desire, does not arise from reason. The elimination of negative desires and emotions through the use of reason is the source of joy and personal power (Coffin, Stacey, Lerner, & Meacham, 2002; Kenny, 1998; Scharfstein, 1998).

Spinoza's philosophical radicalism and his resolve made him an underground hero to the more radical European thinkers. Even those who denounced his philosophy revered him. His philosophy was based on a rationalist theory of knowledge combined with a Cartesian notion of substance. Like Descartes, he regarded the pursuit of certainty as the only appropriate basis of human knowledge. However, unlike Descartes, Spinoza did not found his system in the single premise of cognition, or 'I think'. Spinoza's greatest distinction was his examination of the notion of substance. The self-orientation of Descartes' philosophy was too limiting to meet Spinoza's concept of knowledge. Spinoza agreed with the metaphysical foundations of Cartesian philosophy and believed that if the metaphysics collapsed, then so did the possibility of science. With this in mind, Spinoza's main aim was to provide support for Cartesian metaphysics; in so doing he developed a philosophy that negates Descartes' first-person viewpoint. The individual is subsumed into the single substance of God (Scruton, 1995).

A contemporary of Spinoza, Nicolas Malebranche (1638-1715), took a stand in the middle between Spinoza and Descartes. Born in Paris in 1638, Malebranche became a priest of the order of the Oratory in 1664, producing a series of philosophical and theological treatises. Malebranche accepted Descartes' philosophy, but rejected his teaching on the interaction between mind and body. He believed that God was the only true cause of anything, including movement within the human body. The human mind (will) is incapable of moving matter; there is no interaction between body and mind. Even the sensation of pain is not a result of an object, but of God causing the pain. All things are seen in God – He is the environment in which minds live, just as space is the environment in which bodies live. For Malebranche, there is no such thing as empirical

knowledge of the material world; its existence is a revelation by God, provided to humanity in the Bible. Like Descartes (and unlike Spinoza), Malebranche accepted the existence of substances, both material and mental; like Spinoza (and unlike Descartes), he thought the relationship between the mind and God, and God and matter, are much closer than the mind's relationship to matter (Kenny, 1998).

Malebranche believed that the union of the human mind with God is immediate, direct, and necessary. God provides revelation and it is by God's power that bodies receive all their modifications and the human mind all of its wisdom and ideas. Malebranche insisted that our perceptions of the material world are inaccurate; therefore experimentation based on sensory observation does not provide accurate knowledge. He concluded that there are in fact bodies external to us, but it is also evident that what really exists is not external. The body that we inhabit is both real and yet does not exist separate from the mind of God (Scharfstein, 1998).

English Philosophy and Science in the Seventeenth Century

While the Cartesians contributed to the objectivity of natural philosophy through the application of deductive reasoning, English philosophers and scientists pursued the same goal through experimentation and observation. English experimenters worked on practical research, putting the alchemist's laboratory to new uses. The English developed empirical laws, which were general conclusions based on evidence, rather than development of statements about the working of the universe. English scientists destroyed Descartes' philosophy of nature, but many of the English philosophers continued to accept his dualism of matter and mind. Newton's physics definitely established that Descartes geometrical method could not prove the propositions of

physics; proof required the combination of geometrical method and the experimental method. However, without Descartes' physics, Newtonian physics would not have been possible (Coffin, Stacey, Lerner & Meacham, 2002; Scruton, 1995).

Francis Bacon (1561-1626) an English statesman, philosopher, and ardent supporter of scientific inquiry, promoted the concept of science based on empirical and inductive principles. Bacon's primary career choice was as a politician. Although, as history attests, Bacon was a vainglorious and deceitful politician, he proved to hold a dedication to science. Bacon called for a new science that would establish man's dominion over nature. Bacon, although not himself a scientist, predicted that the universe could be transformed through the formation of scientific societies for cooperative research (Green, 1886; Kenny, 1998; Stipp, Dirrim, & Hollister, 1972).

While serving as Solicitor-General he wrote his first major philosophical writing, *The Advancement of Learning* (1605), in which he classified all possible sciences. By 1618 he was Lord Chancellor. In 1620 he published *Novum Organum*. In *Novum Organum* he condemned those who hazard a claim to complete knowledge of Nature and advocated a new method

They who have presumed to dogmatize on Nature, as on some well-investigated subject, either from self-conceit or arrogance, and in the professorial style, have inflicted the greatest injury on philosophy and learning. For they have tended to stifle and interrupt inquiry exactly in proportion as they have prevailed in bringing others to their opinion; and their own activity has not counterbalanced the mischief they have occasioned by corrupting and destroying that of others...They have not, however, derived their opinion from true sources...But the more ancient Greeks (whose writings have perished) held a more prudent mean, between the arrogance of dogmatism, and the despair of scepticism...Yet they themselves, by only employing the power of the understanding, have not adopted a fixed rule, but have laid their whole stress upon intense meditation, and a continual exercise and perpetual agitation of the mind.

Our method, though difficult in its operation, is easily explained. It consists in determining the degrees of certainty, whilst we, as it were, restore the senses to their former rank, but generally reject that operation of the mind which follows close upon the senses, and open and establish a new and certain course for the mind from the first actual perceptions of the senses themselves (Bacon, 2003, p. 224-225).

Bacon claimed that over the course of time, logic had become corrupted by the senses, and that corruption only served to validate the errors in logic rather than disclose truth. He advocated starting over, cleansing the mind of preconceived logic, and creating a mechanical aid (the scientific method) to discover truth. He claimed that men had to disentangle science from theology for the mutual benefit of both. He denied that the world belonged to Satan and was instead a second Scripture, the study of which would reinforce religion (Green, 1886; Kenny, 1998; Stipp, Dirrim, & Hollister, 1972).

In 1621, subject to Parliamentary inquiry, Bacon pled guilty to charges of bribery. He was exiled from court and temporarily imprisoned. He died in 1626 of a cold caught while studying the effects of cold in preventing the spoilage of meat (Green, 1886; Kenny, 1998).

Bacon was instrumental in propagating the replacement of Aristotelian views of the world with views based on the empirical method. Bacon dismissed the notion that the ancients understood all there was to know (and which simply needed to be rediscovered) and promoted the idea that new things could be known and applied to practical life. He abandoned the pervasive model of deductive reasoning established by Aristotle in favor of a procedure of hypothesis testing. If an experiment confirmed the facts, the hypothesis was deemed to be true.

Bacon divided the mind between memory, imagination, and reason, each with a field of learning – history, poesy, and philosophy. History included civil and natural history. Poesy included prose fiction and poetry. Philosophy itself fell into three divisions: divine philosophy, natural philosophy, and human philosophy. He championed natural rather than moral philosophy, and his arguments were commonly used in the following centuries to support a variety of philosophical views (Ladyman, 2002; Martin, 1993).

Bacon lived and wrote without knowing about the works of Galileo, having died in 1626 prior to the publication of Galileo's *Dialogue on the Two Great Systems of the World* in 1632. Bacon's contemporary, Thomas Hobbes (1588-1679), did learn about the works of Galileo. In fact, he knew or corresponded with almost every great mind of his time, including Galileo, Descartes, Bacon, and Leibniz. Hobbes' reactions to the English civil war and his pessimistic view of human nature led him to become a forceful advocate for unrestrained state power (absolutism).

Hobbes developed a mechanistic science that formed the basis for a materialist philosophy. For Hobbes, only matter and motion were real; the senses were the means by which all knowledge was transferred to the mind. Believing that he had destroyed the Platonic concept of transcendental knowledge, Hobbes argued that it was only language that separated men and beasts (Stipp, Dirrim, & Hollister, 1972).

Hobbes was a staunch nominalist. Universal names did not represent any thing in the world or idea in the mind; only names were universal, everything else was individual and singular. Sentences are names joined together. One who seeks truth must be careful of the names used and avoid the use of empty names or insignificant sounds. He accused

philosophers of stringing together incoherent sounds into sentences and confounding the truth. Hobbes denied the existence of the Cartesian concept of the mind. His materialism relegated the mind to a type of matter, no more and no less.

Hobbes described two kinds of motion in animals, one being vital, the other being voluntary. Vital motions include breathing, digestion, and circulation. Voluntary motion is directed motion triggered by the mind. Sensation is the result of external pressure detected by the sense organs. Hobbes credited imagination to small motions in the head. The difference between human intellect and animals is the kind of understanding peculiar to humans, which is rooted in the human will (Kenny, 1998).

Thomas Hobbes wrote on a wide-range of topics – philosophy, religion, mathematics, logic, psychology, language and optics. He served as a tutor to the future King Charles II of England while they were both exiled in Paris (1646). Hobbes' political philosophy was a derivation of his scientific philosophy. He was contemptuous of dynastic claims based on blood lineage, and sought to establish a new science of politics grounded on empirical observation, reason, and the effective use of force to preserve order. He felt that in nature, life was short, cruel, and nasty. Unlike John Milton (1608-1674), who advocated free speech in his pamphlet *Areopagitica* in 1644, Hobbes took the opposite extreme. Disturbed by the behavior of men during the English civil war, he became a forceful advocate of unrestrained state power. He was a proponent of an all-powerful state government. His most famous work, *Leviathan*, is a classic of political theory and world literature. In *Leviathan* Hobbes described the forces that converge to create the institution of the State (the Commonwealth). He described what it is like for men to live outside a commonwealth, in a state of nature, where the animal nature of man

emerges, where men are quarrelsome and fight in a competition for power, goods, and glory. This condition encourages men to seek peace and to give up some of their liberty in return for equal concessions from others. Men offer their freedom to a central power that maintains supreme sovereignty, representing the will of all members of the community. The central power, which he refers to as a great Leviathan, may be an individual or an assembly representing the Commonwealth.

In *Leviathan* the sovereign is the source of law and property rights and oversees the operation of the Church. It is the sovereign that interprets Scripture and determines correct doctrine. Individual liberty was limited to anything the sovereign did not control through laws. The Leviathan, which was a reference to the great sea monster in Job 41, represented for Hobbes the all-consuming power of the sovereign state. Hobbes, inspired by Galileo's deductive exploration of the physical universe, attempted to apply the same method to the study of human activity. Hobbes believed that everything could be explained in terms of matter in motion. Chapter 6 of *Leviathan* is entitled 'Of the Interior Beginnings of Voluntary Motions; commonly called the PASSIONS and the Speeches by which they are expressed.' Using deduction Hobbes' created the Leviathan, which is necessary in order to impose a state of peace on human beings. Hobbes questioned what should be done if the sovereign is a tyrant, usurping more freedom than is required. He answered that the worst despotism is better than anarchy and he supported absolutism in the monarchies of Europe (Coffin, Stacey, Lerner, & Meacham, 2002; Kenny, 1998; Seymour-Smith, 1998; Stipp, Dirrim, & Hollister, 1972).

In 1660 England's monarchy was restored after years of civil war and religious division. Hobbes' pupil, King Charles II, was restored to the throne. As a Catholic with a

French Catholic Queen, Charles entered into agreements with King Louis XIV of France to restore Catholicism in England. He signed a treaty that exempted both Catholic and Protestant dissenters from penalties of law. Over the course of his reign, he revived the power of the monarchy and replaced Puritan officials with avowed Anglicans. A two-party system emerged, the Whigs were Protestant, and the Tories were Anglican. The Tories favored Charles II and received offices and favors from him. The Whigs, not to be outdone, placed conservative party members into the king's camp. With the combined support, Charles reigned supreme. During his reign he expanded trade in India and America; he also proved to be a supporter of science, art, and literature.

King Charles II took notice of a group of scientists led by chemist Robert Boyle (1627-1691) and biologist Robert Hooke (1635-1703), who had formed a society for scientific study. The king expressed his approval and granted the group the esteemed name of the Royal Society. Its founder, Boyle in particular, felt that the Royal Society could play a significant role in restoring order and consensus to English society. Boyle hoped that the members of the Royal Society would combine Bacon's goal of collective research and discovery with the goal of restoring royal power and the authority of the Church of England. He believed that scientific discovery would unite England's natural philosophers with a common sense of purpose and a system of reasoned, gentlemanly agreement on 'matters of fact', thereby replacing the contentious behavior that led to the English civil war. Boyle believed that the purpose of the Royal Society was to create a forum where researchers could conduct experiments, record and share results, and offer their discoveries up to further investigation and critique.

The Royal Society reached out to other scientists in England and continental Europe through its newsletter, *Transactions*, which was first published in 1666. Similar societies soon cropped up all over Europe. Although scientific societies had existed earlier, they had failed to survive; the new societies flourished under state sponsorship. The formation of the new societies strengthened the mechanistic view of the world held by both Cartesian philosophers and English experimenters. Working within their societies, these various groups of philosophers created a new standard for scientific endeavor and success. The natural philosopher's work was shared in a collective. Through the constraints of publication, researchers learned what areas of research and explanation were legitimate within the societies, which eventually tended toward specific areas of research. The societies enabled exchange of ideas across national and philosophical boundaries and a new tradition emerged, which was the crediting of results to specific researchers. During the early years the greatest achievements were within the field of physics; the advances in physics quickly carried the field beyond the point where amateurs could make contributions.

The societies were open to men of accomplishment, without regard to birth. They encouraged clarity and precise objective descriptions, typically shunning articles of philosophical speculation that lacked experimentation or observation. Robert Hooke, as curator of the experiments for the Royal Society of London, screened all submissions, rejecting articles "meddling with Divinity, Metaphysics, Moralls, Politiks, Grammar, Rhetorick, or Logick" (Hooke, as cited in Stipp, Dirrim, & Hollister, 1972, p. 90). The objective of the Royal Society, which did not receive funding from the English crown, was the improvement of knowledge in regards to all natural things, including knowledge

that would improve the arts, manufacturing, mechanics, engines, and inventions. Not all societies, however, were as aloof from governmental concerns as the Royal Society. In France, Germany, and Russia the societies were influenced by the respective governments, who encouraged attention to advances in navigation or war machinery (Coffin, Stacey, Lerner, & Meacham, 2002; Stipp, Dirrim, Lerner, & Meacham, 1972; Tallack, 2001).

Boyle applied the basic concepts of Galileo and Descartes to chemistry. Boyle held a skeptical view of Aristotelian science. Aristotelians accepted the premise that all things were composed of four elements: earth, air, fire, and water. Boyle insisted on the use of experimentation to substantiate the facts of natural philosophy. Familiar with the principles of alchemy, Boyle used his knowledge of alchemy to conduct experiments. He concluded that there is something in air that was necessary for combustion (although he was unable to think of a way to isolate and identify oxygen). In addition to his work in founding the Royal Society, he is most noted for the development of 'Boyle's Law', showing that, under constant temperature, the volume of a gas decreases in proportion to the pressure placed on it. This is a classical case of empiricism in practice.

Along with being a curator for the Royal society, Robert Hooke was a physicist and biologist; he is most noted for using the microscope to discover the cellular structure of plants. In 1665 Hooke published *Microphagia*, in which he provided the first description of cells. He also described plant and animal fossils and compared their microscopic structure to living organisms.

Hooke was also interested in the cause of earthquakes. He attempted to use Bacon's method of empirical investigation, collecting data on the locations where

earthquakes occurred, as well as where they did not. He then tried to carry out rejections and exclusions based on the data. Not surprisingly, he could make no further progress in determining the cause of earthquakes. Subsequently, he formulated four hypotheses, disproving three of them. He formulated a method for testing the fourth hypothesis, but never succeeded in carrying it out. The point of interest in this exercise is Hooke's appreciation for the necessity of hypotheses based on a limited set of knowledge. Hooke also developed a working theory of gravitational attraction, although it was his colleague Isaac Newton who receives credit for mathematically demonstrating the operation of gravity in the solar system (Oldroyd, 1986; Stipp, Dirrim, & Hollister, 1972).

The formulation of the Royal Society, along with Hobbes' political theory and Descartes' philosophy, set the stage for two Englishmen, John Locke (1632- 1704) and Sir Isaac Newton (1643-1727). A member of the Royal Society of London, Locke was a lawyer, a physician, and a member of the Whig party. While serving as a tutor in the household of the first Earl of Shaftesbury he became involved in political controversies and spent part of his life exiled in Holland, returning to England after the Glorious Revolution (1688-1689).

Locke opposed the absolutist politics of his time. Religious wars and the Inquisition marked the 16th and 17th centuries. Europeans during this period found it acceptable, if not required, for men to torture, kill, and burn at the stake people who held different religious views, even if the differences were minute. Tired of the fighting, John Locke published a letter titled *Toleration* in 1689. In his letter Locke clearly articulated that a truly Christian Church would not compel men to convert to particular doctrines by means of fire and sword. Locke opposed the absolutist philosophies of Hobbes and King

James II (who came into power following the death of his brother Charles II in 1685). In reaction to the absolutism of Continental Europe, Locke wrote *Two Treatises of Government*; written earlier, it was published in 1690. His theories were prevalent within England and were used to justify the events that led up to the Glorious Revolution in England (Scharfstein, 1998; Van Doren, 1991).

Locke asked the same questions as Descartes: Are animals machines? Does soul always think? Can there be space without matter? Both Descartes and Locke believed there is an inborn capacity for understanding unique to human beings, and that experience is not necessary to understand and agree to self-evident truths. Locke argued that man is triune – consisting of a man, a spirit, and a person (meaning that man is material, immaterial, and possesses a center of self-consciousness). Lock also concluded that conflicts over the meaning of words and contradictory assertions arose because men carried their inquiries beyond the experience of the mind (Oldroyd, 1986; Stipp, Dirrim, & Hollister, 1972).

In 1690 Locke published *An Essay Concerning Human Understanding*, in which he stated that the mind derives its ideas from sensory data. A firm believer in the scientific method, Locke praised the work of Isaac Newton's *Principia* in the opening of his *Essay*. The *Essay* represents Locke's lifetime interest in philosophy and the foundations of natural science. It was immediately accepted and promoted within scientific and philosophic circles of the time. The arguments within the book directly opposed the most important tenets of Cartesian rationalism, but his language is clearly influenced by Descartes, and can be read as a critical reflection on the term *idea*, which

Locke deliberately adopted from Descartes with the intention of freeing it from its rationalist connotations.

Locke differed from Descartes in his argument that all our ideas derive from our experiences (Descartes argued for innate knowledge and *reason* rather than experience as the basis of ideas). Locke was an empiricist who modified the empirical psychology of Hobbes and found Descartes theory of innate ideas unacceptable. Locke viewed the human mind at birth as a blank piece of paper upon which ideas developed during life as a result of experience. He left no room for transcendental Platonic universal ideas. Hence, there are not innate ideas or principles. Locke considered valid sensations only the mathematical, physical primary qualities of solidity, extension, form, and motion. He promoted a mechanical philosophy based on nominalism, by which all things are classified based on the physical constitution of the object, not the essence of the object (Oldroyd, 1986; Scruton, 1995; Stipp, Dirrim, & Hollister, 1972).

Locke was a compatriot of Newton and his philosophy impacted Newton's view of the world. Newton was born at a time in history when a synthesizer of his remarkable ability could unite the discoveries and developments in physics and mathematics. Following receipt of his bachelor's degree at Cambridge, the University was shut down in the summer of 1665 due to the plague. Newton returned to Lincolnshire where, in a little more than a year, he developed integral calculus, discovered the compound nature of white light (which refuted Aristotelian and Cartesian concepts about the nature of light), and developed the essentials of the law of gravitation. He published his findings in two books, *Philosophiae Naturalis Principia Mathematica* (*The Mathematical Principles of Natural Philosophy*) published in 1687 and *Optiks*, published in 1704. Newton's work

was a mix of different theories and philosophies. He shared the Cartesian belief in the power of mathematics to describe nature, but disliked Cartesian logic and their indifference to studying the behavior of objects in nature.

Newton presented his results on the study of optics to the Royal Society in 1672, launching him immediately into discord with the society's president, Robert Hooke. A series of bitter arguments ensued between the two. As a mechanist, Hooke disparaged Newton's work for neglecting to identify the underlying mechanical causes for the nature of light. Hooke challenged Newton's theories of orbital motion on the same grounds – they were descriptive, but did not explain. Stung by the criticism, Newton withdrew and returned to his college and his work on alchemy and theology. He returned to the study of orbital motion only on the encouragement of one of his few close friends, Edmond Halley (1656-1742). Halley disagreed with Hooke's mechanistic explanation of orbits and asked Newton his opinion. Newton claimed to have lost his papers and launched on a new five-year obsession of explaining the problems of motion. Following his work, Halley provided the financial support for the publication of *Principia*.

Newton's physics replaced Cartesian physics. In *Principia*, Newton presented a set of four rules for scientific reasoning and his three laws of motion. By their application, Newton formulated the universal laws of nature. Newton described the universe in terms of mass, attraction, and laws of motion, incorporating Kepler's laws of planetary motion into a general mathematical model. Newton's laws were quickly assimilated into the scientific community and applied successfully to all types of celestial and terrestrial phenomena. This reinforced the mechanistic, clockwork view of the universe in which every event follows from previous events and is predictable according

to the basic laws of nature. So sweeping was his description of the universe that intellectuals soon found themselves in a world devoid of animistic spirits. Newton believed that his investigation and discoveries supported religion; that God had created and set the giant clock in motion. The problem was that his new concept of the universe was at odds with the traditional view of the world provided by theologians who had based their cosmology on Aristotelian philosophy.

After publishing *Principia*, Newton turned his attention to politics and governmental affairs. He himself was far more interested in alchemy, Gnosticism, prophecy, theology, and the work of the German mystic Jacob Boehme than in mathematics and physics. Newton was a heretic and an Arian, believing that the Church had strayed and abandoned the belief that God created Jesus Christ as anything more than an instrument for the creation of the world. Newton never made a serious attempt to reconcile his own occult and scientific views, which were sometimes at odds with one another. He served in Parliament on two occasions and became master of the mint during the time that England was converting its coinage. He spent considerable energy in a personal conflict with Leibniz over who had precedence in the development of the calculus, each accusing the other of plagiarism. From 1703-1709 Newton returned to the field of science, serving as president of the Royal Society. It was during his time with the society that he published *Opticks*.

In *Opticks* Newton wrote in a simpler literary style than he had in *Principia*, relying less on mathematical modeling and more on deduction and experimentation. The major theoretical claim of *Opticks* is that white light is a mixture of lights of different colors. Descartes had proposed that a prism *produced* color when the corpuscles of white

light hit the prism obliquely, thereby creating different spins in the light corpuscles as they made glancing contact with the prism. Newton, however, thought that the prism simply sorted the light into the various colors already present in the white light. To prove his theory, he demonstrated how the colors could be recombined to give white light by sending the color spectrum through a second inverted prism.

Newton claimed that conclusions about natural science could be obtained without hypothetical reasoning using only the first principles inferred directly from experiments.

In his '31st Query' to the *Opticks* he states

As in mathematics so in natural philosophy, the investigation of difficult things by the method of analysis, ought never to precede the method of composition [i.e. synthesis]. The analysis consists in making experiments and observations, and in drawing general conclusions from them by induction, and admitting of no objections against the conclusions, but such as are taken from experiments, or other certain truths. For hypotheses are not to be regarded in experimental philosophy. And although the arguing from experiments and observations by induction be no demonstration of general conclusions; yet it is the best way of arguing which the nature of things admits of, and may be looked upon as so much the stronger, by how much the induction is more general. And if no exception occur from phaenomena, the conclusion may be pronounced generally. But if at any time afterwards any exception shall occur from experiments, it may then begin to be pronounced with such exceptions as occur. By this way of analysis we may proceed from compounds to ingredients, and from motions to the forces producing them; and in general, from effects to their causes, and from particular causes to more general ones, till the argument end in the most general. This is the method of analysis: and the synthesis consists in assuming the causes discover'd, and establish'd as principles, and by them explaining the phaenomena proceeding from them, and proving the explanations (Newton, 1704, as cited in Oldroyd, 1986, p. 82).

Newton's methodology differed significantly from Hooke's. Although Hooke was more successful in his experiments based on discovery rather than hypothesis testing, he was willing to use hypotheses when data observation failed to produce first principles of discovery. Newton, on the other hand, was careful to avoid any accusation that his

reasoning was in any degree hypothetical. His terminology was exactly opposite of Hooke's. Newton insisted on general conclusions drawn inductively from experiments and observations and then subject to only experimental refutation, not metaphysical debate. Newton felt that scientific conclusions were secure in so far as the principles were drawn directly from experiments and observations. From a logical philosopher's point of view, conclusions arrived at through induction are invalid. In reading Newton's *Opticks*, regardless of his terminology, he used both inductive and deductive methods to arrive at his conclusions. It would appear that Newton possessed a general belief in the uniformity of Nature; general principles could supposedly be deduced (or inferred) from observations and experiments. Newton rejected speculations as hypothetical that exceeded the limits of experimental inquiry. In the third edition of *Principia* (1726), Newton provided four 'Rules of Reasoning in Philosophy'

1. We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances.
2. Therefore to the same natural effects we must, as far as possible, assign the same causes.
3. The qualities of bodies, which admit neither intensification nor remission of degrees and which are found to belong to all bodies within the reach of our experiments, are to be esteemed the universal qualities of all bodies whatsoever.
4. In experimental philosophy we are to look upon propositions inferred by general induction from phenomena as accurately or very nearly true, notwithstanding any contrary hypotheses that may be imagined, till such time as other phenomena occur, by which they may either be made more accurate, or liable to exceptions (Newton, 1726 as cited in Oldroyd, 1986, p. 82).

The first rule is a restatement of Ockham's philosophy of parsimony in science. Other things being equal, and given a choice of theories, explanations, hypotheses, laws, etc, the simplest one is preferred. The second and third rules highlight Newton's perspective on the uniformity of nature. The fourth rule restates the position he provided in *Opticks*

that induction and experimentation are the only valid means to draw general conclusions about nature.

In 1704 Newton announced a new telescope design; he replaced the glass lenses with a curved mirror used to gather in light and reflect it back to a point of focus. This reflecting mirror allowed for greater levels of magnification, dependent only on the size of the reflecting mirror.

Newton was fascinated with alchemy and spent a great deal of his time pursuing the possibility of the transmutation of base metals to precious metals. He wrote extensively on the subject of alchemy, but did not publish his research. He did write several books that combined his study of alchemy and theology.

His *Principia* was written in complex mathematical form and defies any but the most advanced mathematician to comprehend, yet *Opticks* was written in an easily read format. Newton was eccentric, living surrounded by the color crimson (and nothing but crimson). His biographers credit him with being secretive, obsessive, vindictive, and petty. His obsessive personality fueled his passion to fully understand a topic. Once he became aware of a problem, it consumed his attention for months or years at a time. If he lacked the tools for adequate experimentation he created them, thereby improving prisms and creating the reflecting telescope. There is conjecture that his eccentric behavior may have been the result of mercury poisoning (as a result of overexposure during his alchemy experiments) (Coffin, Stacey, Lerner, & Meacham, 2002; Ladyman, 2002; Oldroyd, 1986; Seymour-Smith, 1998; Stipp, Dirrim, & Hollister, 1972).

Newton's physics and Locke's mechanical philosophy of science stirred a vigorous debate between 18th century philosophers. Gottfried Wilhelm Leibniz (1646-

1716) and George Berkeley (1685-1753) both opposed Newtonian science and Locke's empirical philosophy. Many mechanistic philosophers, especially the Cartesians, admired Newton's skill but rejected his presentation of 'forces', which appeared to lean toward mysticism and lacked any driving mechanism. Newton stood firm in his conviction that the goal of science is to study and describe the nature of the universe. He believed it was vain and scientifically improper to seek an underlying explanation to what he still saw as God's handiwork (Coffin, Stacey, Lerner, & Meacham, 2002).

The thinking of German philosopher Gottfried Wilhelm Leibniz was influenced by the writings of both Malebranche and Spinoza. Leibniz was the son of a professor of philosophy at Leipzig University. He started to read philosophy at an early age; by the age of thirteen he was familiar with writings of the scholastics. He studied mathematics at Jena and law at Altdorf. He entered the service of the Archbishop of Mainz, providing him an opportunity to travel to Paris where he met many of the leading thinkers of his day, including followers of Cartesian philosophy. He also met Spinoza and studied his work. Originally an admirer of Spinoza, he later took exception to his proofs. He felt that Spinoza's determinism and his description of an indifferent God was a danger to religion. It was in the service of the Archbishop that Leibniz invented infinitesimal calculus, unaware of Newton's earlier and as yet unpublished discoveries on calculus.

Leibniz was extraordinarily curious and an exceptional thinker. He wrote on mathematics, logic, linguistics, physics, law, religion, and politics. He published very little during his lifetime. Among the most important of his works was *The New Essays on the Human Understanding*, written partly in answer to the empirical theories of Locke, and published posthumously. Most of his philosophy, however, is written in the

correspondences he carried on with other philosophers. He made several attempts to reunite the Christian churches and to establish a united, peaceful Europe. His favorite project was the development of a universal language by which all people could learn to communicate. He believed that the characters of Chinese writing were evidence that there was once a universal 'Adamic' language, and that such a universal language could be reinvented. He considered even calculus as part of an all-embracing system of universal signs (Kenny, 1998; Scharfstein, 1995; Scruton, 1995).

Leibniz argued for the possibility of human immortality, including survival of the soul. But – unlike Spinoza who believed that humans survive death only in part, dispersed in the infinite mind of God – Leibniz felt that immortality was worthless if the soul did not maintain an individual identity that was indivisible and not extended in space. Leibniz referred to these indivisible entities as monads. His book *Monadology* is a presentation of his metaphysics.

Leibniz was a defender of Cartesian rationalism. He believed that science could be absorbed into metaphysics once it was seen that scientific discoveries are only related to phenomena and not the underlying reality. For Leibniz, natural science is the representation of the world as it appears; however, the world as it really is can only be known from the self-evident principles of rational thinking (Scruton, 1995).

The personal relations between Leibniz and Newton were tainted by the dispute over who invented the calculus. Newton himself, however, rarely engaged directly in debate with Leibniz, using instead men of various disciplines who were anxious to see the Newtonian science and its associated metaphysics established as the standard for scientific exploration. Newton thought of space in terms of a holding place in which

bodies could move freely and that all of the bodies would be known to God even in the total absence of matter. He applied the same consideration to the flow of absolute time, even in the absence of all motion or matter. Leibniz found Newtonian metaphysics objectionable.

Most of the discord between Leibniz and Newton is found in the correspondence between Leibniz and the Newtonian spokesman Reverend Samuel Clarke (1675-1729). Unlike Newton, Leibniz favored the Cartesian method of deducing the metaphysical basis of the universe from a few *a priori* first principles. Leibniz saw God as providing the ultimate reason for the existence of things. Therefore, the reason for the existence of all things resides in the mental entity of God. Leibniz attempted to use logic to prove the existence of God. Using reason he argued for the existence of one God, since one is sufficient for all things to exist. God then made a choice out of all possible realities, the one that possessed the highest degree of perfection; that world would necessarily be one of universal harmony since God the Creator was perfect.

In Leibniz' view, the universe was a plenum, without any void or vacuums, since the presence of a void would make it less than perfect. Leibniz also denied that there could be two different things that were identical in all respects. Leibniz extended his theory to human beings. For example, before deciding to create the world, God surveyed all the infinite number of possible creatures. Among the possible creatures there are many possible versions of each person choosing a different set of actions. When God chooses one of the versions, he is actually making a freely-choosing being, even though God knew his choices before God elected to create him. With these principles Leibniz entered

into the debate on the merits of Newtonian physics with Samuel Clarke as the point of contact between Leibniz and an opposing group of philosophers.

Although Leibniz' cosmology has proven to be inaccurate, he did accomplish a notable feat. In the course of his correspondence with Newton/Clarke, he argued that space and time were relational, not absolute, and that they were *ideal* rather than real. In so far as matter exists in space and time, as they existed they did so in the mind – they were mental constructs. For example, matter can be moved to occupy the space previously occupied by other matter; therefore space is simply the collection of all places. Time is measurable only in relation to change in matter. If there were no motion or change in the universe, there would be no passage of time.

Newton and Clarke may have seen the merits of a relational theory of space and time, but argued instead for a universe in a constant state of motion. Amongst scientists, this debate continued for centuries. Following Einstein's theory of special relativity, most modern scientists have come to accept a relational view of space and time (Kenny, 1998; Oldroyd, 1986; Scharfstein, 1998).

ACT TWO

Scene 5

MINERVA: So, you see, Jake, even scientists experienced a division of philosophy.

Continental Europeans followed Descartes and the use of reason; and the English followed Bacon's empirical method.

(Jake nods thoughtfully)

DAVID: Very interesting. I've read that Descartes sparked the modern debates about

philosophy, but I never knew it was because he separated the body and mind. Is that why medicine has split into a separate field from psychology?

MINERVA: Yes, to some degree that is correct. After Descartes, things metaphysical, such as human consciousness, were deemed the subject of philosophy while things physical were deemed the realm of science.

ABBY: Well, speaking of physical, I think it is time we break for lunch. My stomach is growling! I have sandwiches set up in the kitchen. Let's break for a while. I'll call George and Ellen down for lunch.

(All voice their agreement and stand to move around the Great Room. Abby leaves the room.)

BILL: Is it still snowing?

ADAM: Looks like – we must have gotten 3 feet so far! I think it's tapering off. The weather report says the storm is supposed to move out tomorrow.

TONI: Hopefully they can get us plowed out in the next day or two. I have to get back to work!

ADAM: Makes me glad we're all inside with some hot cocoa – let's go get those sandwiches!

(As they all move out the door toward the kitchen George and Ellen come down the stairs)

JAKE: Hello! George. Ellen. Glad you came down – if you're finished with your calls you should stick around after lunch – this is really getting interesting.

GEORGE: Thanks for the invite – we might just do that – I'm starting to get some serious cabin fever.

ELLEN: Me too – and my office staff seems to be doing just fine without me! I might as well join you or I'll drive them crazy checking in every half hour.

(lights dim)

(lights back up – everyone is lounging in the Great Room).

DAVID: Thanks hon', that was a great lunch.

ADAM: Sorry I ate so much – I didn't know all this thinking could make a guy so hungry!

(everyone chimes in to add their appreciation)

ABBY: You're all welcome. David – will you add a couple of logs to the fire?

DAVID: Sure!

MINERVA: Well – is everyone ready to pick back up on our discussion?

BILL: I can't wait to see where we go next.

ELLEN: Well, from the conversation over lunch it sounds like you went over my head!

JAKE: All the stuff about the scientists and philosophers is interesting and all, but what about the little guy? I don't think most people cared too much about what scientists were doing. Life was pretty rough back before all our modern conveniences.

GEORGE: Yeah, I can't imagine living back then. I don't think I was cut out to be a farmer. I love the excitement of buisness and the fast pace of changes.

MINERVA: Starting with the Renaissance, things started changing pretty fast. The pace may have picked up in the twentieth century, but the sixteenth and seventeenth centuries introduced some dramatic changes in how many people lived. You

might call the two hundred years before the revolution in textiles as the pre-industrial revolution. Consider the notion that

The Commercial Revolution and the Industrialization of Society (1500-1700)

The Renaissance ushered in a vibrant intellectual life and the promise of new prosperity. Experimentation within the arts and sciences spread into economic life as men began to explore new ideas and practices. Many of the old industries that catered to medieval life disappeared and were replaced by new ones. Industry became more capitalistic and subject to increasing regulation by the national state. In the more progressive areas of Europe, thrifty peasants advanced economically into a growing middle class, bringing about the end of the manorial system. Capitalists transformed the ancient guilds into more open enterprise systems. In economic life, as in philosophy, art, and science, experimentation with new ideas and practices aided in man's conquest over his environment.

The discovery of new routes to the Orient and the new continent of America by Spanish and Portuguese explorers opened up the opportunity for western Europe to dominate the sixteenth century economy. New trade routes shifted the commercial center of gravity from the Mediterranean to the nations of the Atlantic seaboard. The influx of new goods into western Europe created new crafts and a rise in capitalism, increasing the prominence of merchant princes and financiers. The towns of Germany were the first to benefit from the new trade routes and the economic decline of the Italian city-states. Antwerp was located at the crossroads of the trade currents of the times, located at a convergence of land-routes and sea-road, housing merchant societies from all over

Europe. Antwerp was home for a time for Erasmus and an asylum for a variety of political and religious refugees from other countries. Antwerp served as a distribution center for learning through the world-famous printing press of Pantin.

As the center of trade moved to Antwerp, other German cities previously involved in Mediterranean trade began to compensate by developing new industries, including the manufacture of guns, terrestrial and celestial globes, and watches. Shrewd merchants accumulated wealth and invested it into mining operations and iron production in other countries. The commercial leadership of Antwerp stimulated other Flemish towns to industrial activity. Typically, the transition from medieval exclusiveness to capitalistic commerce took place quickly and easily and was supported by the policies of Emperor Charles V (1519-1556). The case of Ghent, however, was a little unique.

In 1540 the master craftsmen and working class of Ghent raised an armed revolt against the Emperor to maintain their ancient regulations. They were easily beaten, their leaders accused of treason, craft property seized, and the ancient town charter revoked. It was only after these drastic measures that Ghent was willing to accept outside merchants and ceased to be a closed society. During the reign of Philip II, the commercial supremacy of the Netherlands (or Low Countries) was threatened. The popularity of the Protestant faith among the workers, artisans, and merchants was challenged through repressive actions on the part of the emperor; this, coupled with the burden of high taxes, caused general strikes and the closure of shops. During the warfare between William the Silent and King Philip II, Antwerp was sacked and forced to forsake its supremacy in the marketplace to Amsterdam. Dutch towns, like Rotterdam and Leyden, prospered and became centers of brilliant artistic and scientific development. The influence and

prosperity of towns in the southern provinces (Belgium) under Spanish control declined. Furthermore, the policies of Philip II brought economic disaster to Spain and its financial backers. The loss of northern Netherlands and the defeat of the Armada by England resulted in the bankruptcy of the monarch (1596) and the collapse of Spanish finances.

As Spain declined, the towns of England and France shared in the new prosperity. The influx of gold and silver from the mines of the New World remedied the problem of money scarcity. The hostility of the Church toward the use of capital for personal gain, a limiting factor in medieval society, was replaced by enterprising Protestant beliefs. Calvinism, and its various offshoots that conquered most of northern Europe, took economic organization for granted. Calvinists used advanced forms of economic organization in order to spread their religion, placing the earnings of commerce on the same level of respectability as the earning of the laborer or rents of the landlord. The manorial system, which was part of the basis of power for the Catholic Church, was replaced in Protestant principalities with capitalistic systems. The financier was no longer looked upon as a pariah of society; the payment of interest was regarded as a legitimate return for services rendered.

As commerce expanded through the sixteenth century, small independent merchants found it difficult, if not impossible, to travel to the trade centers of Europe to transact business. The cost of transportation, changing prices, and the varying qualities of goods became an issue. Wealthier merchants united into 'rings' – associations or companies established to pool resources for buying and transportation. These rings developed into large monopolies, controlling Asiatic trade and prices on Oriental commodities. The rings, with ample supply of money, soon controlled other

commodities, such as wheat, silver, copper, steel, iron, linen, and leather, as well as foodstuffs such as sugar, spices, cattle, wine, meat, and tallow (Botsford, 1936).

The monopolies created by merchant associations changed the European economy and society. Wealthy merchants provided the economic basis for the 'putting-out' system in order to meet market demands and reap large profits. Merchants bought up a stock of raw materials, most often wool or flax, which they then 'put-out' to rural workers for carding and spinning. Once spun, the merchants collected the yarn or thread and passed it on to rural weavers, who wove it into cloth. The merchants would collect the material and pass it on to other workers who would bleach or dye it. The merchants collected the cloth a final time and either distributed it to a wholesaler or sold it directly to retail customers. Through the putting-out process, industries employed home workers by the thousands. By the mid-eighteenth century, a major textile firm in Abbeville, France provided work to eighteen hundred people in central workshops and another ten thousand in their own homes.

Rural workers used the putting-out system of manufacturing as a way to feed their families during years of particularly bad harvests. Domestic manufacturing involved the entire family, and included even the youngest children who participated in the process of cleaning the raw wool. In addition to providing extra income, the putting-out system allowed workers to regulate the pace of their labor to some degree and to abandon it altogether when farm work was available during the planting and harvesting seasons. Working conditions in poorly built and ventilated cottages was cramped and unpleasant, but was still preferable to working away from home in a shop where conditions might be even more oppressive under the scrutiny of an unsympathetic master.

In France, the putting-out system was employed in the production of metal work, with migrant laborers providing a work force for small, self-contained shops. In Germany, clocks and toys were produced. In England, the production of iron grew fivefold from the mid-sixteenth to the late seventeenth century. Due to the problem of fuel scarcity in England, a Worcestershire iron-master by the name of “Dud” Dudley began to experiment in the use of coal and coke (1619). Despite resistance by angry mobs who feared his methods would eliminate existing jobs, and in spite of the revocation of his patents by Parliament, Dudley persisted in the smelting of pig iron with coal as the new fuel source. Although unable to achieve commercial success, his experiments and inventions were directly responsible for the common use of coke, and English leadership in the iron industry.

In addition to commercial enterprise, the presence of merchant monopolies promoted improvements in agriculture. Since the late Middle Ages, local providers of agriculture, livestock, and dairy supported every major trading city. In England, northern Italy, the Low Countries, Switzerland, and parts of France and Germany, commercialized centers and their accompanying supply centers remained free of serfdom and forced labor. Elsewhere in Europe, agriculture was predominantly a subsistence system controlled by the village. In less developed areas in eastern Europe, the peasants were reduced to serfdom. Even when peasant serfs produced excess goods for export, their lords depended on discipline and punishment rather than economic rewards or improved technology to make a profit.

The medieval tradition of open, common-field farming was one of the obstacles of efficient agricultural practices. Under common-field farming, the holdings of

individual peasants and their lords were scattered throughout fields in the village. The fields were farmed communally, with livestock grazing together on common pastureland. The purpose of this system was to protect any one family or lord from the devastation wrought by localized crop failure and to prevent the monopoly of the most productive lands by a few families. While serving as a safeguard, it also acted as a serious impediment to agricultural experimentation and prevented the introduction of new crops since the entire village had to agree to convert a field to a new crop. The system also limited the number of people that the soil could support. Fields were left with only post-harvest stubble. With only field stubble, common meadows, and forests for livestock to graze on, the supply of meat, milk, and work animals was drastically reduced. Excess cattle were slaughtered in the fall to assure the survival of the rest during the winter. The lack of cattle translated into a lack of manure to replenish the soil. Communal fields inhibited the opportunity for experimentation and did not promote the isolation of herds for selective breeding or quarantine from cattle plagues. In addition, peasants had little desire to make improvements since all proceeds went to their lords. Under these conditions, periods of famine were built into the system.

Once landlords began to compete for markets as capitalist agricultural entrepreneurs, they began to look for ways to eliminate the inefficiencies and improve the yield on their lands. In England and Holland, landlords began to enclose their fields, reorganizing the land within the villages. Because of the profits from wool, some landlords converted common pastures shared by the peasants into their own holdings for the raising of sheep. During the eighteenth century, many landlords took steps to abolish the common-field system on their estates and adopted 'scientific farming'. The new

system involved a reduction in the amount of land that lay fallow in any given year. New farming methods and new crops enabled landlords to keep a higher percentage of their arable land under continuous cultivation. The new crops – clover, alfalfa, and turnips – helped to replenish the nitrogen level in the soil, restoring soil fertility. Other improvements in farming methods included intensive hoeing and weeding (made possible by hiring cheap labor). Englishman Jethro Tull published a work in 1731 promoting the adoption of horse-drawn hoes and seed drills, both of which improved productivity and reduced waste.

The new crops also provided excellent winter food for animals, aiding in the production of more and healthier livestock, which also meant more manure. More manure translated into another way in which scientific farmers could nurture the soil and reduce the need for fallow land. Robert Blakewell pioneered selective breeding of livestock with dramatic results. By the end of the eighteenth century, programs in selective breeding resulted in a doubling of the average weight of cattle and sheep in England.

All these improvements were profitable to landlords, but made a negative impact on the social and economic lives of villagers. Field enclosures cost villagers their ability to raise livestock on common land and the traditional right to participate in determining how the community's subsistence economy would be managed.

Enclosure was more easily accomplished in England due to the existence of a system of absolute property rights and wage labor. In Continental Europe, other than in Holland, there was nothing comparable to the English enclosure of open fields and advances in scientific farming. Even so, European food production became increasingly capitalistic in the seventeenth and eighteenth centuries. Landlords leased farms and

reaped profits as rent or in the form of sharecropping (Coffin, Stacey, Lerner, & Meacham, 2002; Stipp, Dirrim, & Hollister, 1972).

In the ports of Europe, from Spain to Sweden, shipyards sprang into existence. In their wake, new industries emerged: makers of canvas for sails, of ropes, hawsers, and anchors; all ancient industries, but with a renewed zest. Shipbuilding and the subsidiary trades were considered essential to national self-sufficiency. Trade became a national industry, and not just the pursuit of the lower classes in society, as during the medieval period.

Nobles and gentlemen demanded finer clothing. The demand for articles of personal adornment spawned new cottage industries, from the production of wigs and beaver hats to canes, umbrellas, and fans. Occasionally, specialized industries became localized bringing fame to particular cities. Amsterdam, for example, became home of the diamond industry, largely because the arts of cutting and polishing were introduced there by Portuguese Jews who had been expelled by Philip II. The skills of these refugees were passed down to their descendants, establishing Amsterdam as the diamond center of the world.

The pattern of life for most Europeans during the period of time between 1600 and 1800 was centered on the struggle to stay alive. While the European economy underwent sweeping transformations, European society changed much more slowly. Europeans remained committed to ideas of social order and hierarchy rooted in the Middle Ages. Landlords still dominated peasants and nobles still gained their wealth and power based on birth. Although vast fortunes were made in overseas trade, famine, disease, and poverty remained features of seventeenth-century European society. These

features did not change until improvements in European agriculture broke the traditional limitations imposed on population growth by inadequate food supply and the accompanying epidemic of diseases. An account of the life of French peasants in the late seventeenth century noted that

The general run of people seldom drink [wine], eat meat not three times a year, and use little salt...So it is no cause for surprise if people who are so ill-nourished have so little energy. Add to this what they suffer from exposure: winter and summer, three fourths of them are dressed in nothing but halfrotting tattered linen, and are shod throughout the year with sabots [wooden clogs], and no other covering for the foot...the extreme poverty to which they are reduced, owning as they do not one inch of land, rebounds against the more prosperous town and country bourgeois, and against the nobility and the clergy...people [are] weak and unhealthy, especially the children, many of whom die for want of good food; secondly, the men become idle and apathetic, being persuaded that only the least and worst part of the fruit of the labors will turn to their own profit; thirdly, there are liars, robbers, men of bad faith, always willing to perjure themselves provided that it pays...Vauban, 1696 (as cited in Coffin, Stacey, Lerner, & Meacham, 2002, p. 559).

Before 1750, famine and disease suppressed population growth and held the average life expectancy to thirty years or less. In the following century improvements in agriculture supported population growth and extended the average life expectancy.

ACT TWO

Scene 6

MINERVA: But it took a change in philosophy to bring about the changes in everyday life.

JAKE: How so, Minerva?

MINERVA: The Catholic Church supported the feudal system. The Church elevated the

spiritual value of poverty and opposed capitalism as a source of evil, all the while expanding its own economic empire. Protestantism introduced the notion of hard work, capitalism, and individual accountability. With the shift in philosophy came a shift in the perspective of the common person. The change in perspective also changed the nature of questions posed by scientists and entrepreneurs.

BILL: Give us an example, Minerva.

MINERVA: Consider the example I just gave concerning the changes in English agriculture during the late seventeenth and early eighteenth century. Once people accepted the point of view that they were accountable for their own salvation and their own well-being, they were forced to look for the means to affect both. This means that everything doesn't just happen, but that I, as an individual, must make it happen. Now men and women have the responsibility to take control of their destiny rather than accept that their lives are a matter of fate. With that comes the question of what to do and how to do it.

BILL: That's all well and good, but not everyone agreed on a common philosophy.

MINERVA: True. And it is disagreement over the merits of empiricism and reason that has driven philosophic debate, and therefore religious debate, for centuries. One side argues for empirical evidence and the other for innate knowledge acquired through the use of reason. The dividing line, as I shared, was represented in the difference in philosophies between Rene Descartes and Francis Bacon. One reasoned to an understanding and the other searched for empirical evidence. Descartes claimed "I think, therefore I am" while the other claimed existence

through empirical evidence. Bacon believed that man could hold dominion over the universe through science.

GEORGE: Hmph...that explains some of the difference between American thinking and European thinking today, doesn't it? We and the British tend to be a little more alike.

MARY ANN: I don't know – I've travelled to England and I think there is a lot of difference between us and them.

MINERVA: Yes, but that difference is the result of the additional factors that affected American thinking after the American Revolution , especially once new generations were born in America. But we'll get into that a little later.

TONI: Minerva – can you give us a little insight on the differences between English and continental European philosophy and science. Wasn't there still a lot of cross-over between the two?

MINERVA: Sure, Toni. And you are right – the empiricism of Locke and Newton were soon challenged. With the printing press, ideas were freely exchanged, which also helped to stimulate dialogue across England and Europe. The free exchange of ideas created the intellectual climate during the eighteenth century that we now refer to as the Enlightenment. I'll begin with the debates that took place over the empiricism of Englishman John Locke...

English Philosophy and Science in the Eighteenth Century

By 1700 the view of Newton, Locke, and most of the educated people of England was that the world consisted of atoms ('corpuscles') which God had set to work in a

mechanical fashion. Newton and Locke proposed that the primary qualities of matter were its weight, shape, size, and motion. The secondary qualities of taste, color, and other attributes of beauty were not matter at all – they were only within us. Although he was an empiricist, George Berkeley (1685-1753) took exception with the scientific views of his time and especially with the work of Locke.

Berkeley was born in Kilkenny, Ireland. In 1700 he entered Trinity College in Dublin where he was educated on generally Lockean principles. He published three philosophical works between 1709 and 1713: *An Essay Towards a New Theory of Vision* (1709), the *Principles* (1713), and the *Three Dialogues Between Hylas and Philonus* (1713). Berkeley attacked Locke's concept of matter on the grounds of common sense. Disliking the proposition of primary and secondary qualities and the use of empirical evidence, Berkeley concluded that it was possible for matter not to exist. Berkeley was repulsed by Locke's description of the universe as a great machine absent of the daily influence of God. Locke struggled with the problem that things might really be different than they were perceived. Berkeley's answer to the problem was to deny their existence. He took the premise that all of creation had no subsistence without a mind to a logical conclusion. For Berkeley, reality is the existence of an infinite and eternal God communicating with His human creation by means of *ideas*. All physical objects are simply a collection of *ideas*. Berkeley's immaterialism was the result of a clearer, yet narrower application of the concept of *ideas* as presented by Locke.

For Berkeley, *ideas* are mental particulars – perceived objects are revealed to our minds and they comprise all actual mental contents. Images, sense-experiences, thoughts, and concepts are all *ideas* since all are immediate objects of mental perception. Having

made this assumption, Berkeley argued against Locke's theory of abstraction, claiming that since everything that exists is a particular, there can be no such thing as an abstract idea. Locke described abstract *ideas* as representative of an object. This argument was eliminated by Berkeley's assimilation of *ideas* and images as a single mental category. Berkeley claimed that Locke's theory of meaning left a gap between experience and idea. Berkeley made experience and *ideas* one and the same.

Berkley rejected Locke's distinction between primary and secondary qualities. He thought that any argument for the unreality of secondary qualities established the unreality of the primary qualities. He also denied Locke's view of substance, claiming that we can have no idea of the pure 'substratum' divested of its qualities. Berkeley confused the Lockean 'substance' with the material stuff of the physical world and used the word *idea* to name all the qualities, sensations, and concepts that come from ideas, failing as such to describe the relationship between appearance and reality.

Berkeley used Cartesian philosophy to explain terms like soul, mind, and spirit. His concept of ideas proved inadequate to explain the presence of an idea that is not identical with its content. For example, he admitted that the mind is not itself an idea since it is not identical with any of its contents; if you take away all the contents of a mind, the mind still exists since it is not identical with any of its contents. Berkeley found it necessary to say that we have a *notion* of the substratum that comprises the mind, but not an *idea* of it. Having addressed the concept of the mind, Berkeley concluded that the world is more than it seems to be – it is as it appears to God. Humans have an imperfect knowledge of the world, but we can still trust in the beliefs that arise cogently and

naturally as perceptions that God gives us. He argued that the beliefs we hold which are not products of our own will are imposed on us from God.

After failing to create much interest in his theories, Berkeley spent several years working as a secretary and tutor. In 1729 he traveled to America with the intent of founding a college in the Bermudas to train young men of various races for the ministry. He spent three years in America, mostly in Newport, Rhode Island. The money promised him by the House of Commons was not delivered upon and he returned to Europe. While in Newport, he built a home and became friends with the first president of Columbia University, Samuel Johnson, who was a philosopher and believed in Berkeley's doctrines (Popkin & Stroll, 1993; Scruton, 1995; Seymour-Smith, 1998).

The controversy between the empiricists and rationalists has continued. The underlying dispute is over the presence of *a priori* truths. Empiricists, such as Locke, attempted to prove that everything we understand (every idea) is revealed by tracing it back to experience. Leibniz, representing rationalists, contended that there are ideas whose content cannot be revealed by experience, but only by Reason alone. Additionally, Leibniz claimed that we can generate a system of truths from innate ideas whereby we know the universe as it really is, and not as it appears to be to our fallible organs of sensation. Into that knowledge we can then fit our experience; but it is not the experience that tells us what we mean.

Locke was not attempting to present a system of psychology, but simply to promote an empiricist theory of understanding. According to his theory, all communication depends on the common significance of words. Only referring to the experience that created the relationship between a word and the object or idea to which it

refers can identify the significance of words. Locke did, however, concede to a Cartesian concept of intuitive knowledge of certain truths, such as the truth that I exist.

Berkeley claimed to represent a philosophy that bridged the best elements of philosophical reasoning and common sense. He insisted that his theory was in agreement with empiricist and rationalist philosophers and that it did not lead to any of the skeptical or paradoxical conclusions involved in any previous theories of knowledge and reality. Although he was ridiculed by many of his contemporaries, later philosophers pursued his reasoning. Enlightenment philosophers carried the debate between rationalists and empiricists into the eighteenth century with a renewed interest in the basis of human knowledge (Popkin & Stroll, 1993; Scruton, 1995).

David Hume (1711-1776) agreed with Newton and Locke and yet pursued the reasoning of Berkeley, thereby exposing some of the limitations of all empirical theories of knowledge. Hume grew up in Ninewells, Scotland, near Edinburgh. He attended Edinburgh University, studied law for a short time, and turned his interests to reading. He discovered through his reading an endless dispute about the nature of truth. Determined to find a medium by which to establish truth, he went to La Fleche in France, where Descartes had studied, and there wrote his masterwork, *A Treatise of Human Nature* (1739-1740), which was an application of Newton scientific method to the mental world. Little notice was given to his first work. He rewrote much of its content in two more popular volumes: *An Enquiry Concerning Human Understanding* (1748) and *An Enquiry Concerning the Principles of Morals* (1751). Through his studies, Hume adopted empiricism and believed that science provided the means to examine the processes by

which people think, form their views, and come to believe what they do about the world around them.

Hume was never employed as a professional philosopher. In 1745 he applied for the chair of Ethics at Edinburgh University but was denied the post. His main ambition was literary fame and during his lifetime he was better known as a historian than a philosopher. Between 1754 and 1761 he wrote a six-volume history of England. Yet, he is noted as having injected philosophy with a strong dose of common sense. He is regarded as one of the supreme philosophers of the world. He was a genial man, well liked by all who met him. The Scottish economist, Adam Smith, described him as having come as near to perfection as any human being possibly could. It is unknown whether Hume was an atheist, but he did reject all forms of religion. He lived in France from 1763-1766 and became friendly with philosopher Jean-Jacques Rousseau and brought him back to England with him.

Hume's empirical examination of knowledge creation resulted in skepticism – doubting whether any of our beliefs can be adequately supported. However, Hume saw that this led to something very near nonsense. As an empiricist, Hume denied the existence of any innate ideas in the human mind at birth. The *Treatise on Human Nature* (1739-1740) begins by dividing the contents of the mind into two classes, impressions and ideas. Impressions are more forceful and vivid than ideas and include sensations and emotions. Ideas are what are involved in thinking and reasoning; they are copies of impressions.

Hume followed the theories of Locke in distinguishing simple from complex ideas, with simple ideas being derived from simple impressions. Complex ideas are then

built from simple ideas; therefore, all ideas can be traced back to the impressions from which they were derived. It follows then, that no term is meaningful apart from the impression from which the meaning was learned. Hume then advanced the theory of meaning, dividing all significant propositions into two types: empirical and logical. Empirical propositions derive meaning from experience. Logical propositions speak only of the relations between ideas. The example provided by Hume of logical propositions is the relation of ideas present in the sciences of geometry, algebra, and arithmetic. Conclusions established by logic, or pure reasoning, are empty. Even mathematics expresses nothing but the relations among ideas – its propositions are true only by virtue of the ideas expressed in them – they do not reflect experience.

Hume did not stop with declaring Reason empty – he went on to state that the only source of knowledge of matters of fact is experience. However, matters of fact do not necessarily generate truth, but simply summarize what happens to be true at the time and what *might* be otherwise. The ideas expressed in factual propositions are ultimately derived from the impressions that generated them. Thus, there can be no *a priori* proof of any matter of fact. For example, we cannot demonstrate or disprove that the world originated from God, or that we survive death, or that there are ‘substances’ that constitute reality behind the veil of appearance. The notion of God, according to Hume, arises through an association of ideas.

With Hume’s theory of knowledge he was able to extend Berkeley’s criticisms of Locke’s theories of ‘material substance’ and ‘abstract ideas’. Hume rejected material substance and its associated distinctions between primary and secondary qualities as superstition. He expended very little energy on the argument, claiming that there can be

no impression of material substance, therefore there can be no idea of it, and so the very term is meaningless. As for Locke's theory of abstract ideas, Hume held this to be absurd since everything that exists is both individual and determinate in all its properties – there is no such thing as a generality. He argued that individual ideas might 'agglomerate' so as to introduce the necessary element of generality.

Hume challenged the precepts of the scientific method in his explanations of causality and induction. According to Hume, the idea of cause is one of 'necessary connection'. He claimed there were actually no necessary connections in reality, but that we nevertheless have the idea of necessary connection. Simply stated, even though we may repeatedly view an event and derive from it an impression of necessary connection or causation there really is no such impression. If there were a regular connection between two events then the absence of the constant conjunction of the two would result in nothing to observe. The two are linked and no cause exists, the relation between the two can only be a matter of fact. However, we say that cause exists because of a constant conjunction between two events and this causes us to associate the idea of one with the impression of the other. Hence we are compelled to believe that one event will follow the other and this gives rise to the idea of necessary connection. It is not an impression of anything in the external world; it is simply a feeling that arises spontaneously within us.

Hume was not the first to criticize the concept of causation, but he pursued it at great length and with considerable rigor. Hume presented further problems for advocates of scientific investigation with his discussion on the problem of induction. Since the relationship between distinct objects and events is always contingent (not causal) then we can make no inference from past to future. It is perfectly conceivable, in Hume's

estimation, that an event that has always occurred within our period of observation and in accord to what we call the laws of nature, may not occur again. This raises a problem. Scientific laws state universal truths, applicable at all times and in all situations. If Hume is right, then there is no evidence available to finite creatures such as we are that can guarantee their truth.

Hume's scepticism threw into question our entire basis for objective knowledge of the external world. The imagination constantly constructs whole impressions from the fragmentary deliverances of sense perceptions. The resulting idea is like that of necessary connection, a product of custom and association. He also cast into doubt the Cartesian concept of self that had been readily accepted by other philosophers. Descartes was certain of his own experience, and therefore was able to exclaim 'I think, therefore I am'. But Hume asks who this 'I' is whose existence is so boldly proclaimed in all thinking. When he looks into his own mind, he finds only a collection of impressions, ideas, and activities. He finds no particular impression or idea that corresponds to the 'I' so confidently asserted by philosophers. The only 'I' he could find was one that consisted of the totality of his impressions and ideas. If the individual 'I' is merely a collection of impressions and ideas derived from experience, then the whole concept of morality was opened up to skeptical scrutiny.

Hume argued that every system of morality proceeds from ordinary reasoning into a series of propositions connected with an *ought* or *ought not*, which expresses a relation or affirmation. He asked how one could deduce a relation that lacks empirical evidence. According to Hume there is no deductive relation between an 'is' statement and an 'ought' statement. Referred to as Hume's law, this claim, if true, would seem to

undermine all claims to moral knowledge and leave ethics to the mercy of subjective whim.

Hume denied that there could be anything such as practical reason. For reason to be practical it must not only be applicable to practical matters, it must also be capable of generating practical conclusions. Aristotle argued, in *Nicomachean Ethics*, that practical conclusions are not thoughts, but actions. Reason, in its practical employment, must then produce action. Hume argued that Reason alone could not generate action – actions are generated by motives. All Reason can do is provide us with a means to a given end, it cannot persuade us to either adopt or reject those ends. Hume claimed that what we take to be practical reason is actually the working out of a means to satisfy desires that have their origin in passions, not Reason. He goes on to say that Reason is, and ought to be, the slave of passions. All practical reasons are relative to some antecedent desire; therefore, no amount of reasoning can persuade evil people to change their course of action except desires that already attract them.

Despite Hume's scepticism and his theories about ethics, he reflected the moral sentiment of his time. He insisted that there was a basic uniformity of sentiment among human beings stemming from their ability to sympathize with fellow human beings. There is no fact of the matter within this philosophy; it is nothing other than moral sentiments. He attempted to give an account of the complexity of moral feelings, relying on those provided by Aristotle and to some extent Spinoza. Hume promoted a balanced and dispassionate picture of the good life for man that reflected his naturalism and perception of humans as social beings. Unlike other skeptics who believed that humans only operate in accord with their own goals, Hume believed that there are occasions when

we can set aside our passions and our goals. We can then contemplate the world from a position of detached curiosity, as when we read a story or hear a case in court. In such cases our passions are not stirred for our own benefit, but on behalf of others. This sympathy is common to all human beings and informs our perceptions of the social world and tends to flow in a common direction (Haugeland, 1985; Kenny, 1998; Oldroyd, 1986; Popkin & Stroll, 1993; Seymour-Smith, 1998).

In 1764 Thomas Reid, the founder of the Scottish school of common-sense philosophy, published *An Inquiry into the Human Mind on the Principles of Common Sense* in response to Hume's *Treatise on Human Nature*. He followed this with two essays published in the 1780s on the intellectual and active powers of man. Like many of his contemporaries, Reid accepted Locke's theory of ideas. Upon reading Hume, he came to suspect there was something wrong with the empiricism of Locke and Berkeley and with their use of ideas in the system of Descartes. He was suspicious of the metaphysics of Berkeley and Hume and their claims that there is no such thing as matter in the universe, but only ideas in our minds.

Reid maintained that philosophers had corrupted the meaning of the word *idea*. He proposed that, in ordinary language, *idea* means an act of mind, to conceive something. Philosophers had a different meaning, where *idea* was not the act of conceiving something, but some object of thought. Reid claimed that *ideas* in the philosophical sense are mere fictions; that philosophers had confused conceptions with images and in so doing had started with the wrong set of precepts. Knowledge does not begin with concepts separate from beliefs; Reid claimed the reverse is true: we begin with natural and original judgements and then later analyze them into individual concepts.

Thus, upon seeing a tree, we do not receive a mere idea of a tree, but based on judgement, we determine that it exists with a particular shape, size, and position.

Reid was willing to accept Locke's concept of primary and secondary qualities. But unlike Locke, he credited secondary qualities as the real quality of objects; recognition of color is not a sensation of color that we have, it is its cause. No one, he claimed, thinks that the color of an object changes simply because we look at it through a colored lens. 'Red' means what the common man means by it, and its meaning cannot be changed by philosophers.

Reid regarded himself as an experimental scientist who favored the application of common sense to the solution of a problem. In his arguments against the immaterialism of Berkeley and the scepticism of Hume, he wanted to demonstrate that the realism of the common man was fully compatible with the pursuit of science and the experimental study of the mind (Kenny, 1998).

18th Century Continental Philosophy and Science –The Enlightenment Period

The Enlightenment was an eighteenth century phenomenon lasting throughout most of the century. Most of the writing of the eighteenth century shared several basic characteristics. First, they were marked by a confidence in the powers of human reason. This self-assurance stemmed from the accomplishments of science during the sixteenth and seventeenth centuries. Even though the details of Newton's physics were poorly understood, his methods provided a model for scientific inquiry into other fields of study. Men believed that nature operated according to laws that could be understood through observation and study.

Secondly, Enlightenment thinkers spent much of the eighteenth century translating, republishing, and thinking through the implications of the great works of the seventeenth century, especially Locke's *Essay Concerning Human Understanding*. Locke's theories of knowledge credited education and environment as primary contributors to the shaping of human character. As such, eighteenth century thinkers made education central to their goals of individual moral improvement and social progress. Voltaire called Bacon, Newton, and Locke his 'Holy Trinity'.

Third, the ambitions of eighteenth century thinkers were wide ranging. Intellectuals sought the organization of all knowledge. They pursued the scientific method (empirical observation) as a means to arrive at general laws in the study of human affairs as well as natural phenomena. They collected evidence to learn the laws governing the rise and fall of nations. They compared governmental constitutions to determine an ideal and universally applicable political system. They studied an array of subjects in a systematic manner: knowledge and the mind, economics, government, religion, customs of indigenous peoples of the New World, natural history, human nature, and the differences between gender and races.

While Hobbes and Locke published treatises for small groups of educated readers, the writers of the eighteenth century wrote plays, essays, letters, composed music, and wrote novels and history for a wide audience. The expansion of literacy and the growing market for books resulted in the development of a public sphere of influence. Enlightenment thinkers confronted their culture, exposing age-old practices, beliefs, and authority to the light of public scrutiny. They combined irreverence for custom and

tradition with a belief in the ability of humans to perfect themselves and a confidence in their ability to understand and control the world.

Enlightenment thought was a European phenomenon that included the European colonies in the New World. France, however, produced some of the most widely read books of the century and provided a world stage for the battle between Enlightenment thinkers and the old order. The death of Louis XIV in 1715 brought to a close Europe's longest single reign. His absolutist monarchy had raised France to a peak of glory, but his fervor for war and conquest brought about the decline of French power. Tired of Louis's wars, the French clergy, intellectuals, disaffected nobles, merchants, and even some military leaders like de Vauban criticized his monarchy. Following his death, French aristocrats quickly wrested control of public policy from the young king Louis XV in the spirit of social reform. The intellectual debates of the French Enlightenment were a natural reaction to the political and social morass created by the regime of Louis XIV.

During the minority years of Louis XV (1715-1723) his Regent, Duc d'Orleans and his tutor, Cardinal de Fleury (1653-1743), ran the government. During these years the only diplomatic crisis was the violent resurgence of the controversy over Jansenism, left over from the persecution of Jansenists by Louis XIV and the Catholic Church. The personal reign of Louis XV (1723-1774) was one of perpetual financial crises, recurrent wars, clashes between his court and Parliament, and feuds between religious factions. The chasm between the court and common people widened (Botsford, 1936; Coffin, Stacey, Lerner, & Meacham, 2002; Davies, 1996).

Many of the enlightenment thinkers, especially in France, were not philosophers in the sense of being highly original abstract thinkers, but were free thinkers. The French

word *philosophe* referred to a person whose reflections were unfettered from religious constraints or dogma. Although insisting on the overturn of the institutions of the past, the new liberals were optimistic in their naïve confidence in the perfectibility of man and his nature. Their literature outlines brilliant plans for the reorganization of the state, religion, society, and business. The literary revolt appealed not only to reason, but also to emotions and the whole gamut of human experience. The Enlightenment marks a shift of power from the Church and its scholars, to intellectuals who held themselves apart from the Church, many claiming to be deists, sceptics, or atheists. This shift, from ecclesiastic power to the power of the secular intellectual, has been a major factor in the shaping of the modern world.

The secular intellectuals proclaimed an interest in humanity and were just as ready as any ecclesiastic to tell mankind how to live and conduct its affairs. Intellectuals from the eighteenth century on have used a more radical approach than their clerical predecessors in order to encourage and support their agenda. And, contrary to mainstream seventeenth century thought that identified science as the fields of physics and mathematics, enlightenment thinkers adopted a sense-oriented approach to the pursuit of knowledge, greatly expanding the areas investigated through the scientific method. Bound by none of the collective knowledge of revealed religion, intellectuals selectively chose, based on their own good sense, what was best for mankind. For the first time in human history, man, apart from any revealed or innate wisdom from God, claimed the ability to diagnose and cure the ills of society (Botsford, 1936; Coffin, Stacey, Lerner, & Meacham, 2002; Johnson, 1988; Nodoushani, 2000; Stipp, Dirrim, & Hollister, 1972).

The first attack was made by Baron de Montesquieu (1689-1755), a lawyer, a member of the nobility, and a judge of the Parlement of Bordeaux. Montesquieu was not a stylistic writer, but a relatively cautious jurist. He did write a satirical novel, *The Persian Letters* (1721), but published it anonymously in order to protect his reputation. The novel was presented as an exchange of letters between two Turkish visitors to France. In the letters, the visitors discussed the odd religious superstitions they encountered and compared the French court and French absolutism to Turkish harems and despotism.

Montesquieu's treatise *The Spirit of Laws* (1748) was an empirical study exploring the structures that shape law. He explored how different environments, histories, and religious traditions combined to create a wide variety of governmental institutions. Montesquieu asked as to the 'spirit' present in each form of government and about the respective virtues and shortcoming of each. He described the soul or spirit of a republic as virtue; of monarchy, honor; and of despotism, fear. He promoted reason over tradition as the determinant for the form of government best adapted to meet the needs of a particular people. His own opinion was that the English type of limited, or constitutional monarchy, was best. It seemed highly advantageous, in his estimation, to separate the functions of government into three separate compartments, the legislative, the executive, and the judicial, rather than to blend them, as France had, in the person of the king. His idealization of checks and balances in government power influenced Enlightenment political theorists, members of the governing elite, and the authors of the United States Constitution (1787).

At the time, the best known of the *philosophes* was Francois Marie Arouet (1694-1778), who assumed the pen name Voltaire. Voltaire used a variety of literary forms to express his opinions on a large range of topics. Voltaire was born in Paris in 1694 and educated at the Jesuit College Louis le-Grand. In his early teens he was associated with the Societe du Temple, a group of free-thinking intellectuals. Fearful of the influence of the group, his father sent him off to work as a page for the French ambassador in Holland. He was summarily dismissed and sent home following an unsuitable love affair. His father then forced him to work in Law. Voltaire reacted by writing satirical lampoons, which earned him an eleven-month stay in the Bastille. While there he wrote his tragedy *Oedipe*, successfully producing it in 1718. He immediately found favor in the court, became the favorite of princes, and the idol of the intelligentsia. His initial success was short-lived. He contracted smallpox, which disfigured him. He insulted an influential chevalier and was sent back to the Bastille for a couple of weeks. He then left for England where he spent three years in exile.

While in England he became an admirer of British political institutions, British culture, and British science. Most notable, he became an extremely persuasive convert to the ideas of Bacon, Newton, and Locke. While in England he mastered the language, studied British literature, and associated with many of the leading thinkers in British society.

Voltaire returned from England in 1729. Back in France he championed and helped to popularize Newton's work, British empiricism, and the scientific method. In 1734 he published *Lettres Philosophiques*. The *Letters* made an immediate sensation. His themes were religious and political freedom. To make his point he compared France and

other absolutist countries to the politics and culture of Britain. He praised the Anglican Church and the Quakers (who impressed him by their devotion to actual religion rather than the show of religion), the English system of government, the British respect for scientists and their support of research, and English literature. *Letters* was an attack on the French system. In one of the more inflammatory passages in the book, he claimed that in Britain violent revolution had actually produced political moderation and stability. He praised Britain for its religious toleration, bringing together citizens of difference religions in a harmonious, productive culture. In this, as in other comparisons, Voltaire oversimplified. In fact, in Britain, Catholics, Dissenters, and Jews did not have equal civil rights. Yet, in comparison to the intolerance of Louis XIV toward Protestants, the British stood out as paragons of toleration. *Letters* was publicly burned and Voltaire found himself forced to retreat to the country estate of his mistress Madame de Chatele, where he remained until 1749.

Of all forms of intolerance, Voltaire despised religious bigotry most of all. He denounced religious faith in miracles as superstition. He did not oppose religion, he believed morality came from God – he opposed religious fanaticism, including elaborate rituals, dietary laws, formulaic prayers, and church bureaucracy. Voltaire was a deist and advocated a simple religion.

In 1762 the Parlement of Toulouse convicted Protestant Jean Calas of murdering his son. Catholic-Protestant tensions were near breaking point in the region. Witnesses claimed that Calas' son wanted to convert to Catholicism; they convinced the magistrates that Calas had killed his son rather than allow him to leave the Protestant faith. French law stipulated the punishment for the crime. Calas was tortured twice, first to get him to

confess, and again in order to get him to name his alleged accomplices. The torture was horrifying – his limbs were slowly pulled apart, gallons of water poured down his throat, and he was publicly tortured on the wheel, each of his limbs being smashed by an iron bar. Throughout the ordeal, he maintained his innocence. The executioner then beheaded him. Two years later the Parlement reversed its verdict, declared Calas not guilty, and offered payment to his family in compensation.

Voltaire was one of those appalled by the trial, the verdict, and the punishment. Using his fame as a forum, Voltaire went to work to clear Calas' name and bring the case to the public eye, sounding a cry for reform. He contacted friends, hired lawyers for the family, wrote briefs, letters, and essays expounding on the injustice suffered by Calas and his family. Voltaire decried the centuries-old practice of torture to uncover 'truth' and the legal proceedings that included secret interrogations, trials behind closed doors, and summary judgment without the benefit of appeal. Calas was executed the day after being convicted, without a review of his sentence by a higher court. Voltaire claimed that the entire process defied reason, morality, and human dignity. He pointed out that even a criminal is a man, and that the courts were accountable for Calas blood.

Although Voltaire spoke out against the atrocities of the French government, he was neither a populist nor a democrat. His ideal was the rule of an enlightened despot. He cared most about freedom of speech. Voltaire's published works, which fill over 100 volumes, were widely read. While he epitomizes the rebellion of the eighteenth century thinkers against the beliefs and systems of the old regime, he did not advocate revolt. He was an advocate of social reform.

Voltaire enjoyed his status as a critic and never tired of it; as a result he was regularly exiled from France and other countries. King Louis XV of France tolerated him due to his popularity. He had an attentive international audience and was invited to the courts of Frederick of Prussia (who he insulted and was forced to flee), and Catherine of Russia, with whom he carried on a correspondence about possible reforms in Russia. He returned to Paris in 1778 to attend the performance of his last tragedy, *Irene*. He was too ill to return to his home at Ferney and died in Paris (Botsford, 1936; Coffin, Stacey, Lerner, & Meacham, 2002; Kenny, 1998; Seymour-Smith, 1998).

The writings of Voltaire and Montesquieu represent the themes and styles of the French Enlightenment, but *The Encyclopedia*, a collective venture of a number of writers represents the breadth of the philosophical, scientific, and technical knowledge of the eighteenth century. *The Encyclopedia* edited by Denis Diderot (1713-1784) and Jean le Rond d'Alembert (1717-1783), was produced in seventeen volumes of text and eleven of illustrations and was published in installments between 1751 and 1772. It included contributions from Voltaire and other French thinkers of the time and attempted to bring together all of human learning into a single work. It demonstrated how scientific analysis could be applied to nearly every realm of thought.

Diderot commissioned articles that explained the recent achievements in science and technology, including those that explained the working of machines and illustrated new industrial processes. The purpose was the demonstration of how everyday applications of science could promote progress and reduce human misery. There were articles on religion, politics, and the foundations of the social order including economics, taxes, and the slave trade. Censorship made it difficult to write openly anti-religious

articles, but the lead Censor, Chretien-Guillaume de Lamoignon de Malesherbes, looked favorably on the work.

The prevailing viewpoint expressed throughout *The Encyclopedia* is deist; God created the universe and gave it fixed laws, but was uninvolved in human affairs. Articles on Christianity, Faith, and Providence were written from a deist perspective. Many of the articles were aggressively opposed to Christianity. Diderot found subtle and not so subtle ways to denigrate the Church. In the entry on the Eucharist, Diderot added a cross-reference: “See *cannibalism*”. Caustic comments like this created public controversy when the early volumes of *The Encyclopedia* appeared. The French government revoked permission to print any additional copies or volumes, declaring that the Encyclopedists were trying to ‘propagate materialism’ (atheism) and to destroy religion, to inspire a spirit of independence, and to corrupt morals. Although banned and expensive, the volumes continued to be produced. Purchasers were scattered throughout Europe and included the aristocrats, government officials, prosperous merchants, and members of the higher clergy (Coffin, Stacey, Lerner, & Meacham, 2002; Davies, 1996; Kenny, 1998).

The Enlightenment was an international affair. Although French was the predominant language of the Enlightenment, the principles of the Enlightenment thinkers spread across Europe. Common themes of the period included humanitarianism, the dignity and worth of all individuals, religious toleration, and liberty. The Italian jurist Cesare Beccaria (1738-1794) published *On Crimes and Punishments* (1764). In his publication Beccaria attacked the prevalent view that punishments for crimes should represent society’s vengeance on criminals. He proposed legal reforms, arguing for laws that provided the greatest possible leniency compatible with deterrence, respect for

individual dignity, and punishment no more stringent than necessary. He presented an eloquent argument against the use of torture and the death penalty, especially public executions.

In 1766, just four years after the Calas case, another French trial provided an example of the abuse of state power that appalled Beccaria and the other *philosophes*. A nineteen-year old French nobleman was convicted of blasphemy. Before being burned at the stake, his tongue was cut out and his hand cut off. During the trial the court discovered that he had read Voltaire's *Philosophical Dictionary* and ordered it burned with the body. Sensational public executions like this increased the popularity of Beccaria's book, which was translated into a dozen languages. His book is credited with the movement of legal reform that swept Europe. By the early nineteenth century most European countries abolished torture, branding, whipping, mutilation, and reserved the death penalty for only capital crimes.

Enlightenment thinkers spoke almost unanimously in favor of the elimination of religious warfare and persecution. While opposed to the organization and dogma of the church, most of the *philosophes* accepted religious beliefs. Only a small number were atheists or agnostics. Many were deists, adopting Newton's view of God as a divine clockmaker who set the universe in motion and then left it to run on its own. Conversely, these same leaders of the intellectual elite commonly viewed Judaism and Islam as backward religions laden with superstitions and meaningless rituals. There were only a few Enlightenment figures who treated Jews sympathetically. An exception was the relationship between German *philosophe* Gotthold Lessing (1729-1781) and his Jewish friend Moses Mendelssohn (1729-1786), a self-educated rabbi and bookkeeper. The two

of them presented the Jewish religion as a viable means to know God. Mendlesohn also promoted reform within the Jewish community, arguing that they should embrace the projects of the *philosophes* and the promotion of religious tolerance (Coffin, Stacey, Lerner, & Meacham, 2002).

Two movements took place during the Enlightenment. The first was a revolt of intellectuals who claimed a rationalist approach to solving the problems of society, with Voltaire as the recognized leader of this revolt. The second movement was the elevation of nature and the common man. Jean Jacques Rousseau is the recognized leader of this movement.

Jean Jacques Rousseau (1712-1778) was a rebel among the Enlightenment thinkers, quarreling with many of them and contradicting many of their assumptions. Rousseau taught distrust of the rise of a materialist culture and advocated a return to nature. He rejected the Enlightenment and insisted that reason itself had severe limitations as a means to cure the ailments of society. He proclaimed his right to reject the existing order and to replace it with a system of his own devising, where the political process and the State replaced the role of the parent, family, and church in the education and molding of society. He believed he held a unique love of humanity, and that he possessed an unprecedented gift and insight by which to save humanity from the march of materialism. An astonishing number of people in his own day and since have accepted his advice on his own merit.

Rousseau's writing made a significant impact on the development of French thought in the eighteenth century. His novels and treatises were widely read and immensely popular. His work also resulted in his relocation on a frequent basis in order

to escape arrest or retaliation, which may have contributed to his noted paranoid personality.

Rousseau was born in Geneva and raised as a Calvinist. At the age of sixteen he ran away from home and met Vaudois Madame de Warens, who became his benefactress. Madame de Warens, who was twelve years older than Rousseau, eventually became his mistress and converted him to Catholicism. He lived with Madame de Warens from 1731 until 1740, during which time he read the works of great philosophers. In 1741 Rousseau met a servant girl, Therese Le Vasseur, with whom he stayed for the rest of his life, marrying her in 1768. In his *Confessions*, he admits to having five children with Therese and to placing all five of them in the orphanage of the Enfants-Trouves.

His first job in 1743 was as secretary to the French ambassador in Venice. After quarreling with the ambassador he moved to Paris, where he met Diderot and Voltaire. Diderot introduced Rousseau to the Encyclopedists. Rousseau's contributions to the *Encyclopedia* were mostly on musical subjects and one on political economy. In 1750, with the encouragement of Diderot, he submitted an essay to the University of Dijon and won a prize. The essay attacked the idea that the arts and science were good for the human soul. Rousseau found himself famous overnight. Though successful, he lacked the social graces to excel in the social circles of the Paris elite. In 1754 he returned to Geneva, and officially to the Calvinist faith.

After a quarrel with Voltaire in 1754 Rousseau returned to France. In 1755 he wrote *Discourse sur l'inegalite* (Discourse on Inequality) in which he portrayed an idyllic image of primitive man and blamed prosperity for all the problems inherent in political and social relations. The *Discourse* provoked the ire of both the radicals and the

conservatives. The novel *Julie ou la nouvelle Heloise* (1761) was a love story that became immensely popular and widely read, especially among women. *Julie* went through seventy editions in three decades. Rousseau's fellow *philosophes* ridiculed the novel, labeling it hysterical and obscene. The appeal to the public was the love story, wrapped in tragedy, and through which Rousseau expressed his conviction that humans are ruled by their hearts as much as their heads, placing passion over reason.

In 1762 Rousseau published two works, a treatise on education titled *Emile* and *The Social Contract*, a work of political philosophy. *Emile* outlined the way to raise a child and to avoid the artificial decadence of civilization. Rousseau advocated employing the native curiosity and other impulses of a child in order to help him develop intelligence and acquire learning. Reading should be postponed, and the discovery of rules permitted to arise from observation and reflection (in this way they are accepted as reasonable). As the child develops, training must be adapted to each phase of change. The book addressed domestic concerns (which pleased many readers) and religion (which angered Deists, Atheists, and Catholics). As the child Emile grew to manhood, Rousseau (as his tutor) introduced him to the idea of love and marriage. He taught Emile that sex, love, and marriage are necessary parts of his journey toward perfection. He fused sexuality and morality, demonstrating that the love of a woman will amplify a man's duty to humanity. He described religion as a feeling, placing it among the passions. Visible nature gives witness to the living God. He reminds the reader that two-thirds of mankind is neither Christian, Jew, nor Mohammedan, and that God is the God of all mankind, therefore, all the claims by religion as to His demands and His judgments are imaginings. God asks only that we love Him and pursue good. Religious warfare is the vilest form of

impiety. The book *Emile* was condemned by the bishop of Paris for teaching men to bypass the Church and for implying universal salvation and the absence of original sin

In *The Social Contract* Rousseau appealed to the masses, claiming that the governed granted power to the ruling class. Like Hobbes, he believed that society originates when life in the original state of nature becomes unbearable and men find a need to group together. But, whereas Hobbes believed that man is inherently self-centered and morally neutral, Rousseau supposedly believed in the natural goodness of man. Based on that goodness, he proposed that a social contract be drawn up, engaging the entire community in the protection of each member's person and property. Every member therefore subjugates his rights to the community. In this community, every individual as a citizen shares in the sovereign's authority and is provided civil liberty, which permits the stable ownership of property.

The ideas presented in *Emile* and *The Social Contract* angered the Church and the monarchy; Rousseau was forced to flee to Switzerland in 1762. He was subsequently also driven out of Geneva. In 1776 he was taken in by David Hume and moved to England. Hume secured him a pension from King George III. Soon his paranoid ingratitude wore on the patience of the kindly Hume and Rousseau returned to France in spite of the risk of arrest. He spent the last years of his life poor and ostracized. When he died in 1778 some thought he killed himself (Barzun, 2000; Coffin, Stacey, Lerner, & Meacham, 2002; Davies, 1996; Froese, 2001; Kenny, 1998).

Rousseau's greatest historical impact on literature may be his *Confessions*, which are a vivid and detailed account of his life, including his failings. It paved the way for later autobiographies based on candor and self-examination and marked the beginning of

the Romantic Movement and of modern introspective literature. For the first time, readers were privy to the inner workings of the heart. The fresh, outwardly frank approach that Rousseau employed belied the underlying guile with which he conducted his personal affairs. Although not published until after his death, he began public reading of *Confessions* in 1770-71. The salons, public-gathering places for intellectual discourse, were packed for his readings, which at times lasted fifteen to seventeen hours, with breaks for meals.

There were many detractors who spoke out against Rousseau, his principles, his lifestyle, and his deception. In his day, his detractors were all people who, at one time or another, were his friends or benefactors. Rousseau had an amazing capacity to turn on, and to attempt to destroy, the people to whom he owed the most. These men and women claimed that his candor was not honesty for the sake of honesty, but was actually part of his ploy to position himself as the most virtuous man ever born. In his public readings of *Confessions* he made unsubstantiated accusations against his benefactors. One of his victims, Madame d'Epainay, requested that the authorities stop his ranting. Rousseau agreed to desist, but continued, adding that "[whoever] examines with his own eyes my nature, my character, morals, inclinations, pleasures, habits, and can believe me to be a dishonest man, is himself a man who deserves to be strangled" (Rousseau, as cited in Johnson, 1988, p. 16). Once again, he turned the tables on his benefactors and elevated his own sense of morality.

Rousseau managed to elevate ingratitude to the level of a positive virtue. He persuaded himself that he was the best of moral human beings. He sought the advantage in all personal dealings, and justified his behavior as appropriate – people gave and he

quite willing took. He had an amazing ability to turn the tables so that anyone who helped him was in fact in his debt for having done so. He played his poverty against the riches of the new middle class, employing guilt as a means to gain support. His technique was powerful and effective.

Rousseau set people up so effectively that he could gain an invitation through manipulation of peoples' sympathy. He would emphasize his difficulties and poverty; when someone offered assistance he would feign offence and indignation that they could read into his comments any plea for help. With the tables thus turned the would-be benefactor was obliged to re-formulate his or her invitation into Rousseau's terms. Those terms required much from the host and nothing in return from Rousseau, including common courtesy.

In addition to his disagreeable personality, Rousseau added the complexity of a deep-seated paranoia. He became convinced that an intricate plot had been devised to undermine him. He decided that the conspiracy against him began, when at the age of sixteen, the Comtesse de Vercellis had employed him. He quarreled with Voltaire and Diderot, both of whom had at one time been ardent supporters. Believing himself the victim of an international conspiracy, he accused David Hume of being the mastermind of a plot to hold him prisoner in England. Upon his return to the Continent, he pinned posters to his front door listing the various groups who were conspiring against him: priests, intellectuals, commoners, women, the Swiss, etc. He became convinced that Hume had handed over the international conspiracy against him to the Duc de Choiseul, France's Foreign Minister. At the time of his death, he was convinced that thousands of

agents were after him. His persecution paranoia was reflected in his last works, *Dialogues avec moi-meme* (begun in 1772) and *Reveries du promeneur solitaire* (1776).

It is a curious note that Rousseau expressed an interest in children that was not exhibited in his own life. Part of Rousseau's reputation rests on his theories on the raising and education of children. There is no evidence that he ever studied children to verify his theories. In fact, his conduct regarding his own children is appalling and is important in understanding the development of his political theory. He fathered five children by Therese, the first one born in the winter of 1746-47. Rousseau turned every one of his children, unnamed, over to the Hospital des Enfants-trouvés. It is unlikely that any survived. A history of the institution, which appeared in the *Mercure de France* in 1746, described the problems the hospital faced in caring for the more than 3,000 infants abandoned to its care. In 1758 Rousseau himself commented that the number had risen to 5,082. In 1772 the hospital took in nearly 8,000 infants. Two-thirds of the infants died within the first year and only fourteen out of one hundred survived to age seven. Most of those who survived were destined to a life of poverty and begging. It appears that Rousseau never took any interest in his five children, failing to even note the dates of their births in any of his writing.

Rousseau was attacked for his behavior and found it necessary to defend his actions in a series of private letters. In 1764 Voltaire, angered at Rousseau's attacks on his lack of religious beliefs, wrote and published an anonymous tract titled *Le Sentiment des Citoyens* that openly accused him of abandoning his five children. In brooding over his defense Rousseau developed his educational and political theory, which advocated the State as the only appropriate parent for the raising of children. In *Emile* he advocated

raising a child without prejudice according to his nature. In his *Social Contract* he claimed that the State must form the minds of all; therefore, the orphanage provides the avenue for the production of a future totalitarian state.

Despite his paranoia and his disagreeable personality, Rousseau became one of the most influential writers who ever lived. He presented himself as a champion of truth and virtue and as a friend of all humanity. He was, and still is, considered as such on the merit of his own words. His skill as a writer is astounding. His self-accusations served to strengthen the subsequent accusations against his enemies and make them more convincing. He could present a loathsome act on his part in such a way that the reader ends up sympathizing with him and crediting him with a forthright honesty. A close reading of his works reveals that his candor was less than honest; several times he gave different accounts of the same event, revealing his ability to turn events to his advantage as it suited his needs at the time.

The personal accounts of his benefactors reveal a character other than the one Rousseau presents of himself. However, during his life he never found it difficult to find new admiring benefactors. His writing proved to hold a strong intellectual and emotional appeal, impacting the lives of readers in his day as well as future generations. Great intellectuals and authors such as Immanuel Kant, Percy Shelley, John Stuart Mill, George Eliot, Tolstoy, and Claude Levi-Strauss admired him. His work marks the beginning of the modern sensibility (Johnson, 1988).

Intellectuals who admire the writings of Rousseau credit him as the founder of modern education, claiming that “he did more to improve education through his writing than did any other man of his time” (Johnson, Collins, Dupuis, & Johansen, 1969, p.

216). European educators adopted Rousseau's theories and put them into practice.

Rousseau is recognized as a literary genius. His political philosophy was adopted by the government of Corsica (until it fell) and influenced the authors of the American Constitution. And, although his merits as a philosopher are debated, he played a significant role in influencing the thinking of modern philosophers (Forese, 2001; Johnson, 1988; Johnson, Collins, Dupuis, & Johansen, 1969).

Enlightenment thinkers left mixed messages on issues related to gender and slavery. Many writers developed and popularized arguments about natural rights. Yet they also elevated natural differences in gender and race by suggesting that nature should dictate different, and possibly unequal, roles. Rousseau, who argued against despotism and slavery, still advocated unequal rights for women.

Rousseau's sharpest critic was the British writer Mary Wollstonecraft (1759-1797). Her best known work, *A Vindication of the Rights of Woman*, was published in 1792. Although she admired Rousseau's political views, his writing, and his influence, she disagreed with his position on the role of women. In *Emile* Rousseau outlined the role of women. Claiming that women lacked the mental abilities of men regarding intelligence and reason, but crediting them with more wit and powers of observation, he encouraged women to use their charms for the purpose of supporting and manipulating their husbands. Wollstonecraft extended Rousseau's arguments against male inequality and the artificial distinctions of rank, birth, and wealth to include distinctions of gender. She argued that women (1) had the same innate capacity for reason and self-government as men; (2) virtue should mean the same thing for both men and women; and (3) that relations between men and women should be equal.

Mary Wollstonecraft was one of the few who applied the radical Enlightenment critique of the monarchy and inequality to the family. In the late eighteenth century, marriage laws deprived married women of property rights and gave a husband the right to rule his wife. She accused society of pandering to women and weakening them through false refinement. As Rousseau applied the state of nature as a means of perfecting man, Wollstonecraft claimed that a woman closer to the state of nature was stronger, being weakened only by societal influence. Rousseau, on the other hand, recommended for women the very same culturalization that he claimed as the cause of weakened men. Women in the eighteenth century were taught manners, grace, and seductiveness in order to win a husband; trained by society to be dependent creatures. Wollstonecraft claimed that a culture that encouraged feminine weakness produced women who were childish, cunning, cruel and vulnerable. Mary's life was the antithesis of cultural influences.

Wollstonecraft was born in London in 1759 to a poor household. During her life she worked in most of the professions open to women in the eighteenth century: paid companion, governess, school-keeper, teacher, social commentator, and writer. Her first publication, *Thoughts on the Education of Daughters* (1787), was a pragmatic presentation advocating the education of women. Her first novel, *Mary: A Fiction* (1788), was inspired by the death of a close friend.

After losing her job as a governess Wollstonecraft moved to London where her publisher, Joseph Johnson, introduced her to many of the English elite, including William Godwin, Thomas Paine, the painter Henry Fuseli, and William Blake. Following her passionate tendencies, she fell in love first with Fuseli and then in 1793 she met and fell in love with Captain Gilbert Imlay. She lived with Imlay in Paris during the French

Revolution, and bore him a daughter (Fanny) in 1794 before he abandoned her. After attempting twice to end her own life she met with Godwin in 1795, after which her life began to improve. Godwin and Wollstonecraft married and he remained devoted to her. She died in 1797 while giving birth to their daughter, who later became the famous writer Mary Shelley. Godwin dedicated much of his time to the memory of her and to printing her writings, including a collection of personal letters Wollstonecraft had written to him.

In contrast to her advocacy for equal rights, Wollstonecraft advocated a natural division of labor based on the sexes, and that a woman's foremost duty was mothering and educating children. She claimed, however, that these duties fall into place naturally and should not be accomplished via coercion or manipulation. Like others of her time, she wrote about the issues of property and education for middle-class women. Her hints that women might have political rights were considered scandalously radical (Coffin, Stacey, Lerner, & Meacham, 2002; Seymour-Smith, 1998).

Under the influence of the Enlightenment, religious teaching in schools was separated from general education. Rousseau's writings on education in *Emile* and *Considerations sur le gouvernement de Pologne* (1769) were used to create educational reform in France, Poland, and other areas of Europe. In the treatise written for Poland, at the request of Polish reformers, Rousseau recommended the creation of a single unified educational system in place of all the existing institutions. The King of Poland, Stanislaw August Poniatowski, followed Rousseau's recommendations to the letter. Over the next twenty years the National Education Commission created 200 secular schools. Teachers were trained. Textbooks in Polish were created by ex-Jesuits on literature, science, and languages.

In France, Enlightenment ideals were institutionalized in the new *Ecoles centrales*. The school was founded on three guiding principles. The first principle is the elimination of error by close correlation of the meaning of words with the sensation that forms the base of words. The second principle is the elimination of prejudice and superstition through understanding of the physical and sensible world. And thirdly, the creation of a moral and social order based on a rational, materialistic, and utilitarian concept of man and society (Nodoushani, 2000).

The ideas of the Enlightenment were used for different purposes across the world. In Poland, Enlightenment ideas led to educational reform. In the Netherlands and in Britain, Enlightenment thinkers helped to create a liberal political wing. In France, and to a lesser degree in Spain and Italy, the Enlightenment thinkers opposed the old regimes. In many parts of central and eastern Europe, the rulers adopted Enlightenment ideals in an attempt to improve their empires. Nonetheless, by the late eighteenth century, when most of the *philosophes* had died, the rationalism of the Enlightenment period had run its course. Pure reason had failed to cure the social ills of the day and was considered inadequate in its limitations to explain the world and the nature of man.

Enlightenment thinkers promulgated the ideas that fostered the revolutions of the late eighteenth century. In addition to their thinking, the *philosophes* created an environment for international exchange of thought. Enlightenment thought was not just embodied in books. In France, the middle class engaged in the debate. Salons emerged, hosting new networks of readers and new forms of sociability and discussion. Salons were informal gathering places, usually well connected, and were typically organized by learned aristocratic women. The prominent role of women in the salons provided women

with an avenue for learning that was not open to them in academic circles. Salons brought learned men and women together with members of the aristocracy for conversation, debate, food, and drink.

Occasionally, men hosted salons. Marquis de Condorcet (1743-1794), the secretary of the Academie des Sciences, turned his home into a salon. His visitors included such men as Thomas Paine, Thomas Jefferson, and Adam Smith. A constitutional monarchist at the start of the Revolution, Condorcet helped to write the French constitution in 1791. Condorcet is credited with pioneering a discussion on the necessity and possibility of applying the scientific method of discovery to the social sciences. As the Revolution progressed, Condorcet was jailed and died in prison during the Terror of 1794. During his last few weeks, while hiding from the revolutionary authorities, he wrote *Sketch of the Intellectual Progress of Mankind*, in which he predicted the spread of the Enlightenment. He foresaw a perfected state of man in a world of equal states and equality of individuals – the existence of the perfected state being accomplished through democratic revolution, technology, and the accumulation of knowledge (Nodoushani, 2000; Stipp, Dirrim & Hollister, 1972).

Following the lead of the French, salons were sponsored in London, Vienna, Rome, and Berlin. Similar societies formed throughout Europe and the colonies. Masonic lodges, academic societies, and scientific societies all catered to the elites of society. Other networks were less exclusive. Coffeehouses grew up around the colonial trade in sugar, coffee, and tea and served an important role in the circulation of ideas. The expanding realm of thought introduced during the Enlightenment opened up exchange on topics other than religion. The ability to think critically and speak openly without

deferring to tradition or religion was a point of pride. The widespread dissemination of books promoted a higher literacy rate, which thereby expanded the circles of reading and discussion in the public sphere. These discussions, in turn, began the change in politics. Governments now had to deal with a new phenomenon – public opinion.

By 1789 twenty percent of the European population lived in France. France was considered the center of European culture. Great Britain, however, was regarded by the *philosophes* as the most stable and moderate of countries; they often held French government up in comparison to the English system and found France lacking. The fact that the American colonies, who France supported, were at war with Britain in a bid to break free of British rule was disturbing. It made Frenchmen consider their predicament – if the American colonists considered the British king to be a tyrant, then how should they classify the other monarchs of Europe? Americans were in arms over the lack of representation in the British Parliament when other European countries did not even have a parliament. Americans were rebelling over a small tariff in comparison to the gigantic tariffs imposed on international trade within Europe (a product of mercantilism). In addition, French support of the Americans placed a financial strain on the country to the point of bankruptcy. The words penned by Thomas Jefferson in the first draft of the *Declaration of Independence* sent shock waves throughout Europe:

We hold these truths to be sacred and undeniable: that all men are created equal and independent, that from their equal creation they derive rights inherent and inalienable, among which are the preservation of life and liberty, and the pursuit of happiness – Jefferson, 1776

With the creation of the United States of America in 1789 and the inauguration of the first President, George Washington, debates about modern government were brought to the forefront. Aristocrats resented monarchical encroachment in their domains. Members

of the middle class resented the system of official privilege that excluded them from aristocratic circles. Peasants resented the government and a society that gained wealth at their expense.

The French Revolution stretched across a series of events that occurred between 1789 and 1799. Between 1789 and 1792 the struggle was constitutional and relatively peaceful. An increasingly bold and elite segment of society voiced their grievances against the king, refusing taxation without representation and proclaiming enlightenment inspired programs to rejuvenate the nation. Louis XIV supported many of the early reforms and initiated a number of his own. In the spring of 1789 two events set off the powder keg that was lying beneath the niceties of Paris social life. The winter of 1788-89 was exceptionally hard. The combination of a cold winter, the poor economy created by a bankrupt government, rising prices, and lack of work produced a climate of dissatisfaction. The bankrupt government decided to convene the Parlement at the Estates-General for the first time in 150 years. The expectation on all sides was that financial relief for the government would be granted in exchange for government favors related to local grievances. The elected delegates from each province showed up in Paris with their catalogues of complaints, ready to negotiate with the king. The Parlement was scheduled to convene on May 4, 1789.

In the last week of April, 1789 a rich manufacturer named Reveillon dared to make a public statement that his workers could live well on half of what he paid – his house was immediately surrounded by protestors. On the first day, the angry crowd destroyed several buildings. On the second day, soldiers of the Regiment du Royal-

Cravatte were brought in to protect the property. When the crowd began to throw things at the soldiers they opened fire, killing 300 people.

News of the massacre awaited the delegates to the Estates-General. The three orders of clergy, nobility, and Third Estate were supposed to meet separately. The division of the three orders was a residual of medieval times that separated the classes of French society. These, however, were new times. The Third Estate quickly realized that they could control the proceedings if they could get the clergy and nobility to join them as one body. The two orders agreed. The Third Estate broke the existing rules and declared itself to be the sole National Assembly. On the third day, the king locked out the Assembly. Refusing to be turned away, the members of the new National Assembly, along with a handful of sympathetic nobles and clergymen, moved to a nearby indoor tennis court. Here, under the leadership of the aristocrat Mirabeau and the radical clergyman Sieyes, they took a solemn oath not to disband until they drafted a constitution for France. In effect, the Assembly claimed the authority to remake the government in the name of the people.

The situation escalated. The royal garrison joined forces with the people. On July 13 a Committee of Public Safety was created – 48,000 men enlisted under General Lafayette. On the 14th the royal fortress of the Bastille was besieged; after a brief exchange of gunfire, the governor surrendered – Paris was taken over by the insurgents. On the 17th of July, to the surprise of many, Louis XVI traveled from Versailles to Paris to meet with the delegates. On June 27 Louis virtually conceded the right of the people to remake the government and ordered all delegates to join the National Assembly. In

September of 1789 the Assembly issued its charter of liberties, *The Declaration of the Rights of Man and Citizen*. The opening sentence set the tone for the declaration

The representative of the French people, organized in National Assembly, considering that ignorance, forgetfulness, or contempt of the rights of man, are the sole causes of the public miseries and of the corruption of governments, have resolved to set forth in a solemn declaration the natural, inalienable and sacred rights of man, in order that his declaration, being ever present to all the members of the social body, may unceasingly remind them of their rights and duties (The Declaration of the Rights of Man and Citizen 1789/2001).

The *Declaration* proclaimed that all men are born free and remain free and equal in rights. It declared property, liberty, security, and resistance to oppression to be natural rights. It declared freedom of speech, religious toleration, and liberty of the press inviolable. The source of sovereignty was in the body of the people as a nation. No one was to be accused, arrested, or detained, except in accordance with the due process of law, and every man was to be presumed innocent until pronounced guilty. These ideas represented the outcome of the Enlightenment discussions and debates. The *Declaration* became the preamble to the new constitution, which the Assembly finished in 1791.

Although peace was achieved in Paris and the work of remaking the government was underway, the news of the fall of the Bastille triggered a revolt throughout the country. Castles and abbeys were sacked and burned; noble families emigrated in the face of attacks by hungry peasants. Rumors of aristocratic plots and peasant atrocities were rampant. France divided into armed camps.

Unlike the unified public opinion that culminated in the U.S. Constitution, the early stage of the French Revolution did not produce a stable system designed around one constitution. Reforms met with resistance and divided the country. The Assembly framed a Constitution that distinguished between active and passive citizens. Active citizens,

who paid a certain amount of taxes, were allowed to vote and hold office. Only about half of the adult males in France qualified as active citizens. Active citizens could only vote for electors whose property ownership qualified them to hold office. Those electors then selected the delegates to the Assembly. Despite the changes, power was still a monopoly of the wealthy section of society.

The changes instituted by the new constitution created division in the country. Religious intolerance continued in areas of France. Jews were given civil rights as long as they renounced any separate identity. The Assembly abolished serfdom and banned slavery in continental France. It did not address slavery in the French colonies. The rights and roles of women became the focus of heated debates over the education of women and laws related to marriage, divorce, women's guilds, and poor relief. It was during the debate over the education of women that Englishwoman Mary Wollstonecraft wrote her book *A Vindication of the Rights of Women*, arguing that women should have equal rights to men. In France Marie Gouze, also known as Olympe de Gouges, became a proponent of women's rights. A self-educated butcher's daughter who became an intellectual and a playwright, Gouges wrote *The Declaration of the Rights of Woman and Citizen* (1791) in which she argued that only man, in all of nature, subjugated women. In colorful prose Gouges used the arguments of the Enlightenment as a defense for the rights of women. In her pamphlet Gouges chastised the authors of the French *Declaration of Rights* for their arrogance in presuming to speak for the rights of women

Man, are you capable of being just? It is a woman who asks you this question, at least you will not deny her this right. Tell me! Who has given you the sovereign authority to oppress my sex? Your strength? Your talents? Observe the creator in his wisdom, regard nature in all her grandeur, with which you seem to want to compare yourself; and give me, if you dare, an example of this tyrannical empire. Go back to the animals,

consult the elements, study the plants, then glance over the modifications of organized matter, and cede to the evidence when I offer you the means. Seek, search, and distinguish, if you can, the sexes in the administration of nature. Everywhere you will find them mingled, everywhere they cooperate in harmony with this immortal masterpiece.

Only man has fashioned himself a principle out of this exception. Bizarre, blind, bloated by science and degenerate, in this century of enlightenment and wisdom, he, in grossest ignorance, wishes to exercise the command of a despot over a sex that has received every intellectual faculty; he claims to rejoice in the Revolution and claims his rights to equality, at the very least (Gouges, 1791, as cited in Coffin, Stacey, Lerner, & Meacham, 2002, p. 696).

Women were active participants in the revolution, joining clubs, demonstrations, and debates. Women were present in the market place and worked as artisans. The regime at the time celebrated women, but increasingly tied the image of women to the role of supportive mother, homemaker, and educator, not as an active participant in the political process.

Religion was the most divisive issue addressed by the Assembly. The goal of Church reform was to make the Catholic Church of France a national and civil institution. In 1789 the Assembly ordered the confiscation of Church property in France. In 1790 it enacted the Civil Constitution of the Clergy, requiring all bishops and priests to swear allegiance to the state rather than Rome; their salaries were to be paid out of the public treasury. Church reform further divided France. Areas loyal to the church rebelled. The pope threatened to excommunicate priests who signed the Civil Constitution.

In August of 1791, Prussia and Austria jointly issued the Declaration of Pillnitz, which vowed the reinstatement of the monarch in France as a matter of common interest to all sovereigns of Europe. Fearful of losing political support in France, the leaders of the Assembly declared war against Austria and Prussia on April 20, 1792. By 1792 the

allied forces of Austria and Prussia were within reach of Paris. Many, including soldiers, suspected King Louis XVI and his followers of collusion with the enemy. On August 10 radical leaders organized Parisian crowds and led them in an attack on the royal palace, killing all of the King's Swiss Guard. The king took refuge in the meeting hall of the Assembly. The radicals seized control of the municipal government in Paris, replacing it with the Commune. The Commune demanded that the Assembly suspend the king from his duties and hand him and his family over for arrest. In September, a rumor spread that political prisoners were planning an escape; Paris crowds responded by conducting hasty trials and sentencing execution for more than one thousand supposed enemies of the Revolution. In December, King Louis XVI was tried and condemned to death. He was beheaded in a public display on January 21, 1793. His wife, Marie-Antoinette, was executed in similar manner in October 1793. His son, the ten-year-old Louis XVII, was handed over to foster parents and later died from neglect and tuberculosis.

The reigns of control passed through the hands of several rebel leaders. France was at war with itself and its neighbors. In 1799 a coup d'état was engineered by Napoleon Bonaparte (1769-1821) and the former revolutionary champion of the Third Estate, Abbe Sieyes. Bonaparte was declared a temporary consul, assumed the title of First Consul, and governed in the name of the Republic. The Revolutionary government stabilized under the leadership of Bonaparte, who declared himself Emperor in 1804 and united France under his mission to conquer the world. The French managed to replace an enlightened despotism with a dictatorship (Barzun, 2000; Coffin, Stacey, Lerner, & Meacham, 2002; Davies, 1996; Stipp, Dirrim, & Hollister, 1972).

German Philosopher Immanuel Kant

Immanuel Kant (1724-1804) was the first of the noted German philosophers. He lived all of his life in Königsberg, the town of his birth, in what was then eastern Prussia. Raised as a Pietist (a movement similar to Quakerism or Methodism in England) he later adopted more liberal theological views. As a young man, the family pastor, Franz Albert Schulz, took notice of his intellect and arranged for his entrance to the University of Königsberg in 1740. This was the same year in which Frederick the Great became King of Prussia (one of the later benefactors of Rousseau). One of Frederick's first acts was to appoint Christian Wolff to the University of Königsberg. Wolff had been exiled seventeen years earlier by Frederick's father for his elevation of reason over religious inspiration and moral exhortation. The battle between Pietism (which was prevalent in German society) and Wolffianism played out significantly in Kant's life.

As a young man, Kant took an interest in science. At the university he was instructed in Leibnizian metaphysics, but he believed that reason could not explain the problems of metaphysics. His early philosophical project was the creation of a scientific compromise between the views of Newton and Leibniz. In 1744, at the age of twenty, Kant left the university to earn a living as a private tutor. He earned his Master and Doctor of Philosophy in 1755 and took an unpaid teaching position at the university. His income was generated through fees paid to him by students for attending his lectures. Since his livelihood depended on lecturing on topics that interested his students, Kant found himself lecturing on a wide variety of topics, including logic, metaphysics, ethics, natural theology, the natural sciences, physics, chemistry, physical geography, and practical subjects, such as military fortification and pyrotechnics.

In 1755 Kant published his *Universal Natural History and Theory of the Heavens*, in which he proposed a nebular hypothesis on the origin of the solar system. Kant maintained a lifelong interest in science, and in addition to philosophy, he made contributions to cosmology and astronomy. He predicted the existence of the planet Uranus several years before it was seen by the English astronomer William Herschel (Oldroyd, 1986).

In 1755 Kant also published his *New Elucidation of the First Principles of Metaphysical Cognition*. In this publication he expounded on his thoughts about causality, mind-body interaction, and the traditional metaphysical proofs for God's existence, critiquing in the process the views of Christian Wolff. In 1762 Kant was introduced to the newly published writings of Jean Jacques Rousseau: *Emile*, and *The Social Contract*. Pietism had already introduced Kant to belief in the equality of all human beings in the sight of God. His convictions took on a rationalistic form in light of Rousseau's vision of humans as beings made free and equal by nature and who then find themselves in a social world of inequality and injustice.

Kant spent the next twenty years refining his own ethical position through the emphasis of reason. His route to accomplishing this feat was his devotion to reforming the foundations of the sciences and searching for the proper relation between empirical science and the claims of *a priori* or metaphysical knowledge.

In 1770 Kant accepted a position as a professor of logic at Konigsberg University. During the 1770s Kant began lecturing on the topic of anthropology, emphasizing practical experience and the historicity of human beings. He was skeptical of the ability of humans to ever gain anything like a scientific knowledge of their own nature and

looked forward to a revolution in the scientific study of human nature. He lectured on the topic of anthropology for the next twenty-five years. His lectures were well attended and served as a means to refine his thoughts about human history.

Kant believed in a scientific approach to philosophy and believed he had discovered the foundations of human knowledge. In 1781 Kant published the *Critique of Pure Reason*. Kant promoted the hypothesis that humans know the nature of objects *a priori*, and those objects then conform to our intuition. This hypothesis, according to Kant, uses the scientific method whereby pure reason is verified via experimentation. He believed that a Newtonian approach, of beginning with evident knowledge and then working back from it to its principles, would validate philosophic pursuits. As a result, Kant proposed that philosophy be limited to what does not transcend the limits of possible experience. Kant believed that limiting philosophy freed man to believe in things beyond his experience (such as God, freedom, and immortality). He believed that the failure of philosophy to prove metaphysical concepts led to radical and destructive philosophic views and that by denying philosophy access to certain topics he opened the way for man to possess faith in things transcendental in nature. In *The Critique of Pure Reason* he claimed that human feelings about religion, morality, and beauty were real even though science and reason could not explain them (Farah & Karls, 1997; Kant, 1787/2001; Oldroyd, 1986; Scharfstein, 1998).

By the middle of the 1780s Kant developed the foundation for much of the nineteenth-century philosophy of history. In a series of essays on the philosophy of history, Kant articulated his view that the final goal of human history is the creation of the perfect political constitution. In Kant's descriptions, humans are unaware of the

collective finality toward which they are moving. His theories formed the basis for future philosophers, including Hegel's conception of history, as the working out of the purpose of reason and the historical materialism of Marx.

Another important essay demonstrating Kant's historical concept is his response to German resistance to enlightenment. In his *Answer to the Question: What is Enlightenment?* (1784) he defined Enlightenment as "man's exit from his self-incurred minority...the incapacity to use one's intelligence without the guidance of another" (Kant, 1784/2001, p.135). He encouraged men and women to think for themselves, to free themselves from the guardianship they so readily granted to others. He proclaimed "*Saper Aude!* Have the courage to use your own intelligence!" (Kant, p.135) as the motto of the enlightenment. According to Kant, cowardice and the laziness of humans to think for themselves allows others to usurp the role of guardian. Humans choose a 'self-incurred minority' and reject their growth to maturity. He stated that "The guardians who have kindly undertaken the supervision will see to it that by far the largest part of mankind, including the entire 'fair sex,' should consider the step into maturity, not only as difficult but as very dangerous" (Kant, 1784/2001, p.135).

To be enlightened, therefore, is to possess the courage and energy to be self-directed in one's thinking. He pointed out that the people of his time were accustomed to having their thinking directed by others (including governments, the authority of ancient texts, and religious authorities). The courage to break from the guardians is a difficult task for individuals. He emphasized that enlightenment is a social and historical process, claiming that it is possible for a public to enlighten itself through the public use of reason. Kant introduced the concept that humans, as free agents, have the ability to govern their

own lives according to self-determined rational principles. In so doing, he brought to a culmination the spirit of the Enlightenment, with its radical questioning of every human activity in light of Reason. Kant's philosophy gave rise to a perplexing array of thinkers and movements who either claimed to adopt and perfect his views or claimed to expose and correct the errors in his philosophy.

In 1786 a series of articles by Jena philosopher Karl Leonard Reinhold thrust Kant into the limelight. Reinhold presented a favorable discussion of the theories Kant presented in his *Critique of Pure Reason*. Kant, who had never traveled more than thirty miles from his hometown of Königsberg, was now the focus of philosophical discussions throughout Germany. Philosophers debated as to whether one should adopt the Kantian position, and if so, what version or interpretation should one adopt. There also arose a group of 'post-Kantian' philosophers who criticized the alleged inconsistencies that occurred in Kant's writing and who desired to master and transcend Kantian philosophy.

In response to the attention and the debates, Kant decided to produce a second edition of the *Critique* (1787), in which he attempted to clarify his position. In the preface to the second edition he stated that

Whether the treatment of that class of knowledge with which reason is occupied, follows the secure method of a science or not, can easily be determined by the result. If, after repeated preparations, it comes to a standstill, as soon as its real goal is approached, or is obliged, in order to reach it, to retrace its steps again and again, and strike into fresh paths...we may be convinced that such a study is far from having attained to the secure method of a science, but is groping only in the dark...

That *Logic*, from the earliest times, has followed that secure method, may be seen from the fact that since *Aristotle* it has not had to retrace a single step...It is remarkable also, that to the present day, it has not been able to make one step in advance, so that, to all appearance, it may be considered as completed and perfect (Kant, 1787/2001, pp. 7-8).

Kant claimed that *a priori* knowledge is required for Reason to be present as an element in any scientific field, and that Reason is demonstrated in either theoretical or practical knowledge. He used mathematics and physics as examples of two theoretical sciences of Reason that have to determine their objects *a priori*. With *a priori* objects scientists are equipped to employ empirical methods to discover the laws of nature.

When Galilei let balls of a particular weight, which he had determined himself, roll down an inclined plain, or Torricelli made the air carry a weight, which he had previously determined to be equal to that of a definite volume of water; or when, in later times, Stahl changed metal into lime, and lime again into metals, by withdrawing and restoring something, a new light flashed on all students of nature. They comprehended that reason has insight into that only, which she herself produces on her own plan, and that she must move forward with the principles of her judgements, according to fixed law, and compel nature to answer her questions, but not let herself be led by nature...because otherwise, accidental observations, made on no previously fixed plan, will never converge towards a necessary law, which is the only thing that reason seeks and requires. Reason, holding in one hand its principles...and in the other hand the experiment...must approach nature, in order to be taught by it...even the science of physics entirely owes the beneficial revolution in its character to the happy thought, that we ought to seek in nature (and not import into it by means of fiction) whatever reason must learn from nature, and could not know by itself, and that we must do this in accordance with what reason itself has originally placed into nature. Thus only has the study of nature entered on the secure method of a science, after having for many centuries done nothing but grope in the dark (Kant, pp. 10-11).

In the introduction of *Critique*, Kant also separated metaphysics as a “completely isolated and speculative science of reason, which declines all teaching of experience, and rests on concepts only” (p.11), claiming that metaphysics had not developed a secure method of science. Unlike Hume, who focused on the object being perceived in the human mind, Kant recommended a shift in interest from the object being observed to the observer.

Hitherto it has been supposed that all our knowledge must conform to the objects: but, under that supposition, all attempts to establish anything

about them a priori, by means of concepts, and thus to enlarge our knowledge, have come to nothing. The experiment therefore ought to be made, whether we should not succeed better with the problems of metaphysic, by assuming that the objects must conform to our mode of cognition, for this would better agree with the demanded possibility of an a priori knowledge of them (Kant, p. 12).

Kant believed that philosophy required a revolution in thinking similar to the revolution that occurred when Copernicus placed the sun, rather than the earth, at the center of the heavenly system.

Copernicus, who, not being able to get on in the explanation of the movements of the heavenly bodies, as long as he assumed that all the stars turned round the spectator, tried, whether he could not succeed better, by assuming the spectator to be turning round, and the stars to be at rest. A similar experiment may be tried in metaphysic, so far as the intuition of objects is concerned (Kant, p. 12)

Much of Kant's time was dedicated in the defense of his system. His opponents were numerous, including empiricists, skeptics, defenders of the Leibniz-Wolffian position, religious traditionalists, and popular Enlightenment rationalists.

Kant also came into conflict with government authorities over his views on religion. Until 1786, Frederick the Great, despite being a military absolutist, was in favor of religious tolerance and theological liberalism. Upon his death in 1786 his nephew Friedrich Wilhelm III inherited the throne. Friedrich III took religion very seriously and immediately set out to correct the religious beliefs of his countrymen. He removed Baron von Zedlitz from the position of Minister of Education, and replaced him with J.C. Wollner. Both the King and his new minister considered any attack on the Lutheran State Church to be a threat to the foundations of civil peace. To them, Kant's attack on the objective proofs of God's existence accompanied with his belief that faith required a denial of knowledge, seemed dangerously subversive. His principles of enlightenment –

that all individuals have a right and a duty to think for themselves and that the state should encourage such free thought by protecting the public realm of discourse from interference by the state – seemed like the basic elements of civil anarchy.

Wollner issued religious edicts aimed at reversing the effects of Enlightenment thinking on the church and the universities. The writings and teaching of clergy and academics were reviewed to assess their adherence to religious orthodoxy. Pastors and educators were required to recant any written statements in opposition to the religious dogma or lose their positions. Writings on religious topics had to be submitted to, and reviewed by, a board of censorship before they could be taught or published.

In 1791 Kant was informed that a decision had been made to forbid him to write anything further on religious subjects. Kant had planned on writing a book on religion. He was not a political radical. His political thought was strongly influenced by Hobbes and he believed that the state needed to protect individuals and society from the errant tendencies of humans to violate one another. He supported the concept of the state regulating the activities of individuals in order to prevent civil disorder. Although he disagreed with the new direction taken by the state, he had already decided to comply with any direct orders he might receive to cease writing or teaching on religious subjects.

He did not, however, act on anticipation of such orders and determined to use any legal devices at his disposal to continue with his work. In 1792 he submitted his essay on radical evil (which was later incorporated into his essay *Religion Within the Limits of Reason Alone*) to the *Berlin Monthly* for publication. After being reviewed by the censorship board, his essay was rejected. He immediately submitted the entire essay of *Religion* to the academic faculty of philosophy in Jena, which legally served as an

alternative to the official state censorship; his essay was published in 1793, with a second expanded edition published in 1794. In 1793 Kant published his *Critique of Judgment*. The two main themes of this work – aesthetic experience and natural teleology – were both topics of Enlightenment thinkers. In his third *Critique*, Kant clarified his own thoughts about the status of teleological thinking in relation to natural science and his philosophy of history. Kant, who was now in his late sixties, demonstrated a willingness to examine, critique, and revise his own system of thinking. His main motivation for writing the *Critique of Judgment* was to address the gap he saw between the theoretical use of Reason in the natural world and its practical use in morality and faith in God.

Kant's publications finally angered the authorities into taking action. Wollner notified Kant that he was no longer permitted to teach or write on the subject of religion unless he conformed his opinions to the tenets of orthodox Christianity. Kant replied, defending his position, but promised to comply with the command.

Kant turned his attention to other interests, writing on subjects that were also unpopular with the government. He retired from university lecturing in 1796. In 1797 King Friedrich Wilhelm III died. Kant considered himself freed from the promise he made to follow Friedrich's royal command and in 1798 he published a tract on religion titled *Conflict of the Faculties*. He continued to develop his philosophical system and write up until his death in 1804, just a few months short of his eightieth birthday. At the time of his death he was working on an essay that focused on the transition between transcendental philosophy and empirical science. His interest was in response to recent scientific developments and the work of young philosophers who were inspired by his own philosophy.

ACT TWO

Scene 7

JUSTIN: I studied about a lot of this in history class, but never really thought about why the periods of history were different philosophically.

BILL: There was definitely a shift in the thinking of even common people. The world during the Renaissance period was still a world dominated by a strong Church, belief in magic, superstitions, miracles, and witchcraft. It was as if magic competed and interacted with religion and science. Because people believed in magic even the intellectuals blended it into their perspective of science and religion. But the Renaissance did provide a bridge into the intellectual pursuits of the Enlightenment period. Without a change in perspective that permitted the examination of man's relationship to God, we would not have been able to have the open exchange of ideas that brought about the Enlightenment. On the other hand, we probably wouldn't have had the change in perspective and exchange of ideas without the printing press.

MINERVA: I have always been interested in how scholars used the classical texts as a basis for testing the authority of the Church. The authority of the medieval Church fell into disrepute, making way for the power of both the intellectual and Reason. Religious fervor produced years of war and bloodshed. Reason was elevated as the means to resolve human conflict. We went from believing that the Church was the sole authority in telling us how to live to believing that particular intellectuals could provide direction on how to conduct human affairs.

ADAM: Well, I for one don't want *anyone* telling me how to live.

MINERVA: That, my friend, is an extension of the Age of Reason.

ADAM: Really?

MINERVA: Yes, the Enlightenment, also referred to as the Age of Reason, left us with a new heritage. One in which the guardians of old cultures, the priests, scribes, and soothsayers, were all replaced by the new humanists; men and women who claimed to break through the limits of external authority. For the first time in history, men and women claimed the ability to diagnose the ills of society and cure them through the power of their own intellect, without the confines of traditional religions.

BILL: (*getting a little excited*) Yes, but look at Rousseau. He was a paranoid mad-man and yet his writings influenced the structure of our educational system. Acceptance of his ideas is based on his own claims of being the most virtuous man of his time. His life proves he wasn't, and we still read his works – many of them are still in print today. The greatest intellectuals of his time rejected him. But we like the sound of what he writes – it supposedly 'makes sense'. So what do we do? We perpetuate a lie because it fits with human Reason.

MARY ANN: So are you saying that human Reason gives us worse results than religion? Heck, there's sure been a lot of blood shed in the name of religion.

BILL: No, Mary Ann, I'm not. I think it takes a measure of both. And as often as not wars are fought over things other than religion. It's just that we seem to be willing to follow anyone who sounds like he knows what he's talking about. It makes me long for some good old American individualism. Think for yourself. Be independent enough not to blindly accept someone else as an authority. And that

doesn't mean that we have to abandon faith in God. It was the combination of individuality and faith that created this country.

ADAM: Yeah, I've heard all that before. But if that's the case why'd we so eagerly accept slavery?

BILL: I didn't claim that being an independent thinker and having faith would make us perfect. I just think it leads to a better society.

ABBY: But Adam makes a good point. Minorities, including women, or anybody who didn't fit the right mold, didn't really have any rights for a long time in the U.S.

TONI: Even though the intellectuals were busy making up new rules, the regular, everyday folks were just trying to make a living. Tell us, Minerva, how did all this play out in everyday life in America and Europe?

MINERVA: Let's take this a step at a time – let me bring you up to date on the happenings in America...

Introduction of a New World – Eighteenth Century America

Religious freedom developed slowly in America. Many of the individuals and groups of settlers traveled to America to be free from religious persecution in Europe. This did not mean, however, that they were themselves tolerant of other religions. Except in Maryland, the colonies established for religious reasons were exclusive to people of common religious convictions. The idea of religious toleration was a very radical idea in the seventeenth century. In Virginia and Massachusetts the government closely controlled church affairs. In Virginia, the Church of England (which later became the Episcopal Church) was established. In Massachusetts, the Congregational Church held a privileged

position. In both states, residents were required to attend services and the clergy were public officials paid by the government. In Massachusetts, Roger Williams and Anne Hutchinson, who founded Rhode Island, were banned for refusing to recognize the authority of the Congregational Church.

By the end of the seventeenth century, other Protestant religions were being tolerated in Massachusetts. Religious tolerance spread through the colonies. In 1649 Maryland passed an Act of Toleration that granted religious freedom to all Christians.

During the seventeenth century, several colonial legislatures passed laws regulating morals. In Virginia, church wardens were required to report for trial any individuals who led profane and ungodly lives, including common swearers and drunkards. In Puritan Massachusetts, the legislature dictated rules for conduct and the types of clothing permissible for women to wear.

In 1700 the colonist population in America numbered 200,000. By mid-century there were one and a half million people in the thirteen colonies, with over two-thirds of them native-born. Since most of the original colonists were either British, or of British descent they shared a common language and political background. Political activists who fled Great Britain relocated to the colonies bringing their radical political ideas with them. Ideas about republicanism, universal suffrage, liberty, and equality had died out in Great Britain, but thrived in the colonies. There was no aristocracy. The ready availability of land and the hardships of life tended to blur class divisions, although a distinction in classes began to emerge by the mid-eighteenth century. Each colony had a representative assembly and the colonists were used to governing themselves. Gradually, with the increase in religious tolerance, religious restrictions were eased. By the beginning of the

eighteenth century, most of the laws regarding immoral conduct had been repealed or forgotten.

Many of the eighteenth century religious leaders feared that Americans were faltering in matters of religion. In the 1730s and 1740s there was a revival in religion referred to as the 'Great Awakening'. Preachers from several churches led the movement. They emphasized original sin, the punishment of sinners by God, Christ's atonement for sin, and His provision of a way of salvation. The revival meetings aroused excitement throughout the colonies. Many churches quarreled and split over disagreement as to whether the leaders of the Great Awakening were teaching true doctrine.

Calvinist morality made an important impact on American behavior and ideals. Many American religions accepted Calvin's strict moral code. According to Calvin, the great virtues were industry, thrift, honesty, and temperance. Taken together, these virtues comprise what came to be known as middle class morality (Harlow & Noyes, 1961; Smelser, Kirwin, Hoffman, & Fabian, 1962).

Education was an important feature of American life. Harvard College was founded in 1636. In 1647 Massachusetts authorized the first public school system. The Puritans believed that everyone should be able to read the Bible. According to the laws every town of fifty families was required to appoint a teacher of reading and writing. In towns of one hundred families there were grammar schools capable of preparing boys for college. Grammar schools taught Latin, Greek, and arithmetic.

The first school in New York was established in 1638. By 1664 most of the Dutch colonies had schools. In Pennsylvania, public education was provided in 1683, but parents, rather than the government, paid the teachers. The colleges of William and Mary

(1693) and Yale (1701) were founded. Five more colleges were founded between 1746 and 1769. Most of the colleges were founded to prepare young men for the ministry; the curriculum included study of the Greek and Latin classics, mathematics, logic, some science, and moral philosophy.

By the beginning of the eighteenth century, many of the colonies began to circulate newspapers. By the middle of the century, every colony except Delaware and New Jersey had weekly newspapers. The newspapers kept American colonists well informed. A large portion of the population was literate and had an active interest in politics and government (Farah & Karls, 1997; Harlow & Noyes, 1961).

The first newspaper, the *Boston News Letter*, was produced in 1704. New England became the source of the vast majority of all colonial publications. By the mid-1770s there were thirty-seven newspapers being printed in cities along the eastern coast. Many of the publications, including newspapers, reported advances in the study of science. The study of science, particularly plants and animals, held wide interest for eighteenth century colonists. From the early days of discovery, the new flora and fauna in the New World also fascinated Europeans.

Colonists, and subsequently European farmers, adopted Native American farming techniques. In 1662 John Winthrop presented a paper to the Royal Society on maize, or Indian corn. He described the plant, its uses, and cultivation. He also explained the use of fish and cow dung fertilizers by English settlers as well as the use of multiple crops on a single plot of land. The interest in botany became international. Europeans traveled to the New World to explore and document the variety of new plants and animals. Colonists also became interested in the task of collecting and classifying

American plants, producing an international community that corresponded and exchanged writings, drawings, and specimens. Most participants were amateurs and were able to correspond with experts in the field. Talented men of no particular social distinction were embraced by this community; many tradesmen and other ‘common men’ flocked to scientific lectures, which were popular in eighteenth century Europe and America (Maier, Smith, Keyssar & Kevles, 2003).

It was in this environment that Benjamin Franklin (1706-1790) a statesman, scientist, and philosopher came to develop and cultivate a uniquely American philosophy. Born in Boston, Franklin was the tenth and youngest son of Josiah Franklin, a candlemaker. After only a few years of formal education Franklin’s father put him to work making candles and later apprenticed him to his brother James, a printer. Franklin began reading at an early age. He read Bunyan, Defoe, Cotton Mather, Shaftesbury, Locke, Addison, and Steele. He trained himself in writing.

Self-educated, Franklin fashioned himself after Socrates. At age sixteen he studied an English translation of Xenophon’s *Memorabilia*, in which Xenophon relates how brilliantly Socrates used questions as a means to win intellectual debates. Feigning ignorance, the young Franklin used questions to ensnare his opponents and to obtain concessions that would have otherwise been unrealized in a head-on debate. He used the Socratic method to good-ends, viewing the ends as a justification for the means – in this manner Franklin displayed his pragmatic philosophy – *show results*. Franklin also adopted the Socratic view that virtue can be taught, and in so doing that men could be transformed into more virtuous beings. The belief that human nature can be changed

through education has always been a cornerstone of American public education and American philosophy.

Franklin adapted the Socratic virtue of 'know thyself' to 'make something of yourself'. As a pragmatic, Franklin believed that virtue absent of results was useless, he did not condone slavery, and believed that sloth (intellectual or physical) was a sin. Franklin's philosophy was evident throughout his life; he was vitally interested in every aspect of human endeavor. He was interested and self-educated in science, history, art, logic, and practical life. Philosophy and science were one and the same. He was able to converse on any subject on earth. He wrote his philosophy in revealing and readable form, including his full views on religion. He provided the original impetus to pragmatic American philosophy, incorporating Newtonian science and the empiricism of John Locke and blended it with an essence of American independence, optimism, and resolve.

While Franklin was apprenticed to his brother James as a printer, and unbeknownst to his brother, he submitted a series of satirical articles over the signature of an imaginary widow 'Silence Dogood'. His brother printed the 'Dogood Papers' in his newspaper, the *New England Courant*. James Franklin had completed his apprenticeship in England and returned to America with radical ideas. His newspaper served as a medium for the dissemination of views opposing the government. When James was arrested and imprisoned for a time, Benjamin continued the work of printing and distributing the *Courant*. James refused to abandon his radical ideas and was forbidden to publish his paper. Benjamin became the publisher and used his newfound power to demand his freedom. James blocked Benjamin's ability to gain employment with another Boston printer. Benjamin's struggles with James, and the fact that people were starting to

call him an atheist, prompted him to leave Boston and relocate, settling in Philadelphia in 1723.

In Philadelphia he found a job as a journeyman printer. He impressed his employer and was introduced to the Governor of Pennsylvania who promised him support and capital to travel to London to purchase printing equipment. Unfortunately, the Governor's financial aid never arrived and Franklin found it necessary to take employment at Palmers, a publishing house in London.

While working at Palmers, Franklin worked on printing the second edition of Wallaston's *Religion of Nature*. He claims he found some of the reasoning of the treatise to be faulty and took it upon himself to write his own metaphysical piece, *A Dissertation on Liberty and Necessity, Pleasure and Pain* (1725), which resulted in him meeting many of the intellectual elite of Boston. Franklin returned to Philadelphia in 1726.

The greatest domestic difference between the colonies was religion. Living in the middle of the turmoil, Franklin proclaimed himself a Deist. At the age of fifteen, he read books that argued against Deism, but found the argument for Deism to be stronger than the refutation

I had been religiously educated as a Presbyterian; and tho' some of the dogmas of the persuasion, such as the eternal decrees of God, election, reprobation, etc., appeared to me unintelligible, others doubtful, and I early absented myself from the public assemblies of the sect, Sunday being my studying-day, I never was without some religious principles. I never doubted, for instance, the existence of the Deity, that he made the world and governed it by his providence, that the most acceptable service of God was the doing good to man, that our souls are immortal, and that all crime will be punished and virtue rewarded either here or hereafter. These I esteemed the essentials of every religion (Franklin, 1949/2001, p.92).

In 1728 Franklin wrote his *Articles of Belief and Acts of Religion*, in which he described religion as a reflection of Newton's cosmology with a slightly polytheistic theme.

I conceive then, that the Infinite has created many Beings or Gods, vastly superior to man, who can better conceive his perfection than we, and return him a more rational and glorious praise...[with]one supreme most perfect being, author and father of the gods themselves...each of these is exceeding wise, and good, and very powerful; and that each has made for himself, one glorious sun, attended with a beautiful and admirable system, that I propose for the object of my praise and adoration (Franklin, as cited in Van Wesep, 1960, pp. 36-37).

Franklin believed that religion served a purpose, but felt that the religious congregations of his day offered too many prayers and sermons without producing any good works. He doubted the divinity of Christ, but felt that Christ's doctrines served to promote a virtuous life.

In 1727 Franklin created the Junto, a scientific society. Membership was small and required participants to have a strong interest in scientific knowledge without prejudice, to possess a genuine concern for fellow men regardless of their religion or profession, to harm no one with speculative opinions, to love truth, and a commitment to search for and communicate truth to others. In 1743 he founded the American Philosophical Society, which had a wider international membership, in hopes of creating a worldwide cooperative scientific research community.

Franklin's success between his return to Philadelphia in 1726 and his retirement in 1748 is remarkable. By 1730 he owned his own newspaper and a printing business. In 1731 he helped to found the first American subscription library; he became a Mason in the same year. In 1732 he started the publication of *Poor Richard's Almanac* which he published for the next twenty-five years, the success of which added to his growing wealth. In 1734 he became Grand Master of the Masonic lodge. In 1736 he served as

clerk to the Pennsylvania legislature and established the first fire company. In 1737 he was appointed postmaster of Philadelphia. In 1748, at the age of forty-two, Franklin retired from business and devoted his attention from then on to science and politics.

Franklin is credited with creating a theory of electricity. In 1751 he published *Experiments and Observations on Electricity*, which was the culmination of years of experiments conducted with several of his friends. In this book Franklin theorized that lightning is a large-scale electrical discharge and he proposed an experiment by which to prove his theory. He later took the task upon himself (his famous kite and key experiment) that led to the development of the lightning rod.

In 1755 Franklin and some of his associates organized the college now known as the University of Pennsylvania. The curriculum offered a wider variety of studies than was then offered in any American college. Students could study the customary courses that emphasized Greek, Latin, and other traditional topics; but they could also study mathematics, surveying, navigation, physics, chemistry, agriculture, history, government, economics, and international law.

In 1757 the colonial legislature sent Franklin to London to represent them in a dispute with the governor. He returned to America in 1762 only to return to London two years later to petition the King to end the proprietary government of the colony. He was subsequently appointed colonial agent for Georgia (1768), New Jersey (1769), and Massachusetts (1770), holding each position concurrently. He returned to America in 1775 and was selected as a delegate to the second Continental Congress, which in turn elected him a member of the committee to draft the *Declaration of Independence*. Once the American Revolution began, he was dispatched to France to seek the help of Louis

XVI, where he remained as Minister; following the war he traveled to England to make peace with England.

Franklin discovered and promoted men of like philosophy and leveraged their talents to help frame American philosophy among the common man. While in London, Franklin met Thomas Paine (1737-1809) and promptly sent him to America with letters of introduction. Franklin supported and did much to establish the production and dissemination of literature to the American colonists, including the creation of a postal system. He was outspoken on the advantages of capital and advocated the development of wealth as a means to break the bonds of the feudal system (Franklin, 1949/2001; Van Wesep, 1960).

With Franklin's letters of introduction, Thomas Paine relocated to Philadelphia in 1774. Paine was born in Thetford, Norfolk in 1737 into a Quaker family. In England, Paine was not able to hold any job for long. In America, he became an instant success. Franklin's son-in-law, Richard Bache, found work for Paine at the *Philadelphia Magazine*. During his first year in Philadelphia Paine published "African Slavery in America", an article denouncing the practice of slavery. He was soon consulted on all matter of subjects: new inventions, the practice of dueling, cruelty to animals, and women's rights. His vivid, forthright, and factual writing on these topics soon tripled the circulation of the magazine.

In *Common Sense* (1776) Paine advocated independence on the simple and irrefutable grounds that it was an inevitable outcome. Half a million copies were sold; the pamphlet helped to convince thousands of American colonists that it was time to part with Great Britain (Farah & Karls, 1997; Seymour-Smith, 1998).

Franklin, who was now back in America, joined the First Continental Congress and Thomas Jefferson in the creation of the *Declaration of Independence*. Focusing on John Locke's concept of the social contract, the *Declaration* created a contract between the ruler and those being ruled. Individuals are imbued with certain basic rights that the government cannot take away. If a ruler violates the rights of the people, thereby losing their support, the people have the right to change the government through rebellion. The beginning of the *Declaration* reads:

When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another and to assume among the Powers of the earth, the separate and equal station to which the Laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation (The Declaration of Independence, 1776/2001, p. 334).

The *Declaration* provided a long list of "injuries and usurpations" by the present King of Great Britain. On July 4, 1776 the Congress adopted the *Declaration of Independence*, making war a certainty.

The War of Independence came to a conclusion in August of 1781 with the British surrender at Yorktown. The colonists won their independence with the support of France and Spain. In 1783 Great Britain recognized its former American colonies as an independent nation, the United States of America. Between 1781 and 1788 the United States operated as a confederation of states. In 1788 the states ratified the United States Constitution, which went into effect the following year. The new constitution set up a federal system in which governmental power was divided between central government and state governments. Adopting the recommendations of Motesquieu's *The Spirit of*

Law (1748), central political power was divided among executive, legislative, and judicial branches of government, as well as a system of checks and balances.

Under the new constitution, the United States was a republic with an elected President instead of a monarch. Elections in 1789 made George Washington the first President. Under the new President, Congress developed a Bill of Rights (1791) designed to protect individual rights, including freedom of religion, personal liberties, freedom of speech, trial by jury, and the rights of the individual states (Farah & Karls, 1997).

ACT TWO

Scene 8

MINERVA: So you see, the American system of government is a direct result of the predominant philosophy of the time period in England, Europe, and America. The founding fathers had contact with the thinking of both French and English intellectuals. They combined the insights on human rights and English political philosophy with the French emphasis on Reason, mixed in a little American independence and produced a unique form of government.

LINDA: But if we were so fair-minded, how did we get so entrenched in slavery?

MINERVA: Unfortunately, some things develop over time and sear our collective conscience. Kind of like the old analogy of boiling a frog...throw it in hot water and it jumps out, but put it in a pot of cold water and slowly heat it and it doesn't move, it just sits there and becomes a stew.

ADAM: But enslavement of another human being is a lot different than killing a frog.

MINERVA: I guess that depends on one's philosophical perspective.

ADAM: No, wrong is wrong.

TONI: Adam, I agree that slavery is wrong, but I don't think people thought it was back then. I think they even justified it as the 'right' thing to do.

MINERVA: It is important to understand the culture and philosophy present at any time in history if we are going to assess it. We judge it from our own current perspective. We forget that what we legalize, we moralize. Our government started out as a system that regulated moral conduct. If it was legal it was moral. If an action was deemed immoral it was made illegal. Therefore, if slavery was legal it was moral. Humans have a hard time resisting the power of authority. If the powers that be call it appropriate, we tend to accept the action and the outcome.

IRENE: That is a tough thought to accept.

DAVID: Unfortunately, I think you're right, Minerva. It takes a lot of backbone to buck the status quo once you determine it's wrong. Look how long it has taken to overcome the damage of discrimination and we still have a long way to go. How did we get so bad off?

MINERVA: You have to understand what was going on in America. The institution of slavery hurt the country, but it also retarded the development of an industrial society in the southern states. The southerners saw the combination of cotton and slave labor as a means to wealth, and ignored the possibility of industries that hired labor in the north. The rejection of slavery in the north was both for philosophic and economic reasons.

Life in Eighteenth Century America

Most of the goods American colonists purchased were produced in Europe. Some goods were supplied by colonial craftsmen, but typically of lower quality than their European counterparts. During the early part of the eighteenth century, several industries developed in the American colonies, including sugar, steel, rum, and candle production. The colonies' primary products were agricultural, and most were produced by traditional methods. Roughly 95% of the American colonists lived in a rural setting. However, by 1770 the cities of Philadelphia and New York boasted populations of roughly 22,000 each. Other cities, including many of the ports, had populations that averaged approximately 10,000 each (Maier, Smith, Keyssar & Kevles, 2003).

The agricultural industry in the colonies was heavily dependent on the use of indentured labor. The institution of slavery grew slowly in the colonies, eventually developing into an industry. Although the Spanish had engaged in slave trade since the fifteenth century, English law did not recognize the institution of slavery. It did, however, recognize other forms of bondage. Men and women indentured themselves as apprentices to learn a craft or to work as servants for a period of time in exchange for passage to America. The first slaves who arrived in the mainland British colonies in the early seventeenth century were treated much like other bonded persons. Most of the early slaves did not arrive directly from Africa. Referred to as 'Atlantic Creoles' the slaves were part of a multilingual society that developed on the coast of Africa, in Europe, and in the West Indies. In these societies, Africans, Europeans, and a few native Americans met, interbred, learned each other's languages and religions, and acquired new skills. Once in North America, slaves often worked alongside their owners and other indentured

servants. They were usually expected to support themselves and held the right to any excess food or livestock they produced, as well as the profits from its sale. Using their profit, slaves could purchase their freedom. Some ex-slaves even acquired servants and slaves of their own.

Freed slaves founded communities, most notably on the eastern shore of Virginia and Maryland. Like other colonists, the freedmen owned land, registered land titles and debts and had their wills notarized in the county courthouse. In the early seventeenth century, personal freedom, property holding, and family conferred status, and blacks shared in those rights. Members of leading black families sometimes took white spouses, without imposing any social stigma on the white partner.

The condition of their lives changed dramatically in the late seventeenth and early eighteenth centuries. With the decline of English indentured servants, slaves were transported to North America by the shipload – and they increasingly came straight from Africa. Colonial legislators created statutes that defined the American institution of black chattel slavery. According to those laws, slavery was considered servitude for life; it was a condition confined to blacks (and sometimes Indians); and the children of slave mothers were also slaves. In 1691 the Virginia General Assembly adopted a new law that outlawed interracial marriages. Over the next fifty years, laws were passed in Chesapeake that prohibited free blacks from employing white servants, voting, holding office, serving on juries, or bearing arms. Blacks were also prohibited from entering certain crafts or engaging in trade. Similar versions of these laws spread throughout the colonies. As Virginia and Maryland planters bought more and more slaves, the Chesapeake changed

from a society with slaves to a slave society where slaves were a basic component of the social and economic fabric.

The new slaves were from a variety of African nations, each with an independent language, religion, and leadership. They rarely spoke a European language, or any language that allowed communication, and they had no acquaintance with European religions, work routines, or culture. To govern the slaves, their owners resorted to force; provincial laws permitted owners greater latitude in disciplining slaves than they had with white servants. Slavery became more brutal. Slaves arrived in a weakened condition, most having experienced a forced march from their inland homes, confinement in dungeons or open pens, and then two months time below deck in a cramped slave ship with little food or sanitation. On average ten to twenty percent of the slaves died en route to America and many more died after being exposed to European and American childhood diseases of measles and whooping cough. Those slaves who survived produced a culture unlike that of the Atlantic Creole slaves. They carried forward elements of their various tribes that blended into a unique African identity.

As the color of skin became the differentiator used to define social status, the whites began to pull away from the freed blacks. Being white became a new definition of freedom. New class divisions emerged. Rich planters and poor freemen joined together and shared a pride in the freedom they enjoyed.

The northern colonies never became slave societies like their southern neighbors. But they did experience an increase in the slave population and they too adopted new laws that defined the institution and established rules and procedures especially for slaves. In Boston, Newport, New York, and Philadelphia, slaves were a common feature

of wealthy households and even in the homes of middle-class people, such as the Franklins. Slave imports in the north increased when conditions such as war kept white workers in Europe. When the influx of white immigrants in the north increased, slave imports dropped.

The lack of opposition to slavery seems as remarkable as its rapid spread. In 1700 Samuel Sewall, who served as a judge in Salem's witch trials, wrote a tract entitled 'The Selling of Joseph' that attacked slavery on religious grounds. Some Quakers also opposed slavery, but these few voices stand out as the exception rather than the rule. Slavery was justified by white colonists as an alternative to the failings of indentured servitude and they saw one as no more immoral than the other (Maier, Smith, Keyssar & Kevles, 2003).

The feeling against slavery virtually disappeared in the south with the invention of the cotton gin in 1793 by Eli Whitney. Prior to the cotton gin, one person could clean one pound of cotton per day. The cotton gin enabled one person to clean a hundred or more pounds of cotton in one day. The machine gave impetus to the expansion of cotton production. Cotton quickly became the chief staple of the South, with exports rising from 189,500 pounds in 1791 to 21 million pounds in 1801 (Thomas, 1908).

MINERVA: The type of work available in the north appealed to whites, who then objected to the presence of slave labor. But the hot, humid weather and strenuous work in the cotton fields held no appeal for white laborers. Conditions of employment and economics drove the growth of slave labor as much as anything else.

ADAM: What was so different about the north – it started out as agricultural.

MINERVA: Well, weather for starters, and...

Meanwhile, the cities in the north continued to grow as major industrial and trade centers. Colonial cities retained a small town feel and were nothing like the urban centers of Europe. These small metropolises did, however, play a significant role in Colonial life. The busy port cities served as centers of information dissemination and meeting places. Merchants gathered in coffeehouses or taverns to talk and exchange information; artisans shops were located along the main streets selling everything from locally produced barrels or hats to articles of silver and gold. Booksellers and libraries began to appear in the early part of the century.

Apprenticeship was the predominant method by which individuals learned a trade. Parents of all classes who wanted their children to learn a trade bound them to apprenticeships for a period of four to seven years. Sons of southern plantation owners were often apprenticed to merchants. Young men in the larger cities would take evening courses at business academies.

Prior to the American Revolution, the focus in England was to keep the colonies in the position of producers of raw materials. Independence presented new business challenges and freed pent-up entrepreneurial energy. American social values emphasized independence, hard work, and the ability to improve one's financial position in life. Unfortunately, England reacted to her defeat by imposing trade restrictions that were disastrous for American businesses dependent on the trade industry. Not only the merchants, but also all the associated workmen, were left without employment. Farmers,

lumbermen, fishermen, and cattle raisers all suffered due to the decrease in American exports.

The economic depression led to the unification of the states and the ratification of the U.S. Constitution. The newly formed government went to work immediately to address the trade problem. To encourage American shipping, Congress passed a tariff bill that allowed a ten percent discount off the duties on all goods imported in American vessels and a tonnage duty on all ships entering American ports, with foreign ships paying a higher tax than American ships

Alexander Hamilton became the Secretary of the Treasury. Born in the West Indies, Hamilton moved to America in 1773 to enter college and stayed on to aid the revolution. Hamilton became an expert on the subject of public finance. He believed in the rule of the rich, believing they held a larger stake in the development and stability of a well-ordered society. He believed the government had a duty to promote the well being of the rich and to develop a close relationship with the affluent class. Hamilton urged Congress to fully pay the national debt incurred in fighting the War for Independence (which had been financed by wealthy businessmen), to pay all state debts related to the war, to set up a national bank to produce paper money and various financial services, and to raise the tariff in order to bring in revenue to the national treasury. Congress supported all of Hamilton's recommendations.

Congress passed a tariff law in 1789 that protected American manufacturers in competition with foreign manufacturers, encouraging Americans to purchase American made products. Dispute over Hamilton's tariff policy produced two parties: the Federalists (who agreed with Hamilton) and the Jeffersonian Democrats. Despite the

differences in opinions between the two parties, most people began to have confidence in the new government (Harlow & Noyes, 1961).

Economically, the new nation faced an interesting dilemma. After two hundred years of settlement the new world still offered a seemingly inexhaustible supply of unoccupied land. The lure of an independent life as a landowner held stronger appeal than the life of an industrial laborer. Agriculture was still the primary industry that offered the promise of greatest returns. Unoccupied western land was the chief cause of the scarcity and high cost of labor, a chief deterrent to the growth of manufacturing. In spite of the challenges, the closing years of the eighteenth century witnessed the birth of the factory system. The scarcity of labor encouraged the experimentation and development of labor saving machinery and techniques.

The existence of an abundance of raw material in America, war in Europe, the continual flow of European laborers willing to engage in industry, and government tariffs on imports, all contributed to the growth of the American factory system. Textile factories were established in 1787 in Philadelphia and Beverly, Massachusetts, spreading in later years into other locations in the Northeastern United States. In 1789 Samuel Slater built the first American factory to produce machine-made cotton warp.

The manufacture of woolen products developed alongside the improvements in cotton products. The wool of colonial sheep produced a coarse cloth. After 1790, improved European breeds were introduced that improved the product and made possible the manufacture of excellent woolens from domestic sheep. Simultaneously, the manufacture of woolen cloth moved from the household to the factory. In 1788 mills were founded in Hartford, Connecticut and Stockbridge, Massachusetts and expanded

into other cities in later years. The census of 1810 reported twenty-four factories and 1,682 fulling mills.

New England, with its poor soil for agriculture, but its abundance of waterpower and closely settled population centers, provided a natural location for factories. The Middle Atlantic States suffered from the continual siphoning off of its population to western lands. The southern states continued to serve as a source of wool and cotton that was sent north for processing.

The scarcity of skilled labor allowed workmen to command fair wages and maintain a decent standard of living. Although urban rents were relatively high, food was cheap and clothing reasonably priced. The life of the skilled laborer was bearable; the life of the unskilled laborer, who received lower wages, was difficult. However, both skilled and unskilled laborers earned higher wages in America than in Europe. Few lived in a state of extreme poverty since the workman could always escape his position by immigrating to the frontier. The introduction of the factory system in America was not accompanied with the horrors of the English system. The early workers in the New England textile mills were ordinarily girls and unmarried women, to whom the chance of earning money allowed them to escape the dependence on farm life, factory life was viewed as an opportunity rather than a misfortune. Living conditions were more favorable than in England. Owners typically oversaw the early mills, and workers were not viewed as lower class citizens.

The American factory system was in its infancy during the late eighteenth century, lagging behind the system in England by three decades. America waited on the introduction of new inventions from England, where regulations prohibited the export of

technology and the immigration of skilled labor. Although late in coming, the industrial revolution was soon to transform the American landscape (Faulkner, 1924).

ACT TWO

Scene 9

JAKE: I guess I'd forgotten that the US was behind Europe in bringing in new technology. I always think of us as the innovators.

JUSTIN: Me too. I thought we were the inventors and everybody else worked on perfecting it.

MINERVA: Oh? A little modern day prejudice at work?

JAKE: (*wincing*) Ouch!

GEORGE: So, tell us about how the industrial revolution started.

MINERVA: Ok – and then we'll call it a night. The industrial revolution is really more a story of humanity and its plight than it is of technology...

Developments in Eighteenth Century European Society

The eighteenth century was a period of economic growth that witnessed the birth of a new social consciousness and a new perspective on individuality. The field of science burst into the public realm. The debates of philosophers shifted from epistemology to the purpose of science. Science and inventions changed the economic and social fabric of the world. The widespread presence of books made an impact on the way people viewed themselves and society.

Among the industrial townspeople, the scientists, technologists, and social theorists were elevated over the throne of the monarch, the altar, and aristocracy. Rapid advances in technology throughout the eighteenth century created a sense of realism separate from the metaphysical world of religion and philosophers. Scientists worked to discover the natural or scientific laws operating in society. The new social scientists struggled to find a common empirical method of discovering and demonstrating the laws that govern society. The period of revolution in politics, science, and industry paved the way for a new application of human energy.

The Industrial Revolution, which has its roots in the mid-eighteenth century, was the product of the discoveries of men like Galileo, Descartes and Newton. Basic machines had existed for millennia (the lever, wedge, wheel and axle, pulley, and screw); by the seventeenth century there were a large number of devices created from these basic machines. These devices, however, were inefficient and awkward to control, primarily because their operation was not well understood. It was the scientific revolution in the seventeenth century that generated the knowledge to explain why machines did what they did. As a result, the efficiency of machines improved and discoveries in mechanics began to occur at an astonishing rate. Each new discovery called for the next. The rapid rate of development created a demand for new power sources, more precise parts, new manufacturing materials, and mass production.

Meanwhile, scientific discoveries affected our view of the universe and man. A philosophic view developed in which God was seen as an engineer who created a wonderful machine and set it up to run by itself. Within western philosophy, human beings began to be perceived as machines that could be made to work better according to

mechanical principles. In *The Wealth of Nations*, Adam Smith marveled at the production of a simple pin factory. Smith described a production line where ten men could produce up to forty-eight thousand pins in one day; he contrasted this production with the production of less than twenty pins each if they had worked independently. Smith described a new kind of machine – one made of both human and non-human parts (Van Doren, 1991).

The Glorious Revolution in England, the American Revolution, and the French Revolution (all based on the political philosophy of John Locke) created a desire for individual fulfillment. The time was ripe for the Industrial Revolution. People wanted to escape the life of peasantry. For those who were not landowners, the advent of the factory, with its accompanying employment, was seen as a promise of wealth and a better life-style. For those with property, factories promised a means to increase wealth.

Over the course of two centuries, European society adopted a secular perspective of the universe, the human body, and the organization of society. Humanists of the seventeenth century had charted the course, but it was the scientific revolution that gave it power. As nature was revealed, mysterious and spiritualistic explanations receded. By the early eighteenth century, countries throughout Europe banned witchcraft trials. However, changes in science and philosophy did not produce any better unified ideology than had religious authoritarianism. Some empiricists, like Hobbes, were authoritarian, while others, like Locke, advocated constitutional government. There was no common standard of values. Some scientific philosophers were certain that science would reveal a self-evident standard of ethics. By the mid-eighteenth century, men like Hume questioned the validity of such a quest. Hume proposed that scientific ‘natural laws’ would be

subject to constant revision, thereby changing the metaphysical assumptions derived from such laws. Nevertheless, the *philosophes* of the Enlightenment remained committed to the idea of the perfectibility of man, popularizing humanitarianism and reform as a social goal. Then, despite the secular views of the *philosophes*, their humanitarian reforms attracted religious sects, including those that rejected rational and mechanistic world-views.

Although humanitarianism was professed widely, the secularized thoughts of the *philosophes* did not penetrate deeply into European society in the eighteenth century. Despite the powerful influence of the small circle of elite *philosophes*, literate Europeans tended to concentrate their reading on works that reconciled traditional religious doctrines with popularized science. Religion established an important difference in respect to book ownership. A comparison of Catholic and Protestant libraries in Metz between 1645 and 1672 (based on estate inventories at the time of death) indicates that 70 percent of Protestant inventories mention books, compared to only 25 percent of Catholic inventories. The gap was consistent between nobles, legal professionals, physicians, minor officers, merchants, artisans, and the bourgeois of society. Protestant professionals owned, on average, three times as many books as their Catholic counterparts (with even greater differences between Calvinists and Catholics).

In Lutheran countries, libraries tended to be organized around a common set of religious books. In America, reading and religion were inextricably intertwined, creating a culture based entirely on familiarity with the Bible. Quaker William Penn advocated that people should keep and read a few well-chosen books. In a sermon published in 1767, Penn encouraged his congregation to read the Bible every morning and every

evening, paying close attention to the text. Repeated reading of the same texts was a norm for American Protestants. Biblical stories were read to the family and studied privately. Reading was taken for granted. In 1852 Joseph T. Buckingham, editor of the first daily newspaper in Boston, wrote that “I read every day at least one chapter, and often two or three chapters in the Bible...I have no doubt that I read the Bible through in course at least a dozen times before I was sixteen years old” (as cited in Castan Lebrun, & Chartier, 1989, p. 133). Buckingham claimed to be able to read the Bible by age five.

In his memoirs published in 1857, writer and editor Samuel Goodrich claimed that his father had completely read the Bible at least thirteen times. Read and re-read, religious texts occupied the mind of the faithful affecting their manner of speech, writing, and ways of organizing private and social life in accordance with the divine word. In America’s early Puritan culture, the Bible became the center of family life. People read for themselves and for others. They memorized scripture and incorporated it into everyday language.

In Europe, the library became the ideal place for retreat, study, and meditation for those who could afford one. Men and women took pride in their possession of books, and many of them stamped each book with a bookplate. The presence of books became linked to the habit of reading and privacy. Books were less likely to be found in open rooms in the house where guests were received, and more likely to be found in private areas such as the study (closet) or bedroom. In effect, reading created the stimulus for the development of private space. Solitary reading encouraged personal study and reflection. Reading contributed to an emerging sense of individual identity.

Reading aloud continued as a means of sharing in a public setting as well as in educating, and structuring family life. It was common for a husband and wife to take turns reading to one another and to the family, especially in Protestant families for the reading of the Bible. Among the lower classes, printed materials were available, though rarely in book form. Those who could read well usually read aloud to others. Reading material ranged from workshop instructions, to placards, religious texts, and mass-circulation books such as those in France's 'Bibliothèque bleue' or Blue Library (Castan, Lebrun, & Chartier, 1989).

There was, however, an undercurrent of popular literature that emerged during the sixteenth and seventeenth century consumed by women. The 'noble' literary genres – theology, philosophy, history, and law – either ignored women or reminded them of their duties. Catholic literature ascribed certain duties to women by virtue of their gender. Protestant literature elevated the role of the wife to equal measure with her husband, yet increased her burden of responsibility. In contrast, seventeenth to eighteenth century theatre produced tragedies, comedies, and opera that exalted the passions and gave women leading roles. Shakespeare created a number of unforgettable female characters. Plays and operas with their interludes of song and dance were experienced as festivals. In the theatre, women were portrayed as passionate, and capable of exhibiting scandalous behavior. Novels soon picked up the theme. With novels, it was possible to dream in the privacy of the home. In France alone, roughly twelve hundred novels were written in the seventeenth century and nearly a thousand in the first half of the eighteenth century (after which production declined) (Desaive, 1993).

The illiterate peasants, however, knew nothing of the *philosophes* or popular romantic literature. Enlightenment thought barely affected eastern and southern Europe. Disease still ran rampant in Europe during the eighteenth century. Most Europeans had little reason to be optimistic about their fate; deep pessimism was common. Even in England and France, population growth created challenges to city life. Many major social and political trends ran counter to the hopes of the Enlightenment. Although progress in commerce and technology increased the wealth of France and England, rapid population growth increased the incidence of poverty, vagabondage, and infanticide. At the beginning of the eighteenth century, the streets of London were a menace to public health and safety, being filled with filth, refuse, and robbers. The eastern part of London was crowded, dirty, and lawless. British opposition to reform permitted the construction of shoddily constructed, overcrowded tenements. The growth of industry and expansion of trade made many of the English parishes overcrowded. The demand for more labor in industry resulted in mill-villages and steel-works where workers were housed in flimsy tenements. The struggle to survive led to a variety of criminal acts.

A man might be hanged for any level of offense. The lack of differentiation in the scale of punishment for crimes ranging from murder to illegally cutting down a fruit tree encouraged those guilty of minor offenses to become dangerous criminals and highwaymen. The latter were regarded as romantic outlaws and it was considered fashionable to visit them in jail. However, it was debtors, not criminals, who made up the bulk of the prison population of England in the early eighteenth century. Once incarcerated, the responsibility of the state was absolved. Friends and relatives were allowed to visit and feed the prisoners for a price. If no one cared or was able to pay the

price, the state considered that the prisoners' misfortune. In 1736 a publicist wrote "It is reckoned there are about 60,000 miserable debtors perishing in the prisons of England and Wales, where hundreds die weekly of want and infectious diseases" (as cited in Burd, 1936, p. 470).

Impressment was a common way of securing crews for merchant vessels; even the Royal Navy resorted to it. Conditions aboard ships were wretched. Vagrants were rounded up and jails emptied to provide crews. The lack of public education in England reinforced the class division inherent in English society. The aristocracy believed that education would make the poor unfit for the servile positions it was their duty to fill, and make them unwilling to perform the duties necessary to support the lifestyle of their superiors.

The humanitarian spirit did make inroads in eighteenth century England. To address the problems created by the severe winter of 1709, the English government offered free transportation to all who wished to immigrate to America. English almshouses and jails became a steady supply source of servants in the colonies. Private philanthropist Thomas Coram, a retired sea captain, established a foundling hospital in 1737 to rescue orphaned children from the streets of London. Unfortunately, of the nearly fifteen thousand admitted in the first few years, fewer than a third lived to be apprenticed (Burd, 1936).

While illiterate Europeans suffered under a system designed to support the wealthy, the *philosophes* worked to introduce reforms that eventually benefited the masses. By the end of the eighteenth century, England instituted reforms designed to

improve the quality of life for the commoners. Many of the industrialists began to realize that improved working conditions produced higher yield.

As the European population grew the cities expanded. A small percentage of Europeans benefited from the new economy and produced a new urban middle class. The majority of Europeans, however, found that the availability of work did not keep pace with number of laborers looking for employment. This condition was made worse through the introduction of new labor-saving technological inventions.

Several inventions in textile machinery occurred in a relatively short period of time. In 1733 John Kay patented a flying shuttle, eliminating one of the two loom operators required in broadloom weaving. In 1767 James Hargreaves invented the Spinning Jenny, which produced a fine, but weak thread. Two years later Richard Arkwright (1732-1792) secured the rights to and produced the spinning frame for the production of a strong, heavy yarn by steam power. In 1769 Scotsman James Watt patented an improved version of the steam engine and in 1774 Arkwright opened his first textile mill in Cromford, England. In 1779 Samuel Crompton combined the features of the Jenny and the spinning frame into a 'mule' which produced thread both fine and strong enough to compete with Indian imports. The new spinning machines produced more thread and yarn than there were weavers to use it.

In 1787 Edmund Cartwright developed a power loom that could be powered by horse, water, or steam. The new loom made it possible for the weavers to keep up with the supply of yarn and thread produced. As the mule and power loom was adopted in England and Scotland, the importation of cotton soared. In 1793 another labor saving device boosted the textile industry. Eli Whitney, an American inventor, developed the

cotton gin, which could clean the seeds out of cotton fifty times faster than a person could.

The factory system existed prior to the industrial boom of the late eighteenth century. Prototypes, with specialized division of labor, existed in arsenals, shipyards, mines, ore and metal processing establishments, paper and glass plants, breweries, and finishing sheds for wool and linen cloth. Factories were established to make use of mechanized power and to allow the supervision of labor in the production process. By the late eighteenth century, factories dominated most branches of industry, dramatically increasing production, increasing efficiency and lowering costs, resulting in a continuous expansion into new markets (Botsford, 1936, Coffin, Stacey, Lerner, & Meacham, 2002; Stipp, Dirrim, & Hollister, 1972).

It was in this environment that Adam Smith (1723-1790), a friend of David Hume, laid the foundations of the 'science' of economics. Most of Smith's interest in the decency of human behavior likely stemmed from his association with Hume. The central tenet of Smith's ethical system was influenced by Francis Hutcheson (1694-1746), the first utilitarian. Hutcheson was teacher to both Hume and Smith. Smith's utilitarianism was influenced by the doctrines of the Stoics. As a result, he advocated the concept of sympathy more fervently than Hume. Together with Hume, Smith was one of the noted thinkers of the Scottish Enlightenment. He kept in close contact with Dr. Samuel Johnson (the author of the English Dictionary), Voltaire, Benjamin Franklin, Edmund Burke, and Francois Quesnay. Smith spent time in Paris in 1765-1766 making close acquaintance with Quesnay's circle of Physiocrats (French economists).

The Physiocrats formed the first ‘scientific’ school of political economy. The members of this circle claimed to have discovered the self-evident laws regulating the flow of money. The Physiocrats advocated leaving the economy to man’s enlightened self-interest and the natural laws of supply and demand. The role for government (an absolute monarchy) was the regulation of interest rates and the guarantee of the natural and limitless rights of property, security, and economic liberty. They denounced any restrictions on industry and trade and were sympathetic to manorial estate holders, believing that only agriculture and extractive industries produced wealth. The Physiocrats proposed a substitute to forced peasant labor, advocating a single tax on the land’s net product produced by free labor.

Adam Smith was born in Kircaldy, Scotland in 1723. The son of a judge, he was educated at the universities of Glasgow and Oxford. In 1759 he became a professor of logic and moral philosophy at Glasgow and published *The Theory of the Moral Sentiments*. His next work, *Enquiry*, earned him the attention of a rich aristocrat who offered support that enabled Smith to retire from teaching and devote himself to writing his most famous work, *An Enquiry Into the Nature and Causes of the Wealth of Nations* (1776). Published the same year as the American *Declaration of Independence*, *The Wealth of Nations* examined the source of society’s increasing riches and promoted free enterprise as the cause. Smith advocated a duty-free system of trade between nations and an unregulated and unfettered capitalistic system. His 900-page essay is a summary of his quest to determine how human greed and self-interest could work for the common good.

Wealth of Nations is an argument against the protectionist philosophy of mercantilism that reigned supreme in economic thought for 200 years. Smith shared the

Physiocrats optimistic faith in the natural harmony present in the economy. In contrast to the Physiocrats, Smith emphasized trade and labor, especially the division of labor, as primary sources of wealth. The division of labor, as already defined in Plato's Republic, is simply the process of allocating labor to the activity to which it is most productive. Smith recommended breaking work down into simple tasks. The advantages of doing so allowed for the development of skills, the saving of time, and the possibility of leveraging specialized skills. He, in essence, provided the foundation for the development of scientific management theory. He outlined the workings of production, competition, supply and demand, and prices. He stressed the self-regulating nature of the market as a means to reach social harmony through the participation of all people. The French referred to this type of government as *laissez-faire*.

Economics, the study of which began as a branch of speculative philosophy under Smith, came to the forefront as replacement for religion in creating social harmony. The end of the eighteenth century marks a change in the preoccupation of government from the regulation of religion and morals to the regulation of markets and economics. Economics, from this point forward, would become the main preoccupation of public policy, seen as the cure for all social ills and the source of personal contentment (Davies, 1996; Seymour-Smith, 1998; Smith, 1776/2003; Stipp, Dirrim, & Hollister, 1972).

The English Enlightenment drew to a close not by revolution, as in France, but with a growing concern about the increasing number of poor people. The optimism of Enlightenment thinkers, the champions of the perfectibility of mankind, was arrested through the work of Englishmen Thomas Malthus (1766-1834). Malthus's father was an admirer of the Marquis de Condorcet and a friend of David Hume and Jean Jacques

Rousseau (who he brought together). Thomas Malthus rejected the optimism of his father and the Enlightenment, including the idea of progress, and predicted gloom. His 1798 *Essay on the Principle of Population* predicted struggle and strife as the ultimate plight of all species of plants and animals, including the human race. Malthus' work was one of the first to attempt a systematic study of human society.

In the first edition of his *Essay* in 1798, Malthus wrote of tendencies rather than of established facts. His arguments against welfare, charity, and helping less fortunate people were based on his theory that the poor are responsible for their own state. Government intervention, higher wages, and charity would not relieve it. By his 1817 edition, Malthus had hardened his language about the poor and had given up his argument, claiming his position as a mere statement of fact. He claimed that, if unchecked, men multiply by a geometric ratio (doubling every twenty-five years) outstripping subsistence, which increases by only an arithmetic ratio. War, famine, and plague, he said, fortunately check overpopulation. Obviously, therefore, in the absence of useful wars, famines, and pestilences, starvation will prevail. His claim, that overpopulation will lead to violence by the poor against those who are better off, created quite a stir.

According to Malthus, the only remedy for the population problem, other than war and pestilence, was moral restraint, including late marriages and chastity (he rejected birth-control measures suggested by Condorcet and the Utilitarians). In this and other works, Malthus, an Anglican clergyman, established himself as the architect of the new science of economics. He described an enduring element foreign to Adam Smith's

optimism – an inescapable struggle for survival as the basic law of nature (Seymour-Smith, 1998; Stipp, Dirrim, & Hollister, 1972; Tallack, 2001).

ACT TWO

Scene 10

DAVID: Well...If you ask me the eighteenth century sounds totally depressing. It was filled with war, slavery, and economic oppression for most people. How did we ever overcome all that? That Malthus guy sounds totally fatalistic and cold-hearted.

ABBY: Makes me glad I live where and when we do! I can't even imagine believing that war, famine, and pestilence are good things. Isn't the defeat of those some of the main goals of science? I thought the industrial revolution was the result of advances in science.

MINERVA: Actually, up until recently the advances in science were based on individual discovery. And the invention of new technology was less about science than it was invention. The changes in philosophy and new discoveries in science merely instituted the notion that mankind can control its destiny. The changes in economic conditions during the industrial revolution were the result of advancing technologies created by inventive individuals.

JAKE: Are you saying that science was an unapplied discipline?

MINERVA: Exactly. Scientific discovery challenged philosophers, but as yet had made no significant changes in how we did things. We didn't really begin to feel the impact of science on technology until the late eighteenth century. For example...

ABBY: Sorry to interrupt, Minerva, but it is almost midnight and I think we better get some rest before we tackle the nineteenth century! You can pick it up in the morning.

MINERVA: I think you're right, Abby – how about a cup of warm chamomile tea before bed?

DAVID: *(getting up)* I can take care of that.

JAKE: *(following David)* Yeah – and a nice piece of cake for a bedtime snack!

ELLEN: Jake, you're always hungry – it's a good thing you didn't live back in the eighteenth century – you'd have starved to death inside a week!

GEORGE: Come on, Ellen, let's join them and then we'll head on up to bed – I want to get down early so I can check the weather and get a good seat by the fire before Minerva gets started in the morning.

(everyone says their goodnights and heads toward the kitchen and the back rooms)

(lights fade)

ACT THREE

The Third Epoch

1800-1900 AD

Scene 1

(The lights come up to reveal George and Ellen sitting in the easy chairs by the fireplace with a cheery fire blazing on the hearth)

(Jake, Toni, and Mary Ann walk into the room)

JAKE: Good morning! You weren't kidding when you said you'd be down bright and early! Did you already have breakfast?

GEORGE: No – Abby said she would set up danish, coffee, and tea on the table here in the Great Room.

JAKE: Good, cause I'm famished.

ELLEN: Cake didn't hold you over, eh?

JAKE: No, I think I burned up all that energy dreaming about arguing mechanics with Ben Franklin!

MARY ANN: Well at least yours was interesting – I dreamt I was a poor person and an ogre named Malthus was telling me I have a duty to die!

TONI: You always have been the sensitive type. I slept like a baby.

(enter Abby and David with trays of food and drinks; they cross the room and set them up on the table)

ABBY: Thanks to the advances in science I was able to make some hot drinks and bake up some fresh rolls. I sure would hate to do all that on a wood stove.

(Minerva enters while Abby is talking and takes her seat)

MINERVA: Not only that, but it would be mighty cold in here without electric heat. I'm glad the power stayed on through the storm. Looks like it has stopped snowing.

(enter Justin, Linda, Bill, and Irene)

BILL: Good morning, everyone – looks like everyone is here except Adam.

JUSTIN: I saw him heading out the back door to check out the snow – he should be here soon.

(everyone gets a cup of tea or coffee and a roll and settles in)

(enter Adam – stomping his feet and pulling off his coat)

ADAM: Brrr...nice to be inside where it's warm. Beautiful blanket of snow outside. I'd love to get on the snow shoes, but then I'd miss Minerva's stories today. Pretty weird when I pass up play time for history!

MINERVA: I'll take that as a compliment, Adam. Come on in and let's get started...Let's see...I think we left off toward the end of the eighteenth century.

BILL: Yes, with the intriguing thought that science and technology began to change our philosophy during the late 1700s.

MINERVA: And so it did...

During the late eighteenth and the early nineteenth century, science and technology took a giant leap, creating new challenges for philosophers. Philosophers debated the philosophy of Kant – incorporating empiricism, alternately rejecting and including metaphysics, and promoting the rejection of religion as a superstition while adopting a spiritualism that was transformed into fanatical nationalism. Hegel (1770-

1831) tried to explain the human soul through his emphasis on the historic nature of existence. (Nodoushani, 2000).

Meanwhile, there were no philosophers who questioned the danger of applying mechanistic principles to human beings. No one questioned whether a human being should be required to stand in an assembly line of nine other human beings, repeating the same task day in and day out in order to produce forty-eight thousand pins.

The nineteenth century was devoted to facts. Science and the scientific method were the basis of investigation and invention. Steam power, electricity, the battery, the electric motor, electromagnetism, the light bulb, the telephone, the typewriter, the calculator, photography, and a myriad of other fascinating, life-changing technologies were developed. It was amidst this onslaught of invention that radical scientific and economic theories were presented. Physics joined with chemistry in probing the visible and invisible nature of matter and motion. There were hundreds, if not thousands, of discoveries that changed and sometimes improved the quality of human life and often accelerated the changes of the industrial period.

On the eve of the new century, Italian physicist Alesandro Volta (1745-1827) experimented with electrical generation and developed the first electric battery. Prior to Volta's experiments, the only form of electricity that could be experimented with was static electric charge, which was produced when glass or amber was rubbed with a cloth. Experimenters collected the static charge in a device known as a Leyden jar, but the rapid discharge limited what could be studied using electricity. Through a series of observations in unrelated experiments, Volta conducted an experiment in which he stacked alternating discs of silver and zinc, separated by layers of cardboard soaked in

brine. His 'Voltaic pile' produced the first controlled source of continuous electric current. He realized that the continual production of electric current required an energy source, but assumed that the current was generated when two different, physically connected metals are applied to any moist body.

The generation of electricity provided the necessary element for advances in chemistry. Joseph Priestley (1733-1804) and other English experimenters used Volta's battery in the electrolysis of water into hydrogen and oxygen. Sir Humphry Davy (1778-1829), who served as a lecturer at the Royal Institution in London, conducted experiments using large versions of Volta's battery. On dipping wires connected to the battery into water he noticed that oxygen and about twice its volume of hydrogen bubbled around them. Davy felt sure that the ratio of oxygen to hydrogen should be exact without any by-products. He conducted additional experiments to prove his theory. He then moved on to use electricity to break down other substances. Experimenting with potash and soda, Davy discovered and named potassium, sodium, calcium and other metals. Davy's assistant, Michael Faraday (1791-1867), who later became director of the Royal Institution, and other scientists continued to develop Davy's Newtonian insight that chemical affinity is electrical (Stipp, Dirrim, & Hollister, 1972; Tallack, 2001).

In 1820 Danish physicist Hans Christian Oersted (1777-1851), French scientist Andre Marie Ampere (1775-1836), and Faraday all three experimented and published new discoveries in electromagnetism. Oersted demonstrated (through accidental discovery) that electric current in a wire could deflect a compass needle. Ampere proposed that electromagnetism could be explained in short-range electric forces acting in straight lines (in accord with Newtonian concepts). Faraday demonstrated that a

current-bearing wire could rotate around a magnet (or vice versa), thereby creating the first electric motor. In 1831 Faraday conducted experiments to test his theory that magnetism could be transformed into electricity. Through his experiments, Faraday invented the dynamo, in which a permanent magnet is pushed and pulled through a coil to induce an electric current in the wire; this became the basis for the generation of all electricity regardless of the primary source of energy (Tallack, 2001).

Encouraged by the application of the scientific method to objects of matter, the new field of biological research emerged. Biological research developed along two independent directions that seldom converged and sometimes offered conflicting interpretations as to the process of human development. One field dealt with biochemistry, physiology, and heredity. The other investigated the development of species in the course of world history.

Biochemists explored plant life and made discoveries that were useful to agriculture, such as the nitrogen cycle of plant nutrition and the process of photosynthesis. Other biologists explored the heredity and the cellular structures common to all living tissues. Research through the seventeenth and eighteenth centuries had demonstrated that many creatures begin life from a single-celled egg. In 1826 German biologist Karl Ernst von Baer discovered the first mammalian egg in a dog and later confirmed his observations in other mammal species. Von Baer laid the foundation of modern embryology, describing embryonic development of several vertebrate species from the egg stage to birth or hatching. He described the layers of cells (germ layers) that develop into the various organs. He argued that development proceeds from a homogenous state to a heterogeneous state. His discoveries put to rest the Aristotelian

theory that life begins with some kind of a formative fluid (provided by the male) (Tallack, 2001).

Gregor Mendel (1822-1884), an Austrian monk, explored the mathematical distribution of inherited traits in peas. His work produced the basis for the application of mathematics to genetics, making the study of heredity a more exact science. Mendel succeeded in making sense of inheritance where others had previously failed. His success was due in part to his quantitative approach and the use of probability theory. He also concentrated on the study of discrete characteristics, such as the color of the flowers. Others had attempted to study attributes such as height, which does not have discrete states. His work was ignored for over thirty-five years. In 1900 three biologists (Hugo de Vries, Karl Correns, and Erich Tschermak von Seysenegg) independently worked out Mendel's laws and each credited him as the original discoverer.

Late in the century, research in bacteriology made a significant impact on the quality of daily life. The work of men like Louis Pasteur (1822-1895) and Robert Koch (1843-1910) demonstrated that it is possible to control nature through the accumulation of knowledge. Pasteur's research on fermentation and putrefaction led him to the conclusion that living organisms are responsible for certain chemical reactions. He succeeded in controlling wine spoilage, silkworm disease, rabid hydrophobia, and the transmission of microorganisms in liquids and on surgical instruments. Adding to Pasteur's body of knowledge, Robert Koch isolated and identified the bacilli responsible for tuberculosis and cholera and demonstrated that rat-borne fleas were responsible for the transmission of bubonic plague. Koch also developed rules (known as Koch's postulates) for ascribing a disease to a specific microbe. Based on Pasteur's research,

English surgeon Joseph Lister deduced that wound infection was due to bacterial contamination. In 1867 he began soaking his instruments and dressings in a disinfectant (carbolic acid). Additional research by biochemists improved surgical procedures through the application of aseptic procedures and chemical anesthesia (Tallack, 2001).

ADAM: I can see how science improved the quality of life. But I don't get the connection to philosophy.

MINERVA: No? Do you think that science affected our perception of how much control we can have over our environment?

ADAM: I guess so.

IRENE: But advances in chemistry, physics, and biology weren't the only significant scientific events. I think the whole idea that man is supreme fouled up science.

JAKE: Why?

IRENE: Just look at what the whole argument over creation has done to our view of the world.

BILL: Irene's right. Darwin and his theory on evolution started the whole debate that has undermined Biblical authority.

MINERVA: Yes and No, Bill. Darwin didn't change our views, we were already in a philosophical position to look for an answer that put man in charge of his destiny rather than God. Darwin just happened to come along with his work on the origin of species at a time in history when we were ready to use it as a reason to support our a new philosophic perspective.

BILL: Maybe you're right, Minerva...I guess I'd rather blame Darwin than accept the

idea that so many have so willingly accepted a different version of creation than myself. But I still don't think there is as much empirical evidence supporting evolution as there is creation by the Divine.

MINERVA: It is that debate that caught the public imagination in the nineteenth century...

While the first line of biological research produced positive outcomes in medicine, genetics, agriculture, food production, and other human endeavors, it was the second line of research that occupied public opinion during the second half of the nineteenth century. The dominant climate of opinion during the last half of the nineteenth century was less congenial to genetics and more interested in research into the origin and development of species. This field of study may arguably have made a more significant impact on human interactions than the rationalist movement of the *philosophes* in the eighteenth century, and reached its synthesis in the writing of Charles Darwin (1809-1882).

Botanists, zoologists, and paleontologists had accumulated large quantities of data on living and extinct species of life. A few scientists prior to the nineteenth century developed an account for species differentiation into mutually infertile categories of plants and animals. There was a great deal of speculation on whether the earth had changed by catastrophes, such as the biblical flood and volcanic explosions, or whether it had changed gradually by processes still in operation. In 1785 James Hutton (1726-1797) published his *Theory of Earth*. Expanded in 1795 and revised by his mathematician friend John Playfair in 1802, Hutton theorized an endless terrestrial cycle by which the earth

renewed itself. Hutton held that natural destructive processes were required for the formation of fertile soil to support plant, animal, and human life. However, if all destructive processes were in only one direction, all land would eventually end up in the sea. Undoubtedly, in accord with a Newtonian view of the universe, a wise Deity would build in a regenerative process. He hypothesized that a search of Nature would reveal the processes that continually reconstitute the land. For Hutton, the process was heat and pressure. He suggested that the Earth has a central fire, accounting for earthquakes, volcanoes, and mineral veins. Therefore, through a continual, steady state process, the continents are continually being reformed out of the debris of former ones. Although criticized in his own day, his work became hugely influential through the work of Charles Lyell, and later Charles Darwin.

For years, Hutton argued his theories with his friend and fellow Scotsman Sir James Hall (1761-1832). In 1797 Hall converted from his Neptunist theories (a theory that land was first laid down under the sea) to the Plutonist views of Hutton (the theory that land is formed through a dynamic process including earthquakes and the formation of rock by heat and pressure). Hall began to experiment with rock formation after hearing that a spilled sample of bottle glass had slowly cooled into a stony-like substance. He managed to replicate the process under controlled conditions. He went on to experiment with other natural substances, artificially producing different rock types in the laboratory, supporting the concept of a steady state of catastrophic geology (Tallack, 2001).

Between 1799-1804, German naturalist Alexander von Humboldt (1769-1859) and French botanist Aime Bonpland explored South America, Mexico, and the United States. On their scientific quest, von Humboldt and Bonpland collected botanical and

geological specimens, examined the volcanoes of Colombia and Ecuador, (von Humboldt climbed the volcano Chimborazo in Ecuador), observed a meteor shower, and measured the decline in magnetic intensity between the poles and the equator. Von Humboldt was the first person to establish a link between the ecological environment and the plants and animals adapted to it. He insisted that nature should be seen from a global perspective and created a world map marked by isotherms and isobars (areas of equal temperature and pressure levels) (Tallack, 2001).

Franz Joseph Gall (1758-1828) made significant contributions to the study of the human brain, although many of his conclusions were erroneous. His greatest contribution was an innovative way of dissecting the brain, starting from the brain stem and following the nerve fibers into all areas of the brain. His most famous contribution, though misled, was his mapping of the brain. Gall studied medicine at the French city of Strasbourg in 1777, where he was introduced to the comparative anatomy of Johann Hermann (1738-1800), who taught that there was a close relationship between man and apes. In 1785 he received his medical doctorate and set up a successful practice in Vienna. In 1792-3 Gall was convinced that he had discovered localized regions of the brain that were associated with innate universal faculties. He called these regions 'organs', a term common in Vienna for localized brain modules. In 1792 Gall began to collect human and animal skulls and plastic moulds of brains in 1792 in order to study the development of cranial contours in comparison to the behavioral characteristics of a particular animal or criminal (in the case of human skulls). In 1796 Gall began lecturing on his findings, and by the early nineteenth century he was an international sensation. He taught that a given indentation or protrusion on the surface of the head was evidence of the corresponding

development of the brain just beneath it. Gall and his student Johann Kaspar Spurzheim (1776-1832) worked out detailed charts as guides for the assessment of intellectual abilities and personality characteristics based on the shape of the head. His theory became known as phrenology (science of the mind). While the scientific community later rejected his theories, his teachings caught the imagination of the public. His work, however, did spur the scientific community in the direction of brain research (van Whye, 2002; Viney & King, 1998).

In 1809 French naturalist Jean-Baptiste de Lamarck (1744-1829) published *Philosophie Zoologique*, in which he shared his lifetime systematic study of the cosmos. Earlier in his career he published treatises on chemistry, meteorology, geology, and invertebrate animals. His *Philosophie* offered a grand view of the development of the world. Lamarck argued that animals possess a quality he called *besoin* (translated need or want). His most famous example was that of the development of a long neck in the giraffe based on its 'need' to graze on the leaves at the tops of trees. Over generations, the giraffe produced a form that enabled it to fit into an ecological niche. Lamarck's hypothesis was widely attacked because it undermined the prevailing notion that organic species were a manifestation of the divine plan. Lamarck's hypothesis remained a challenge to geologists and biologists (he himself coined the term 'biology') until Darwin offered another version of organic change over time (Coffin, Stacey, Lerner, & Meacham, 2002; Tallack, 2001).

The French scientist Georges Cuvier (1769-1832) made fundamental contributions to geology, paleontology, and zoology. Cuvier and Alexandre Brongniart, independently, and at the same time as English surveyor William Smith, discovered the

principle of stratigraphic geology. During the course of his scientific investigations, Cuvier realized that all vertebrate animals have a common skeletal plan and he developed a method of science now known as comparative anatomy, by which the fragmentary, incomplete, and even mixed fossil bones of extinct creatures could be reassembled into anatomically viable form.

Cuvier reassembled the bones of various fossilized mammals, revealing startling forms of extinct mammals. In 1796 Cuvier used a lithograph to demonstrate that the extinct *Megatherium* of South America was a giant ground sloth. In 1804 he reconstructed the skeletal remains of extinct mammals found in the Paris basin. Cuvier's discoveries did not shake his belief in a created universe. A staunch anti-evolutionist, Cuvier opposed the ideas being developed by his French contemporaries, including Jean-Baptiste Lamarck. In his *Preliminary Discourse* of 1812 he claimed a catastrophic perspective, stating the life on earth was often disrupted by catastrophic events that may have at times shaken the entire crust of the earth (Tallack, 2001).

Between 1830-1833 Charles Lyell (1797-1875) published three volumes of his *Principles of Geology*, selling over 15,000 copies, which eventually ran to eleven editions, the last of which was published in 1872. Lyell advocated the principle of 'uniformitarianism', the concept that 'the present is the key to the past'. He opposed George Cuvier's catastrophist views and supported James Hutton's approach, which stated that natural phenomena can be reasonably explained only by forces currently in effect ('actual' causes). Originally, Lyell extended his hypothesis to the fossil record. He expected to find representatives of all types of organisms in even the oldest rocks, denying any evolutionary change in the various species. Then, in 1859, British naturalist

Charles Darwin (1809-1882) formulated a convincing hypothesis of organic evolution that shook the world (Tallack, 2001).

Charles Darwin was born in Shrewsbury, England in 1809 into a wealthy and highly respected family. His grandfather, Erasmus Darwin, was a doctor and author of numerous works, including *Zoonomia* (also known as the *Laws of Organic Life*), which hinted at a theory of evolution. His father, Robert Waring Darwin, was also a prosperous doctor.

Darwin began his university studies in medicine at Edinburgh (1825), where he became interested in natural history, especially crustaceans, sea creature, and beetles. Deciding that he held no interest in medicine, Darwin entered Christ's College, Cambridge in 1827 to study theology. While at Christ's College, Darwin became a friend of J.S. Henslow, a scientifically inclined clergyman and professor of botany, who encouraged his interest in natural science. Darwin also read and was greatly influenced by the *Personal Narrative* of Alexander von Humboldt. After earning his theological degree in 1831, he received an appointment as a naturalist, without pay, to a government-sponsored expedition aboard the *H.M.S. Beagle*, a ship chartered for a scientific exploration on a trip to Africa and South America. Darwin set sail with a copy of Lyell's *Principles of Geology* in hand. The voyage lasted nearly five years, providing Darwin an opportunity to study the variations of animal life first hand.

Throughout the course of his voyage, Darwin corresponded with scientists, such as geologists Charles Lyell and Adam Sedgewick. His letters were read before scientific societies. By the time he returned to London in 1835, Darwin was a well-known and respected naturalist. His first published work, an account of his voyage entitled *Journal*

of Researches, appeared in 1839 (the same year in which he married). Over the next eight years Darwin and his family lived in Kent where he continued his research and worked on a book presenting his theory of evolution.

In 1858 the naturalist A.R. Wallace sent him a paper he wrote that independently laid out the argument for natural selection. Wallace requested Darwin's assistance in getting published. Darwin's friends advised that he gather materials to demonstrate his earlier development of the theory and have an account of his ideas read alongside the theory of Wallace in front of the Linnaean Society. The next year, 1859, Darwin published an abridged version of his life's work, *On the Origin of Species by Means of Natural Selection*. Darwin had delayed publication of his work because he recognized the potential cultural consequences of publishing an argument for evolution. He had observed public reaction to Robert Chambers' anonymously published *Vestiges of the Natural History of Creation* in 1844. Chambers had taken great care to credit God and still argue for an evolutionary explanation of natural world. Although immensely popular, the backlash of rhetorical anger frightened Darwin, who wanted none of that response to his work. Thus, the *Origin of Species* never directly engages religious questions but it does repeatedly claim a scientific explanation of natural process by secondary causes as superior to explanations of natural process by special creation.

Ironically, Darwin learned to think and argue a scientific explanation of nature from his theological studies and in part from a book dedicated to demonstrating the evidence of God in nature. Darwin admired the brilliant powers of argument evident in William Paley's *Natural Theology* (1802), which was required reading at Cambridge University for over fifty years. Paley made the argument that he saw 'contrivance', and

therefore a contriver, in the adaptation that he detected in all living organisms. The deeper Paley explored, it became clearer to him that there is intent and design in all of nature. Darwin took joy in observing the same adaptations. What he saw, however, was not a great designer, but evidence of the astonishing adaptations of nature as mere historical accident. In describing the intricacies of a bee hive, Darwin noted that

He must be a dull man who can examine the exquisite structure of a comb, so beautifully adapted to its end, without enthusiastic admiration. We hear from mathematicians that bees have practically solved a recondite problem, and have made their cells of the proper shape to hold the greatest possible amount of honey, with the least possible consumption of precious wax in their construction. It has been remarked that a skillful workman, with fitting tools and measures, would find it very difficult to make cells of wax of the true form, though this is perfectly effected by a crowd of bees working in a dark hive. Grant whatever instincts you please, and it seems at first quite inconceivable how they can make all the necessary angles and planes, or even perceive when they are correctly made. But the difficulty is not nearly so great as it at first appears: all this beautiful work can be shown, I think, to follow from a few very simple instincts (Darwin, 2004, p. 186).

Darwin then set out to describe the possible evolution of the hive-bee in comparison to bumble bees, which use their old cocoons to hold honey and sometimes add short tubes of wax making separate and irregular rounded cells of wax. His premise was that

the most wonderful of all known instincts, that of the hive-bee, can be explained by natural selection having taken advantage of numerous, successive, slight modifications of simpler instincts; natural selection having by slow degrees, more and more perfectly, led the bees...[through the] motive power of the process of natural selection...to having succeeded best, and having transmitted by inheritance its newly acquired economical instinct to new swarms, which in their turn will have had the best chance of succeeding in the struggle for existence (Darwin, p. 194).

In addition to his chapter on instincts (as cited above), Darwin included chapters on variation under domestication, variation under nature, the struggle for existence, natural selection, difficulties on the theory of descent with modification, hybridism, the

imperfection of the geological record, the geological succession of organic beings, geographical distribution, and mutual affinities of organic beings.

Darwin, like Paley, was stunned by the high degree of adaptation of organic species to their environment. Darwin, unlike Paley, went for the simplest explanation as he saw it. In his conclusion Darwin summarized his view of nature:

I view all beings not as special creations, but as the lineal descendants of some few being which lived long before the first bed of the Silurian system was deposited, they seem to me to become ennobled. Judging from the past, we may safely infer that not one living species will transmit its unaltered likeness to a distant futurity...As all the living forms of life are the lineal descendants of those which lived long before the Silurian epoch, we may feel certain that the ordinary succession by generation has never once been broken, and that no cataclysm has desolated the whole world. Hence we may look with some confidence to a secure future of equally inappreciable length. And as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection (Darwin, p. 384).

In one fell swoop Darwin brushed aside the millennial old belief in the biblical flood and the intervention of God into creation and human affairs. There was no anger in the attack, just a gentlemanly presentation of the 'scientific facts'. Darwin, sensitive to the limits of his arguments, anticipated the questions he assumed would exist in the minds of his readers. These anticipations strengthened the credibility of his theory. Darwin knew what he had failed to prove. In his chapter titled 'Difficulties on theory' he identified the flaws that might be fatal to his theory.

Despite the enormous controversy generated by *Origin*, it was an immediate success, going through six editions in Darwin's lifetime. He devoted the rest of his life to expanding parts of the arguments presented in *Origin*. His later works include *The Variation of Animals and Plants under Domestication* (1868), *The Descent of Man*, and

Selection in Relation to Sex (1871), and *The Expression of the Emotions in Man and Animals* (1872).

Darwin's theory of natural selection was immensely popular among laymen and was quickly adopted by some members of the scientific community. Following the publication of *Origin*, several scientific works were published in support of Darwin's theory. His theory produced a radical re-conception of man. His theory ran counter to the accepted position of man's position in the universe. Rather than being a special creation of God, man was now seen as merely another, albeit a more advanced, creature on the tree of life (Faragher, Buhle, Czitrom & Armitage, 2000; Levine, 2004).

Darwin was not without his detractors, including his old Cambridge professor Adam Sedgwick. Sedgwick, once a great fan of Darwin, felt that *Origin* was a threat to both religion and science. Sedgwick accused Darwin of blasphemy, brutalization, the degradation of the human race, and the sin of pride. Sedgwick took exception with the popularity of Darwin's theory, and, with the support of the Archbishop of Dublin, he published an article for the *Spectator* review in which he cast aspersions on Darwin's suggestion that man had evolved from a savage-man without external help. Samuel Wilberforce, Bishop of Oxford, joined the fray and with the help of scientist Richard Owen, published an article in the *Quarterly Review* labeling Darwin's theory as wantonly hypothetical and conjectural, without the smallest basis in fact. He objected as well to Darwin's consistent use of vocabulary – 'I can conceive,' 'it is not incredible,' 'I do not doubt,' 'it is conceivable' – as language dishonorable to science, having the effect of discrediting the objectivity of science and reducing scientific truth to the status of fantastic conjecture.

The attacks of Sedgwick, Owen, and other scientists upset Darwin's friends. But the attacks by Wilberforce infuriated them. Darwin himself was more tolerant of Wilberforce and was angered by the attacks of Sedgwick and Owen. He may have been more indulgent of the opinions of a bishop than of fellow scientists. Darwin wrote the *Origin* in a format designed to appeal to laymen. He thought scientists were too committed to old conceptions of species to admit new ideas on the subject. What shocked him was that their objections were not only professional but also religious; the religious issue having played no part in his own thinking. He was unprepared for the prominence of religion in the judgments of prominent professional scientists. Curiously, the reviews written by laymen and clerics, while focusing on the religious implications, tended to be more tolerant and amiable than those of the professional scientists.

Religious motives played a large part for most scientists who responded negatively to Darwin. Prior to the appearance of *Origin*, science and religion had achieved a balance. The evolutionary theory of Lamarck had been discredited. Only a few weeks before the publication of *Origin*, the *Saturday Review* had commented on the favored status of science; after the publication of *Origin*, the *North British Review* remarked with regret that the peaceful interlude between science and religion had been shattered.

In 1860 Thomas Huxley (1825-1895) described the status of Darwinism in the scientific community as being condemned by an overwhelming majority. The effect, however, was less condemnation than confrontation. The annual meeting of the British Association was held at Oxford in June 1860. Darwin, claiming illness, excused himself from the proceeding. *Origin*, then six months old, was acknowledged by both friends and

enemies as the most important event in the recent history of science – it was scheduled as a subject of two papers at the meeting. The meeting attracted a large audience of undergraduates, women, and clergymen, in addition to amateur and professional scientists. The most curious of the presentations was a discussion sparked by a paper presented in the Zoological Section of the British Association.

The paper “The Intellectual Development of Europe considered with reference to the views of Mr. Darwin” by John William Draper drew an analogy between science and society: as the progression of species was determined by immutable laws of nature, so too was the intellectual progression of mankind. Draper later published his famous *History of the Conflict between Religion and Science* in which he spelled out the progression of mankind from religious barbarism to scientific enlightenment.

Darwin’s supporters provided an interesting reaction to the paper. Most notably, Huxley was repelled by the sweeping and uninformed generalizations that Draper used to apply Darwinian theory to society. The lecture by Draper was delivered to a packed audience of over seven hundred people. The discussion afterward, which was what everyone was waiting for, was opened by two speakers, an economist and a clergyman, both of whom objected to Draper and Darwin on the religious question. The undergraduates who had collected in one corner of the room shouted down both men. They also shouted down the next speaker who offered support for Darwin. At last, Bishop Wilberforce took his turn on the floor. Wilberforce’s speech was a recitation of his article in the *Quarterly Review* that was to appear a few days later. Wilberforce ridiculed Darwin and Huxley. He appealed to his audience to answer whether woman, as well as man, was supposed to be derived from a beast. He then turned to Huxley and asked if it

was through his grandfather or his grandmother that he claimed descent from a monkey? Waiting patiently for Wilberforce to finish, Huxley opened with a defense of *Origin* as a legitimate scientific hypothesis. Furthermore, he went on to explain that it was not Darwin's intention to establish a direct relationship between man and ape, but only the descent of both, through thousands of generations, from a common ancestor. Huxley then added his final blow to the arguments of the Bishop, in effect accusing him of meddling in the affairs of science, with which he had no experience, and attempting to obscure science with aimless rhetoric.

The excitement over Huxley's comments was tremendous. Bishops were rarely publicly attacked. The audience leaped from their seats, shouting at one another. After the audience was calmed down, additional speakers debated the merits of Darwin's theory. The meeting dissolved after Darwin's friend, botanist Joseph Hooker, accused Wilberforce of failing to read *Origin*, or of being familiar with the basics of botany. He went on to cite his own experience and conversion to Darwinian theory. His was the last word. History records that an initially hostile audience was won over by the cool, quiet, scientific demeanor of Huxley. The clergy, however, were unmoved by the argument. Many of the ladies were offended by Huxley's impiety. And the undergraduates may well have been more aroused by the contest of wit than by the contest of ideas. The scientists appear to have been dissuaded to change their original positions; those in favor of Darwin remained so, those who opposed his theory found no evidence to change their position. The session merely proved to harden the position of each side in the debate.

Younger scientists tended to be more receptive to Darwin. The younger men, without a store of historical knowledge, were more open to influence. Where their elders

might be inhibited by social conservatism, they were emboldened by social rebelliousness. Darwin's theory fed into the perennial battle of old versus modern, providing the young with the material necessary to assert themselves over their elders and superiors. Huxley, while an adamant supporter of Darwin, feared just this type of rebellion in the adoption of Darwinian theory. Huxley concluded, in his publication *Evolution and Ethics and Other Essays* (1898), that

As I have already urged, the practice of that which is ethically best – what we call goodness or virtue – involves a course of conduct which, in all respects, is opposed to that which leads to success in the cosmic struggle for existence. In place of ruthless self-assertion it demands self restraint; in place of thrusting aside, or treading down, all competitors, it requires that the individual shall not merely respect, but shall help his fellows; its influence is directed, not so much to the survival of the fittest, as to the fitting of as many as possible to survive. It repudiates the gladiatorial theory of existence...Let us understand, once for all, that the ethical progress of society depends, not on imitating the cosmic process, still less in running away from it, but in combating it. (as cited in Stipp, Dirrim, & Hollister, 1972, pp. 372-373)

Huxley spoke for a dying cause in his generation. Most 'scientific' ideologies that advocated the use of force – nationalism, racism, class conflict, and unrestrained economic competition – seized Darwin's theory to prove ideological alignment with the laws of nature. Scientists also used Darwinian theory to justify exploration into new areas (Himmelfarb, 1962; Stipp, Dirrim, & Hollister, 1972).

Not all were enamored by Darwin's theory. In each generation there has been a small number of reputable scientists who have doubted Darwin's theory and have reminded their colleagues of Huxley's warning about truths that begin as heresies and end as superstitions. Some have even echoed Huxley's early judgement that natural selection is not even an established theory but only a tentative hypothesis. Even Darwin validated this point

In fact the belief in Natural Selection must at present be grounded entirely on general considerations...When we descend to details, we can prove that no one species has changed; nor can we prove that the supposed changes are beneficial, which is the groundwork of the theory. Nor can we explain why some species have changed and others have not (Darwin, as cited in Himmelfarb, 1962, p. 443).

Darwinism spread rapidly, despite the warnings by some scientists, as well as warnings from Darwin himself. His theory became a justification for a wide variety of disparate scientific theories, social movements, and political actions. Darwinism became the new gospel, accepted at face value as fact. There were a few scientists who adhered to the theory, but who recognized that their commitment was more an act of faith than of demonstration. August Weismann (1834-1914), a geneticist and zoologist, admitted to the leap in logic required to accept Darwin's theory and explained why, from a scientific perspective, this leap was necessary:

Just as in this instance, so is it in every individual case of natural selection. We cannot demonstrate any of them...We shall never be able to establish by observation the progress of natural selection...What is it then that nevertheless makes us believe in this progress as actual, and leads us to ascribe such extraordinary importance to it? Nothing but the power of logic; we must assume natural selection to be the principle of the explanation of the metamorphoses, because all other apparent principles of explanation fail us, and it is inconceivable that there could be yet another capable of explaining the adaptations of organisms, *without assuming the help of a principle of design*...We accept it not because we are able to demonstrate the process in detail, not even because we can with more or less ease imagine it, but simply *because we must, because it is the only possible explanation* that we can conceive (as cited in Himmelfarb, 1962, p. 443).

What is at issue here is faith in science itself. Darwin's hypothesis provided a naturalistic, mechanical, objective, impersonal, and efficient system that accounted for a maximum number of phenomena in the most parsimonious manner. Darwinism was so easily accepted because it provided the simplest solution, devoid of metaphysical explanation.

Darwinism was even adopted in economic theory. As economic conditions changed in the nineteenth century the doctrines of economists broke into several strains. One of these strains was the conservative liberalism of Herbert Spencer (1820-1903). Although intended to explain the evolution of species, Darwin's theories were adopted by Spencer and joined to Malthusian economics. The theory of evolution was used as justification for economic practices that became known as Social Darwinism. It was Spencer who coined the phrase, the 'survival of the fittest'.

As a political philosopher, Spencer championed individualism and condemned collectivism as a vestige of primitive society left over from the earliest stage of social evolution. He argued that state programs designed to lessen economic and social hardships were primitive and counterproductive. Assistance programs, in his estimation, undermined the individual's natural tendency to adapt, thereby undermining the goal of society, which is the development of vigorous, prosperous citizens and the advancement of civilization.

Nationalists embraced Social Darwinism in order to rationalize imperialism and the warfare that accompanied it. In the late nineteenth century, Spencer's doctrine was used as justification for racism. Along this line, white supremacists claimed that the white race had proved itself superior, proving it the most fit to survive, and earning whites the right to dominate and rule. Society, like nature, was a matter of competition.

Conversely, some anthropologists, pioneers of a new scientific discipline, borrowed evolutionary theory to support their thesis that no culture could be claimed as better than any other; all societies adapt to meet environmental needs. Social customs are the product of adaptation and cannot be declared 'good' or 'bad', introducing the concept

of cultural relativism (Barzun, 2000; Faragher, Buhle, Czitrom & Armitage, 2000; Himmelfarb, 1962; Levine, 2004).

ACT THREE

Scene 2

BILL: I suppose I will have to admit that mankind was searching for a new answer to support a philosophy that wrested control of the universe from God.

MINERVA: The appropriation of Darwinian theory is representative of a philosophy in search of evidence.

JAKE: You might call it inductive thinking – using ‘evidence’ to develop a hypothesis rather than deductive, where a hypothesis is tested through experimentation and empirical evidence.

IRENE: So...even though Darwin admitted that his evidence was inconclusive and that he lacked any proof of evolution, we just grabbed hold of his ‘evidence’ and used it to justify our behavior?

MINERVA: It is more complicated than that, Irene. Science actually affected generally accepted philosophy even before Darwin. Positivism, or the empirical method, was applied to humans before Darwin came along. His theories just played into the prevailing philosophy that man is nothing more than another animal, open to study like any other creature in nature.

ADAM: How did the study of man lead to that?

MINERVA: Positivism was a system of thought that developed from the empirical sciences...

Positivism and the Social Sciences

The origin of positivism is credited to French philosopher Isidore Auguste Comte (1788-1857) and advanced through the writings of German physicist Ernst Mach (1838-1916). Comte created the word *sociology* and is regarded as the founding father of empirical and positivist sociology. He thought that people could be dealt with on as scientific a basis as any other matter in the universe. For Comte the word *positive* was synonymous with *scientific*. Building on the foundation laid by his friend Saint-Simon, Comte presented a three-step theological-metaphysical-positivist cycle in the evolution of society. The theological stage is a period where man relies on the supernatural to explain what he cannot; at the metaphysical stage man attributes effects to abstract but misunderstood causes; at the positive stage man finally reaches awareness and understanding of the purely scientific laws that control the world. Comte believed that through science man could control the world.

Comte worked to found a positivist church; a religion of humanity, in which humanity was worshipped instead of God. Comte was strongly committed to an evolutionary view. He believed that every branch of knowledge had to evolve from a primitive state. He would have appreciated Darwinian theory. The element that Darwin lacked was the hard evidence required by the positivist approach (Seymour-Smith, 1998).

Like Comte, positivists generally agree that 'essences' should be removed from science, they adopt a nominalist view of language, believe it is possible to distinguish between facts and values, and that values should be kept out of science. Any claim for which there is no evidence is considered by positivists to be mere speculation. No matter

how enticing the speculation, it cannot be accepted as knowledge until the claim is verified through empirical methods (Oldroyd, 1986; Phillips & Burbules, 2000).

BILL: But Darwin admitted that he didn't have empirical evidence.

MINERVA: I know, but remember, Darwin's theories were incorporated into a new philosophical system that held science and empiricism in high regard. Scientists who adopted his theory did so because it fit their philosophy on the origin of man. It explained human existence apart from the metaphysical existence of God.

DAVID: But evolution has been proven, hasn't it?

MINERVA: No, the debate is still raging.

JUSTIN: So what? – why does it matter whether we believe in evolution or creation?

BILL: It affects how we view the human soul.

MINERVA: And... if mankind is not of Divine origin, then it is possible to manipulate humanity in the same way we manipulate the rest of the physical environment. We just have to figure out what makes us tick...

Positivist theories joined with Darwin's theory of evolution, creating a revolution in science that made it possible, for the first time, for man to be studied as an object of scientific investigation. The reach of positivism into the social sciences meant that areas previously considered the realm of philosophy were now subject to empirical study (including areas such as ethics, moral development, and human behavior). Positivism is based on, and gave impetus to, the reductionist tendencies that exist within the scientific

community; reductionist thinking implies that the laws and theories of one branch of science might be used to fully explain the laws and theories of another branch of science.

Ernst Mach applied positivism to his study of physics, mathematics, and experimental investigation of the sensory processes. Mach's ideas were developed apart from Comte's influence. His background in experimental physics instilled in him a respect for solid evidence and he regarded himself as a positivist philosopher of science. In his rejection of hypotheses concerning matters beyond the reach of experimental inquiry, Mach was in complete agreement with Comte.

Mach first read Kant's *Prolegomena* when he was fifteen, which led him to his understanding of the 'nature of things' a couple of years later. Like a number of philosophers, at a young age Mach had a vision of the essential nature of reality and spent much of the rest of his life working out the details and implications of his vision. He claimed his vision to be the idea that the world and the ego appear as 'one coherent mass of sensations'. Mach rejected the Kantian domain of 'things in themselves' as a hypothetical superfluity. In Mach's view, all scientific laws and principles rest on empirical foundations and are verified by experience. There are no Kantian mental categories.

In *The Analysis of Sensations and the Relation of the Physical to the Psychical* (1886) Mach classified the human 'Ego' – or sense of self – as nothing more than complexes of sensations. Mach attempted to provide an account of the complexes of individual elements of sensation and suggested that all scientific research should be concerned with the relations between the elements of sensation. If knowledge is gathered through the experience of sensations, it follows that physics and psychology are not

distinct fields of inquiry. The objective of the positivist, according to Mach, was to purge epistemology (and science) of all metaphysical elements. He claimed that all scientific concepts were traceable back to particular sensations.

Mach opposed the nineteenth century idea of atomic theory. The chemists' atoms seemed analogous to the Kantian 'thing in itself'. Atoms could not be seen or touched and it was impossible to determine direct phenomenal relationships between them.

Atomic theory, however, was helpful in coordinating a mass of empirical data. He agreed that atomic theory was helpful in discussing scientific principles, especially for scientists brought up in the Western intellectual tradition, but that didn't make atoms real. Mach's perspective on the instrumentality of atomic theory became known as *instrumentalism*. If the atoms were 'useful' in science, but were not necessarily thought to be real, then they might be regarded as 'instruments' of research. Mach held that scientific explanation is nothing more than the economical description of phenomena by means of scientific laws.

Mach dealt with the contradiction between his instrumentalist views and his belief in a positivist approach to science by drawing on ideas from the popular evolutionary theory of his day – the Darwinian theory of evolution by natural selection. Scientific hypotheses that adapted well to facts survived; those that did not were eliminated. Through this interesting convolution of thought, Mach was able to accept the commonly defined role of hypotheses and theories in science (Oldroyd, 1986).

MINERVA: Science was even applied to the area of moral philosophy...

Utilitarianism

Utilitarianism is rooted in the tradition of empiricism and represents the extension of empiricism into morals and politics. The term utilitarianism referred to the political doctrine of Claude Helvetius who built a morality based on people's aversion to pain and attraction to pleasure. His ideas were later expanded on by the English lawyer and philosopher, Jeremy Bentham (1748-1832).

The Utilitarians inherited from Bentham a belief in legal reform, empirical methodology, a fledgling psychology of motivation by pain and pleasure, and a belief that the purpose of government was to create the greatest good for the greatest number. Bentham at first supported a laissez-faire system of government and economics, as promoted by Adam Smith. He later adopted a philosophy that advocated the use of reason, law, primary education at public expense, universal male suffrage, and the restriction of birth as a means to improve social conditions.

Bentham's influence made a significant impact on the development of moral philosophy. Philosophers divide between absolutists and consequentialists. Absolutists believe that there are absolute wrongs that should never be done regardless of the consequences realized by not doing them. Consequentialists believe that the morality of actions should be measured in accord to the consequences, and that there is no action that may not, in special circumstances, be justified by its consequences. Prior to Bentham, most philosophers were absolutists because of their belief in natural laws or natural rights. Bentham's attack on the concept of natural laws and natural rights had the effect of making consequentialism respectable in moral philosophy.

An example of the difference between absolutists and consequentialists is the question of right and wrong. A believer in natural law (an absolutist) who was told that a ruler had massacred thousands of people would immediately call his actions wicked; a consequentialist would first ask for more detail. What were the consequences of the massacre? What would have happened if the ruler had allowed the people to live? Was there a greater good served? Only after collecting this information would the consequentialist make the determination of moral goodness or evil.

Consequentialism is now widespread among philosophers. Questions on medical ethics are debated on grounds of absolutist versus consequentialist perspectives. Cost-benefit analyses are based on the principles of consequentialism. The challenge of Bentham's philosophy is that it further undermines the Judeo-Christian concept of God, from which absolutist principles emanate.

Bentham, an Oxford-educated lawyer, was interested in penal reform. He rejected the theory of retributive punishment, whereby justice was meted out to the guilty through punishment equal to their crimes. He believed that such retribution, which simply rendered evil for evil, only served to increase the amount of evil present in the world and did nothing about restoring the balance of justice. He believed the only purpose of punishment was the deterrence of evil; if the punishment inflicted had no deterrent effect, then it should not be inflicted in cases where it would have no deterrent effect on the criminal or others.

Bentham did not believe in the administration of punishment in excess of the amount required to deter the action. He drew up a set of rules that laid out the proportion of punishment to offenses. His intent was to create a realization of the cost versus benefit

in committing a crime. He objected to the system in effect in most prisons. He was able to garner support from William Pitt's government to build a model prison of his design. Although approved by an Act of Parliament, the measure was finally defeated by ducal landowners who did not want a prison near their London estates.

Bentham elucidated the concept of intention more clearly than any previous writer. He explained that an act might be intentional without its consequences being so. And that consequences might be directly intentional (when the outcome is intended) or obliquely intentional (when the outcome is suspected but wasn't the purpose of the action). He also distinguishes between intention and motive. He claimed that motives are neither good nor bad. The only measure of the morality of an act is the agent's belief about its consequences.

The utility of Bentham's principle, that men seek pleasure and avoid pain, is that it enables ethics to be conceived in quantitative terms. Bentham conceived a 'felicific' calculus to answer all statable questions of right and wrong. Translating pleasure and pain into quantitative relation to one another, then it is possible to foresee a solution to all moral problems.

Bentham wrote a number of papers on legal and constitutional matters, most of which remained unpublished in his lifetime. In 1817 he published a plan for parliamentary reform. He died in 1832 a few weeks after the Great Reform Bill passed. The Bill balanced the power in Parliament between the aristocracy and the new industrial towns and counties of the north and west. For the first time, the middle class was represented in the House of Commons and the right to vote was extended to a larger population of property holders.

The ideals of democratic liberalism were also adopted within the church in England. Evangelical churchmen spread a gospel of social consciousness that held society, not just individual sins, responsible for squalor and poverty. Bentham extended his principle of pleasure and pain into politics. It gave rise to the philosophical problem that occupied nineteenth-century utilitarians – the problem of political freedom. If the right thing to do is to maximize human pleasure, then we must identify how to summate the pleasure of individuals. And, there is no *a priori* reason for thinking that the pleasure of one individual should not be subjugated for the greater benefit of the whole. It was this problem that occupied John Stuart Mill (1806-1873) in his most celebrated work on moral theory, *Utilitarianism* (1861) (Kenny, 1998; Scruton, 1995; Seymour-Smith, 1998).

Mill was the son of James Mill (1773-1836) a Scottish philosopher, economist, and journalist. In 1808 Bentham became a friend of James Mill and shared in the education of his young son, John Stuart. James was a vigorous champion of Bentham's utilitarian philosophy. James raised his son to be a genius, and one inculcated in utilitarian philosophy. John learned Greek at age three, logic at age twelve, and economics at thirteen. During his youth he was dedicated to study with little, if any, recreation. At the age of twenty, he experienced a breakdown and spent a time consoling himself with poetry, and particularly by the poetry of Wordsworth.

After he recovered, Mill devoted much of his time to the promotion of utilitarianism. He was very industrious and published a voluminous amount of material on philosophy while holding a full-time job for thirty-five years with the East India Company. Mill softened the utilitarianism of Bentham as a result of the claims by critics

that the supposition that life has no higher end than pleasure was a doctrine worthy only of swine. By the middle of the nineteenth century, Mill was the recognized leader of utilitarian ideals. He remained committed to the principles of a liberal democracy, but became sympathetic to certain socialist points of view, including reducing property rights as a means to increase social justice.

Mill admired Berkeley and tried to separate his theory of matter from its theological context. He agreed with Hume in his philosophy of mind, but had difficulty accepting that his own mind was simply a series of sensations. Mill published his *System of Logic* in 1843 in which he presented his principles of causality and proposed that all knowledge is empirical in character. Mill believed that all knowledge was developed through a means of induction, moving from the particular to the general, and that both deductive reasoning and logic were subordinate to empirical induction.

Mill's *System of Logic* begins with an analysis of language. According to Mill, all names denote the things they are names of, and general terms denote the things they are true of. He used the term 'name' very broadly and included in the term not only the names given objects but also the descriptive words related to them. For example, Socrates can be denoted in the terms 'Socrates', 'man', and 'wise'.

In 1848 Mill wrote *The Principles of Political Philosophy* followed by his pamphlet *On Liberty* in 1859, which remains the classic statement of the liberal political position. In the pamphlet, Mill sets out his guiding principle for liberal individualism

The sole end for which mankind are warranted, individually or collectively, in interfering with the liberty of action of any of their number, is self-protection. The only purpose for which power can be rightfully exercised over any member of a civilised community, against his will, is to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant (Mill, as cited in Kenny, 1998, p. 288).

The only part of an individual's conduct that is subject to the rules of society are those actions that concern others. Over himself, his own body, and his own mind, the individual is sovereign.

In 1861 Mill published the pamphlet *Utilitarianism*. In the same year, working with his wife Harriet, he published his treatise *The Subjection of Women*, which was the most vehement tract on the rights of women since the *Vindication of the Rights of Women* written by Mary Wollstonecraft in 1792. His work on the rights of women helped to get common rights granted. In Mill's estimation, the condition of women revealed society's notions about authority, coercion, and individuality (Coffin, Stacey, Lerner, & Meacham, 2002; Kenny, 1998; Scruton, 1995; Seymour-Smith, 1998; Stipp, Dirrim, & Hollister, 1972).

MARY ANN: So what is wrong with science setting the stage for moral philosophy.

Sounds like it resulted in some good things to me.

MINERVA: Yes, it did, but it also set the stage for the incorporation of positivist science into all areas of philosophy. The 'good' impact of science on philosophy is a matter of perspective. And the interpretation of scientific evidence hinges on one's philosophy.

JAKE: Come on, Minerva, facts are facts.

MINERVA: Really? So is Darwin right – we are related to the apes?

JAKE: Yes.

BILL: Based on what?

JAKE: Based on genetic research and observation.

BILL: So how do you explain human intellect?

JAKE: Just like Darwin said – natural selection.

BILL: So do we have a soul?

JAKE: No. When we die, we die. Just like the apes.

BILL: I think otherwise. If you want to be scientific about it I can give you evidence that rocks were created instantaneously in time and that all the supposed ‘missing links’ aren’t links at all. My evidence is just as strong as yours.

MINERVA: My point exactly. We find the evidence to prove what we are looking for. I can provide evidence to prove either theory. So which one do you choose to believe?

ELLEN: (*looking a little uncomfortable*) Come on guys – why do we have to get into religion?

BILL: I don’t call it religion Ellen. I’m a chaplain and can tell you about a lot of different religions – that’s where I think we get into conflict. This is more about my basic philosophy of faith in Divine creation.

ELLEN: But can’t I believe in the beauty of the human spirit without arguing religion. Why does it matter if you think we were created or evolved. We can still have a spirit.

MINERVA: Spoken like a true romantic.

ELLEN: Is that good or bad?

MINERVA: Once again – it depends...

German Romanticism and Idealism

While the English, French, and American *philosophes* were applying the concepts of Newtonian rationalism, German intellectuals followed the lead of Rousseau and worked to renew a sense of awe in the spiritual aspects of humankind, thereby giving birth to a movement referred to as romanticism. In its broadest sense, romanticism can be defined as the attempt to “bring nature and man into unity through the shaping power of the imagination” (Websters, 2002, p. 326) and reliance on the emotions or intuition to determine what is real and true. Rousseau’s romanticism appealed to intellectuals who reacted negatively to the impersonal nature of rationalism, the emphasis on scientific analysis, and the resulting materialism of the Enlightenment thinkers. Romanticism was appealing to the post revolution generations in Europe with its elevation of emotion, freedom, and imagination. Although the *philosophes* had emphasized feelings as a motive force guided ideally by reason as a means to achieve an end, the romanticist emphasized the stimulation of intense feelings as an end in itself, as a means to connect with ultimate reality.

In a short period between 1770 and 1789, a new generation of German intellectuals (mostly from the middle and lower-middle class) led the revolt against the classical (Old World) traditions entrenched in the German society and universities, referred to as the period of ‘Storm and Stress’ (Sturm and Drang). Thereafter, Goethe (1749-1832), Friedrich Schiller (1759-1805), and Johann Gottfried von Herder (1744-1803) attempted to strike a balance in drama and poetry between the turbulent spiritualism of romanticism and a rational desire for knowledge. Having at first welcomed the French Revolution, they were disillusioned with it by the end of the

century. German poets and dramatists adopted the ideals of Rousseau and sought an absolute reality beyond the limitations of everyday life. From poetry and drama they turned to ancient folktales and history (especially history of the Middle Ages). Casting aside all sense of scientific detachment, the German idealists sought a manifestation of a World Spirit (*Weltgeist*) in successive 'spirits of time' (*Zeitgeist*) that worked toward a beneficial purpose behind all the bloodshed that marked their own time.

In Germany, Herder's work laid the foundations for subsequent nationalist politics. He conceived of each nationality as a living organic being with its own personality and myths, and that each nationality had a duty to develop its own particular spirit. He theorized that the founding fathers of each nationality were granted a divine revelation from the World Spirit that was embodied in late medieval folk poetry. Herder rejected the idea that the intellectual elite could produce a real civilization and that it came instead from the culture of the common people (*Volk* in German). Herder did not believe in the superiority of the German people; no one *Volkgeist* was better or worse than any other. On the contrary, he regarded the Slavic peoples as embodying some of humanity's best and most democratic ideals. In Herder, Czechs, most of whom were educated in German universities, found a call to study their own language and traditions, providing a stimulus to Czech nationalism.

Conservative German romantic authors and historians resisted efforts to import 'foreign' democratic and liberal ideas, arguing that institutions (and nations) must evolve organically. The development of laws and institutions is contingent on the past. After the French Revolution, writers in France, England, and Germany argued in favor of giving

the ancient institutions (such as the national church) a larger role in the shaping of society.

Throughout western Europe, novels were published that romanticized the deeds of lower-class heroes and heroines; poetry elevated the power of emotion to bind all humankind regardless of social class. Rousseau's key themes of nature, simplicity, and feeling were prevalent in the romanticized writing of the English romantic poets William Wordsworth (1770-1850), Samuel Coleridge (1772-1834), and John Keats (1795-1821). Choosing natural pastoral or exotic subjects, these authors attempted to communicate directly and intuitively with nature through the inner spirit of man. Their literature evoked emotion and stimulated images ranging from childhood memories to the inner creation of far-off places. In rejecting the Enlightenment, they praised all it had condemned: religious fanaticism, emotion, spirited enthusiasm, and faith. Literature, politics, and religion ran together to create a nationalistic furor. Coleridge, and French conservative Francois Chateaubriand, argued that the religious experiences of the national past are part of the present and that to remove them would destroy the fabric of a nation's society (Coffin, Stacey, Lerner, & Meacham, 2002; Stipp, Dirrim, & Hollister, 1972).

(as everyone is sitting listening to Minerva, the lights fade)

ACT THREE

Scene 3

(lights come up)

ELLEN: Romanticism sounds like a good thing gone bad.

MINERVA: But it didn't have to be. Once again, we have to examine our philosophy or find ourselves subject to the opinion and dominion of others. Romanticism had the opportunity to elevate the beauty of the human spirit, or to use passion as a means to unite and segregate people from one another. Both were done...

Between 1781 and 1807 the work of Kant, Fichte, and Hegel gave rise to German Idealism, also referred to as Absolute Idealism. At age 32 Johann Gottlieb Fichte (1762-1814) was appointed to the chair of philosophy in Jena. His lectures on the science of knowledge (published in 1804 under the title *Wissenschaftslehre*) were immensely popular.

Fichte laid claim to a Kantian system of knowledge. According to Fichte, Kant provided evidence that there are only two possible philosophies: idealism and dogmatism. Although Fichte admired Kant, he believed that his empirical approach to knowledge was inconsistent and he attempted to advance Kant's philosophy. Kant held the notion that our experience is caused by 'things in themselves' and dismissed things metaphysical in nature. Kant demonstrated that idealism can explain everything that dogmatism explains, without making assumptions beyond the reach of observation. Fichte attempted to revise Kant's system to include metaphysics. Fichte held that the idealist looks for the explanation of experience in intelligence, the dogmatist in the 'thing-in-itself'. Fichte proposed that the thinking subjects, and not the physical objects, create experience. Thus, the starting-point of idealist philosophy is in the Self (das Ich) (Kenny, 1998; Scruton, 1995).

Starting with Ego or pure self, Fichte set out to demonstrate how the whole of consciousness could be derived from it. He claimed that he was not talking about an individual self, but of a single, absolute ego, which created all phenomena and all individual selves. In his later works, Fichte referred to the absolute ego as God, but he also laid belief in a divine being outside of a moral order as nothing but superstition. His philosophy, although inconsistent, provided a springboard for other German idealist philosophers.

Like other Europeans, Fichte championed the French Revolution as an emancipation of the human spirit. Yet, after Napoleon invaded and conquered much of Germany, his attitude changed dramatically. He adopted Herder's notion of a *Volkgeist*. The individual spirit was no longer the panacea for cultural ills; rather, it was the spirit of a whole people as expressed in its customs, traditions, and history that was to be revered. In 1808 Fichte delivered a series of *Addresses to the German Nation*, in which he declared the spirit of the German people to be superior to the French and other nations. Though the world had not yet heard from that spirit, he predicted it soon would. The French military commander in Berlin, where Fichte delivered his address, considered the speech an academic exercise and did not bother to censor it.

Fichte's views were used as a call to rally the German people and throw out Napoleon and the French. The Prussian Baron Wilhelm von Humboldt supported the idea of a special German spirit, claiming that "Other nations do not love their country in the same way as we love Germany" (as cited in Coffin, Stacey, Lerner, & Meacham, 2002, p. 811). German nationalism was driven by a fusion of individuality with the collectivity of the German culture and spirit (Coffin, Stacey, Lerner, & Meacham, 2002; Scruton, 1995).

G.W. F. Hegel (1770-1831) was the most influential of the German Idealists. Hegel studied theology at the University of Tübingen and taught at Jena until the University was closed down by the French invasion. In 1807 he published *The Phenomenology of Spirit*. He became a professor at the University of Heidelberg in 1816, was called to a chair in Berlin in 1818 and remained there until his death from cholera in 1831. Hegel believed that the philosopher had a special insight into history that was lacking in ordinary historians. The philosopher knows that reason is inherent in the world and, therefore, the history of the world presents us with a rational process. This knowledge can be reached either by metaphysics or by inference from the study of history itself (Kenny, 1998).

Hegel's approach to knowledge was based in the historical nature of existence. Hegel argued that all categories of understanding are a type of human achievement that are the result of human interaction with the environment and are culturally influenced. The relationship is dynamic. Humans respond to the world around them and understand the world based on active engagement with it. The knowledge we acquire is constantly changing, allowing us to overcome limitations we may have previously experienced. Beyond the application of an empirical approach, Hegel argued for the existence of a World Spirit (Geist), as described by Herder, that reveals knowledge throughout history. Hegel believed that the World-Spirit, the collective human consciousness, progressed from one period to the next through dialectical steps toward self-consciousness. Knowledge accumulates and is shared through reading and instruction (Hartnack, 1986; Nodoushani, 2000; Sedgwick, 2001).

Hegel secularized the Protestant doctrine of providence by advocating the role of the World Spirit as a force that is beyond human ability to change. According to Hegel, human reason can only intuitively understand the metaphysical nature of the World Spirit. He believed that the World Spirit would eventually reach fulfillment in the Absolute, a state of perfection. Meanwhile, conflict is a natural part of the struggle as opposites clash to produce a new order. Each subsequent order generates a new set of opposites and the conflict is repeated, frustrating all aspirations for human happiness. Hegel saw the conflict as warfare between different spiritual states, each bound to assert its ideas against those of others. Therefore, in this spiritual dialectical clash, leaders such as Napoleon emerge who make the spiritual battle real in a material universe (Hegel, 1977/1807; Seymour-Smith, 1998; Stipp, Dirrim, & Hollister, 1972).

It was Hegel's argument for the existence of a World-Spirit that once again initiated the inclusion of metaphysics into philosophic circles. The philosophers of the early to mid-eighteenth century expected metaphysics, and consequently religion, to disappear in favor of science. The philosophers of the late eighteenth to early nineteenth century (beginning with Kant in 1781 and culminating with Hegel in 1807) recognized that radical empiricism was inadequate to explain human knowledge and therefore they reintroduced metaphysics as a means to explain the human ability to know. Hegelian idealism dominated philosophical thought in early nineteenth century Germany and promulgated a powerful group called the 'Young Hegelians.' This group of intellectuals influenced German literature and politics. Adopting Hegel's philosophy that history, rather than eternity, is the key to our salvation, the Young Hegelians attempted to apply the philosophy of history to other areas of thought.

BILL: Sounds almost pantheistic. German Idealism replaced faith in the divine with faith in human history.

GEORGE: Like Minerva says, that depends on your perspective. It sounds to me like the Germans used a convenient philosophy to defeat Napoleon – they developed a little national pride to keep themselves from being absorbed by France. Sounds practical to me.

ELLEN: Oh George, why does everything have to be practical?

GEORGE: If it's not practical it's a waste of time. Like this conversation, if I weren't snowed in I probably wouldn't be sitting here. What's the point if it doesn't change the way I do anything? What we study and talk about has to have a practical application and make a difference. Otherwise, why bother?

MINERVA: Spoken like a true pragmatist George. Do you know the basis of pragmatism?

GEORGE: No, but why does it matter? It works for me.

MINERVA: German idealism seems practical to you?

GEORGE: Yup. It got results.

IRENE: And results are all that matter.

GEORGE: In the business world, that's all I can measure.

MINERVA: Do you know the results of German idealism?

GEORGE: No.

MINERVA: Karl Marx was an idealist.

GEORGE: He was a revolutionary.

MINERVA: Yes, but his philosophy was extended to a set of results...

Marxism

One of the most important philosophers to emerge from the group of Young Hegelians was Karl Marx (1818-1883), who attempted to synthesize German Idealism with English empirical economics, to which he added his own theory of history. Most of the writings of Marx, much of it in conjunction with his lifelong friend Friedrich Engels (1820-1895), were published posthumously. Although Marx was influenced by Hegel, he rejected many of Hegel's views. What he retained was a modified version of Hegel's perspective on history. Hegel saw history as the development of consciousness. Marx argued that material forces moved history. Marx explained the development of consciousness in terms of material reality. It was because of this perspective that Marx theorized that capitalism would be superseded by a more humane social arrangement. Unlike Hegel, who viewed ownership of property as an indispensable instrument of freedom, Marx viewed ownership as a form of alienation and bondage (Hartnack, 1986; Scruton, 1995).

Marx's materialistic perspective of history was based in economics. He saw history in terms of labour. It was labour that generated the language, customs, and institutions through which consciousness arises. Marx described human consciousness in terms of three moments, aligned with three stages of history, which correspond with social activities. The first stage is that of natural man, where nature dominated man and the institution of property was not yet developed. During the second stage, the ownership of property flourished during which time man dominated and became separate from

nature. In his view, the ownership of property also separated men from one another and promoted self-alienation. Marx believed the second stage was due to be replaced by communism, where man so completely masters nature (through the sciences) that there is no longer a need for private property and the separation of man from man is transcended (Scruton, 1995).

Marx's greatest impact on society during his lifetime may well have been his use of rhetoric to taunt the bourgeoisie into adopting aggressive behavior. Marx had the ability to describe events in terms of proletarian revolt, causing the bourgeois capitalists to employ force, and then using that force as a weapon against the capitalist system. It is interesting to note that rebels throughout the world have learned from Marx – to build support by antagonizing the ruling class into the use of military force and then enlisting public sympathy to expand their influence (Van Doren, 1991).

ACT THREE

Scene 4

DAVID: Seems like the late 1700s and early 1800s were a time in Europe when there was a lot of unrest and revolutionary ideas.

ADAM: I dunno – sounds a little like the conversations we have on campus to me.

MINERVA: You're not far off. Young people in college seemed to embody the same spirit of challenge to the status quo as the world seemed to embody at the beginning of the nineteenth century.

ADAM: You mean we had a world full of rebels.

MINERVA: I'd call it more of a mood. The world was rocked by years of revolutions

that had taken place from America to Europe. Napoleon was defeated and the borders of the world were changing. Rationalism had failed to provide any answers and the world seemed to be riding on the high tides of emotion...

Romanticism and Liberal Reform (1815-1870)

Following Napoleon's defeat, the victorious European powers met at the Congress of Vienna in 1814 to draw up a peace settlement. As a result of the Congress, the boundaries of the states of Europe were established. The participants knew that revolution had produced war. International peace, therefore, required stability and the ability of nations to block revolution. As a result, they re-established the dynasties and international boundaries that existed prior to 1789. Fear of an aggressive Russia prompted many European nations to support the maintenance of a larger confederation of Germanic states (with Prussia as the predominant force) and the independent kingdoms of Bavaria, Wurttemberg, and Saxony. Poland was divided between Russia, Prussia, and Austria.

In the nineteenth century, liberalism referred to those who opposed the old regimes of Europe. Liberals opposed the re-establishment of the old dynastic monarchies. The goals of the liberals consisted of three basic components. In politics, they sought an end to traditional inherited privileges and the replacement of hereditary monarchy with a constitutional system and direct representation in government. In economics, liberals sought efficiency in government and a system that promoted commercial enterprise. Socially, liberals believed in individualism and in the value of well-intentioned members of society and the contributions individuals could make to social order and prosperity. At

the time the new United States fascinated liberals. Liberals counted as their members John Stuart Mill, who was a defender of personal liberty, and Alexis de Tocqueville (1805-1859).

Tocqueville traveled to the United States in 1831-1832 to study the government, social life, prison systems, and slavery. His goal was to capture that which was promising and that which was dangerous in the new American model. He published *Democracy in America* (1835-1840), which made his reputation as a political scientist and earned him substantial profit.

In the early nineteenth century, the Romantic Movement influenced liberalism. Romanticism spread from Germany and England into the rest of Europe. The emphasis on rationality and reason during the Enlightenment was replaced with Romanticism, which stressed emotion, freedom, and imagination. Romantics considered intuition, emotion, and feelings better guides to truth and human happiness.

Romanticism might best be described as a cultural mood rather than a movement. It affected the lives of individual men and women. It cut across political lines and provided images and ideas for both conservatives and liberals. Jean Jacques Rousseau was the founding father, although the banner was picked up and the mood advanced through writers in Germany and England. Romantic poets in England included William Wordsworth (1770-1850), Samuel Taylor Coleridge (1772-1834), and William Blake (1757-1827). These early Romantic poets championed the individual imagination and poetic vision. Wordsworth considered emotions to be a reflection of the soul and therefore the core of humanity. Like Rousseau, Wordsworth emphasized the ties of feeling and compassion that bind together all humankind, regardless of class and nature.

Feelings, in Wordsworth's opinion, were humanity's most trustworthy teacher. Blake criticized the corruption of industrial society; he referred to factories as 'dark satanic mills' that were a blight on the English landscape.

Romanticism sparked an interest in, and a fanciful image of, the chivalric periods in history. Folk tales and folk songs were rediscovered. A sense of history that was secondary during the rationalism of the eighteenth century was reawakened and took on an emotional and idealized form. The brothers Grimm, editors of *Grimms' Fairy Tales* (1812-1815), traveled throughout Germany collecting folktales that were published as part of a national heritage. The poet Friedrich Schiller retold the drama of William Tell (1804), to make it a rallying cry for the 'reawakening' of a national German consciousness. In Britain, Sir Walter Scott produced novels that popularized the history of Scotland; Wordsworth's *Lyrical Ballads* sought to evoke the virtue and simplicity of English life. The Middle Ages were seen as a time when humans were concerned with transcendental ideals: the knight fighting for justice, mysterious cathedrals, grand castles, and the ballads of great deeds. An emphasis on individual feeling and soul could be illuminated through this historical vision, providing an escape of imagination from the realities of an industrial society.

Literature, art, and architecture all reflected the Romantic mood. In architecture, the longing for a lost age of chivalry expressed itself in a resurrection of the medieval style. In Germany the Gothic cathedral of Cologne was constructed (1842-1880). In England the Houses of Parliament (1840-1857) were built in the Gothic style. Castles were built throughout Europe in imitation of what an idealized medieval castle would

look like. The Romantic mood became a core part of European culture, emerging at different times and in different ways throughout Europe (Mosse, 1988).

English romanticism reached its height in the early nineteenth century. The next generation of English romantic poets included Lord Byron (1788-1824), Percy Bysshe Shelley (1792-1822), and John Keats (1795-1821). These young authors adopted the ideals of romanticism with a passion that displayed itself vividly in their lives; their adventures seemed to personify their poetic themes. Lord Byron was an aristocrat, rich, handsome, and defiant. He had affairs with countless women and earned a reputation as a libertine, rebelling against conformity and inhibition. His emotional extravagance verged on insanity. His poetry occasionally gives insight to a painful inner turmoil. Byron's poetry also expressed his defense of liberty and his bitterness toward the limitations and corruption of the world. He denounced the British legal system with its frequent use of the death penalty and defended the working-class protest movement. He died of tuberculosis after sailing off to Greece to fight for Greek independence from the Ottoman Turks (Coffin, Stacy, Lerner, & Meacham, 2002).

Byron's friend, Percy Shelley, was a poet and radical and also seemed mentally unstable. All of Shelley's major works and many of his minor ones gave a call for action of some kind. Many of his works spoke of revolt and celebration of the triumph of good over evil. Shelley was the only son of a wealthy aristocrat. At the age of twelve he was sent to Eton, where he remained for six years. At Eton he became fluent in Latin and Greek, gained an extensive knowledge of ancient literature and read both serious material and fiction. One of his professors, Dr. James Lind, an amateur scientist and radical, introduced Shelley to demonology, the occult (including the activities of the Illuminati

and other secret revolutionary societies), and the writing of William Godwin (*Political Justice*).

From an early age, Shelley's approach to politics was inexorably intertwined with his taste for secret societies and a conspiracy theory of history that he absorbed through the writings of the Abbe Barruel. One of his earliest political acts was the recommendation to radical writer Leigh Hunt to form a secret society to resist the enemies of liberty. While still in school, Shelley published two Gothic novels. In 1811, during his first year at Oxford, he wrote a pamphlet on his religious views titled *The Necessity of Atheism*, after which he was promptly expelled. Shelley rebelled against the disappointment of his father over his expulsion and turned on his family. By the end of the year, his aggressive behavior toward his own family led them to fear his violence. He was cut off financially except for a small annual pension.

Shelley seemed to thrive on change and instability. He lived a wandering life and surrounded himself with a circle of young women. He often advocated and attempted to establish a radical community of friends with sexual sharing. He married in 1810 to a conventional middle-class girl named Harriet who shared his wandering, revolutionary lifestyle for four years. In 1814 he announced to her that he had fallen in love with Mary Godwin and left a pregnant Harriet behind as he traveled to the Continent with Mary and her stepsister Claire Clairmont in tow. Shelley was appalled that Harriet would take exception with his decision. His letters to her quickly took on the tone he had used with his family. He at first tried to extract money from her and then turned against her with vehement attack. In November 1816 Harriet turned their two children over to her parents;

in December she was found dead; and she was not the first woman thought to have committed suicide after her relations with Shelley.

Shelley's life is filled with stories of the devastation he wrought in the lives of the numerous young women who were attracted to him. It might be argued, on his behalf, that he was young when he engaged in his many affairs and abandoned Harriet. He was only twenty-two when he ran off with Mary and she was only eighteen. When Byron, having fled England for good, first met Shelley on the shore of Lake Geneva in May 1816 Shelley was twenty-four and Byron twenty-eight. It was during their summer at the lake that Mary wrote *Frankenstein*, which turned out to be in some respects one of the most important of the Romantic novels. The novel, in Gothic style, centers on the arrogance of Enlightenment science and rationalism. The monster in the story is an artificially made creature that develops human feelings (Johnson, 1988).

In the fervor of their youth, the Romantic poets and novelists rejected the values of the world and presented an alternative system of their own. The search for experiences that would create intense emotional and creative leaps of imagination engendered a lifestyle outside the norms of society. The romantic style encouraged the daring to defy conventional norms. In France the picture of the romantic mood was exemplified by the French women writers Germaine de Stael (1766-1817) and George Sand (Amandine Aurore Lucile Dupin 1804-1876). George Sand defied convention by making her living as a female writer, wearing men's clothing, and taking lovers as she liked. Madame de Stael emigrated from France to Germany during the revolutionary period and played a significant role in popularizing German Romanticism in France. Victor Hugo (1802-1885) wrote poetry, plays, and historical novels that focused on the experience of

common people, including his famous *Notre Dame de Paris* (1831), and *Les Misérables* (1862).

There were conservative movements within the Romantic mood of the century, including, for some, a return to Christianity. German Romanticism was often very conservative and opposed the liberal lifestyle and views of the French and English Romantics. Wolfgang von Goethe (1749-1832) was enormously influential. His early novel *The Sorrows of Young Werther* (1774) was a Rousseau-like story of a young man's love and it enchanted readers throughout Europe. Yet Goethe resisted what he considered the excessiveness of Romanticism with its cult of feeling over restraint and order, which he considered self-indulgent and morbid. In 1790 Goethe published the first part of his masterpiece *Faust*, which he finished the year before his death. The play told the German legend of a man who sold his soul to the devil in return for eternal youth and universal knowledge. It was more classical in tone than other Romantic pieces, but still expressed a Romantic concern with spiritual freedom and human adventure.

As an intellectual movement, Romanticism was diverse and contradictory. As a cultural style, it was available to middle-class men and women who were attracted to the call for change. Romanticism stirred new thinking about the roles of men and women. In the eighteenth and nineteenth century, it was common to think of men as rational and women as emotional, or intuitive. Romanticism elevated the status of women with its emphasis on emotion and intuition. It also suggested that men could be emotional and that men and women share a common human nature. With the Romantic emphasis on individuality, emotion, the soul, and sensuality, the romantics forged new ways of writing and thinking about love.

MINERVA: The Romantic mood even extended into politics.

JUSTIN: That seems like an oxy-moron...romantic politics.

LINDA: Maybe not...we're always talking about how politicians seem to be out of touch with the real world!

TONI: Politics can get sticky...I sit on school board meetings and we can't get even that small group to agree...teachers have one view, the board another, the PTO has their own agenda...and then there's our teachers' union...Everyone wants the best for the kids, but nobody can agree!

MINERVA: Exactly. You can use the same analogy for nineteenth century Europe. With the relatively new exchange of ideas brought about by the printing press and the rapid rate of change, the entire continent was a caldron of competing ideas. Each country was dealing with philosophic and economic changes that played out differently based on their cultural history...

In Italy liberals who opposed the restoration of the old regimes adopted the Romantic mood. A secret Italian brotherhood that called themselves Carbonari met in hiding; they called for constitutions, political representation, and other liberal reforms. The Carbonari praised Napoleon Bonaparte; during the 1820s-1830s the exiled emperor became a popular folk hero. The influence of the Carbonari spread throughout Europe in the early 1820s, especially in southern Europe and France. Military officers made up a significant portion of the membership in the Carbonari and other clandestine opponents of restoration in Europe. During the 1820s, these clandestine operations led revolts in

Naples and Spain, succeeding in the process to force conservative kings to establish representative government and constitutions modeled after the French constitution in 1791.

Liberal ideas also made inroads into Russia under the rule of Tsar Alexander, who died in 1825. Following his death the Decembrists, as they came to be called, attempted to encourage Alexander's liberal-minded brother Constantine to assume the throne. The attempt failed.

Constantine refused to oppose the rightful heir, his brother Nicholas I. Nicholas quickly oppressed the uprising, ruthlessly interrogating hundreds of mutinous soldiers and condemning many to hard labor and exile. He executed the five young military leaders who led the opposition and went on to enforce his autocratic rule over all of Russia.

Of all the struggles during the 1820s, the one that captured the attention and imagination of liberal Europeans was the Greek war of independence (1821-1827). The Turkish Ottomans ruled Greece. Religious Europeans found it easy to cast the struggle as one between Christianity and Islam. Secular Europeans saw Greece on a crusade for liberty and engaged in a struggle to preserve the ancient classical heritage of the land. Percy Shelley wrote 'We are all Greeks...Our laws, our literature, our religion, our arts have their roots in Greece. But for Greece...we might still have been savages and idolators' (as cited in Coffin, Stacey, Lerner, & Meacham, 2002, p. 787). Philhellenic committees in cities across Europe raised money and sent volunteers to support the Greek cause. Men and women in Paris wore blue and white ribbons to show they had contributed to the Greek cause. The reality of the war, however, was less idealistic. Both

Turks and Greeks committed atrocities. Greek forces captured Turkish towns and massacred the inhabitants. Greeks captured the island of Chios; when Ottoman troops arrived, the Greeks killed their prisoners and fled. The Turks took revenge by massacring thousands of Greeks and selling forty thousand Greeks into slavery. In the end, the Greeks won their independence with the support of British, French, and Russian troops.

Meanwhile, in France, rebellion was fomenting once again. The Congress of Vienna restored the Bourbon monarchy in France. Louis XVI's son had died in captivity so the Congress appointed the oldest surviving brother of Louis XVI to the throne. Louis XVIII restored the nobility, but as an appeasement to the liberals he conceded to legal equality, careers based on talent rather than birth, and a two-chamber parliamentary government. However, in 1824 Louis XVIII died and was succeeded by his far more autocratic brother, Charles X (1824-1830). Charles directed the French assembly to vote to compensate members of the nobility who had lost land during the revolution and he also restored the Catholic Church to its traditional place. Reaction to Charles' monarchy was negative; confronted with the unpopularity of his regime, Charles and his ministers called new elections. When the election results went against the king, he set out the July ordinance of 1830, which dissolved the newly elected chamber, imposed strict censorship on the press, and restricted suffrage to exclude practically everyone outside the nobility. The response was revolt.

Three days of street fighting led by republicans, most of who were workers, artisans, students, and writers, resulted in Charles abdicating the throne. Some of the revolutionaries supported the establishment of a genuine republic. Others, afraid of a return to the turmoil of 1789, brought the duke of Orleans to the throne as King Louis

Philippe (1830-1848), establishing a constitutional monarchy accountable to the people. Suffrage was expanded, but was still a privilege based on property ownership rather than a right of citizenship.

The 1830s did not bring revolution to Britain, but it did usher in an era of wide-ranging reforms, establishing Britain as one of the most liberal nations in Europe. The Reform Bill of 1832 reallocated 143 parliamentary seats, most from the rural south, to the industrial north, potentially increasing the political power of the industrial middle classes. The bill did not, however, expand suffrage as a right. Only three percent of the total male population was eligible to vote. The bill reduced, but did not destroy, the political strength of the landed aristocracy. Despite the imbalance in Parliament, the members were generally more sensitive to the needs of industrialists, including their desire for policies of free trade. In 1846 Parliament repealed the Corn laws, which imposed tariffs on imported foodstuffs. Rapid industrialization in Britain also compelled legislation on a number of fronts.

In the latter half of the century, industrialization supported a growing stratum of highly skilled and relatively well paid workers (almost exclusively male). These workers created cooperative societies and trade unions whose major function was the collection of funds to be used as insurance against old age and unemployment. They believed in education as a tool for advancement and created real pressure for electoral reform. Many reformers in the Liberal party and even a few in the Conservatives, such as Benjamin Disraeli (1804-1881) joined them in their campaign. In 1867 Disraeli, by now the Prime Minister, steered a bill through Parliament that extended voting rights to any man who paid poor rates or rent of ten pounds or more per year in urban areas (this included, in

general, skilled workers), and to tenants paying rent of twelve pounds or more in the counties. Known as the Great Reform Bill, it also redistributed seats, again reallocating seats from the rural south to the large northern cities.

The 1840s proved a difficult decade for most of Europe. Poor harvests in the early 1840s started a cycle that became acute by 1845-1846. For two years in a row, the grain harvest failed completely. In Ireland a fungus hit the potato crop in 1845, 1846, and 1847 with no alternate foods at hand. At least one million Irish died of starvation, dysentery from spoiled foods, or of fever. Irish nationalists blamed their plight on deliberate callousness on the part of the British government. The potato blight also struck Germany, Scotland, and the Netherlands. By 1846 food prices on average had doubled. Bread riots broke out across Europe.

The food shortage was compounded by an industrial slowdown that threw thousands of workers into unemployment. Starving peasants and workers flooded the public-relief organizations. The inability of Europe's regimes to deal with the crisis made all of them look authoritarian and inept. In France, the republicans who had fought in 1830 quickly became disillusioned. Opposition of the ruling party in France to expand suffrage drove moderates into the camp of republicans. By 1847 the opposition was strong enough to call for electoral reform throughout France. Political meetings were outlawed; in defiance the republicans organized political 'banquets'. The government banned a giant banquet scheduled for February 22, 1848 – and another revolution broke out. Once again, amidst armed street fights, the monarch of France abdicated the throne amid increased demands for a republic.

Frenchmen finally had their wish; a new provisional government was formed consisting of a combination of liberals, republicans, and socialists. The provisional government immediately went to work on writing a new constitution and holding elections based on universal male suffrage. The provisional government removed all restrictions on freedom of speech and political activity. One hundred seventy new journals and more than two hundred clubs formed within weeks. Women's clubs and newspapers appeared, advocating the rights of women, demanding real universal suffrage, and living wages for working women. The provisional government did make an important effort in supporting the 'right to work' for all laborers and created National Workshops that offered employment in public works. Initially, plans called for the employment of up to ten or twelve thousand in projects throughout Paris. With unemployment running as high as 65 percent in the construction trades and 51 percent in textiles and clothing, workers soon flooded the workshops. By April 1848 sixty five thousand workers applied for work.

Fearing that the workshop system had become a financial drain and a threat to social order, the government closed the workshops to new enrollment in May 1848 and excluded anyone who had resided in Paris for less than six months. All applicants between the ages of eighteen and twenty-five were sent to the army. Despite the restrictions, by June the number of applicants reached one hundred twenty thousand workers. When the government shut down the program on June 21 Parisians once more threw up barricades across the city and engaged in battle for four days between June 23-26. Approximately three thousand were killed and twelve thousand arrested – the majority of who were deported to Algerian labor camps.

The French government quickly moved to bring order to the country and arranged for the immediate election of a president. Their hope was that a strong leader would bring order. Four candidates ran, with the election going to Louis Napoleon Bonaparte, a nephew of the former emperor. By 1851 Louis Napoleon lived up to his namesake and proclaimed a temporary dictatorship and asked the people to grant him the power to draw up a new constitution; by popular vote, an overwhelming majority supported his request (7.5 million to 640,000). The new constitution put into effect in January 1852 made the president an actual dictator. A year later, with the approval of 95 percent of the voters, he established the Second Empire and assumed the title of Napoleon III (1852-1870), emperor of the French.

Napoleon III courted the favor of the workers as well as the nobility. He encouraged the establishment of hospitals, and instituted a program of free medical assistance. He permitted the existence of trade unions and in 1864 instituted legislation that legalized strikes. He reconstructed Paris into a city of broad boulevards and grand open spaces, which improved the visual appeal of the city as well as decreased the chance of any successful proletarian street barricade. But, like his uncle before him, his zest for international conquest led to his defeat and the collapse of his regime in 1870 (Coffin, Stacey, Lerner, & Meacham, 2002).

The revolution of 1848 in France sparked a wildfire of revolt across Europe, taking in the cities of Berlin, Frankfurt, Prague, Vienna, Milan, Venice, Budapest, Rome, and Naples. Battles also took place in Rumania, Greece, Sicily, Switzerland, and Ireland. During the sweep of revolutionary sentiment, some governments introduced liberal changes that were sufficient to forestall popular revolutionary insurrection. Belgium, for

example, successfully checked riots by doubling the electorate to include most of the middle classes; the workers were appeased through public works and poor relief. In the Netherlands, King William II permitted the election of a parliament by his wealthier citizenry. In Denmark the king conceded to a national assembly with an elected Lower House. In Sweden, unrest led to minor concessions between 1844 and 1859 (Stipp, Dirrim, & Hollister, 1972).

In the early nineteenth century, nationalism became an important rallying point for liberals across Europe. Nationalism celebrated the achievements and ‘awakening’ of the common people. Liberals sought the development of a national economy that could better support the lifestyle of the individual. Nationalistic thinkers adopted a liberal focus on the future by connecting it to the national heritage of the past. Nineteenth century governments cultivated a national feeling as the means to unify diverse people into peaceful coexistence following the Napoleonic wars. Romantic writers and artists fueled the national fervor by idealizing the imagined characteristics of specific peoples and cultures. This fervor was most notable in the loose confederation of Germanic states, where nineteenth century thinkers and leaders adopted and expanded on the philosophy of Johann von Herder and Georg Wilhelm Hegel.

Prussia’s principal minister, Baron Heinrich von Stein and his successor, Prince Karl von Hardenberg, were more interested in achieving a Prussian nation-state than in finding a way to unite the various principalities of Germany. Stein had read Hegel and Fichte and was convinced that a strong state required citizens who were aware of their obligations to the national interest. He knew that citizens would be more willing than subjects to make sacrifices for the national well being, and so he began a reform program

to build civic equality and dismantle the system of social privilege in Prussia. The Edict of 1807 abolished serfdom and the estate system, ended the restrictions on the selling of land to the middle class, and opened trade and professions to all classes. The Municipal Ordinance of 1808 required towns and cities to elect councilmen and handle their own finances, with Berlin retaining control of national justice and security. Prussian reformers also expanded facilities for primary and secondary education and founded the University of Berlin. The work of Stein and Hardenberg answered only some of the demands of the liberalism that was spreading across Europe. Liberals, especially amongst the student population, demanded more aggressive reforms throughout the Germanic confederation. By 1848 the revolutionary movement reached Germany; kings and princes yielded surprisingly quickly to revolutionary movements. The governments agreed to freedom of the press, elections, expanded suffrage, jury trials, and other liberal reforms. In Prussia Frederick William IV, who had succeeded to the throne in 1840 and had attempted to suppress liberal reforms, faced revolutionary crowds in Berlin and finally acceded to liberal demands. More importantly, all the German states and Austria agreed to elect delegates to an all-German Assembly in Frankfurt to discuss national unification.

Delegates met for eleven months and tackled the problems of national German identity. They could not decide if Germany should be confined to German ethnic territories or include all of the Austrian Empire. Finding the challenge of defining German identity and designing a unified government an insurmountable task, the delegates finally gave up. Disillusioned by their experience to blend liberal ideals and nationalism, some immigrated to the United State, where they believed those goals had been achieved. Many of those who remained stayed committed, believing that the

achievement of half of their goal was better than none; they sacrificed liberal goals in favor of the seemingly realists' goals of nationalism. Frederick William IV retained control of Prussia and in December 1848 proclaimed his own constitution, which provided a semblance of universal suffrage without abdicating political control to the electorate, with the Crown holding the ultimate right to veto.

In May 1849 Hanover, Saxony, and a number of the smaller states signed an agreement with Prussia for political union. The larger southern states turned to Austria. The result was a military standoff, with Russia backing Austria, which forced the capitulation of Prussian attempts to assume leadership in northern Germany. Thus, Germany remained a loose confederation of 38 states.

In 1861 the Prussian throne was passed to William I (r. 1861-1888). In 1862 Otto von Bismarck (1815-1898) was appointed Premier to resolve the crises that developed after the revolution of 1848. Bismarck had served in major diplomatic posts and had distinguished himself as one of the most uncompromising foes of liberal constitutionalism, advocating instead monarchical absolutism. By 1862 battles between the liberal majority in the lower house and the monarchy led William I to appoint Bismarck, who had no scruple against ruling in violation of the constitution. Bismarck was intent on creating a new North German Confederation without Austria and set about doing so by a masterful use of limited war and political alliances. Under the leadership of Bismarck, German unification and subsequent industrialization made Berlin the capital of continental politics. In 1870-71 Prussia attacked and defeated France. In the ensuing state of euphoria, Bismarck arranged for the Federation to admit the Southern German states and proclaimed William I as the German Emperor. Germany was reunited, a conservative

absolutist monarch at its helm, and the liberals were baffled. Four months later, at Frankfurt, in the treaty between the French and Germans, France ceded the border region of Alsace and paid 5 billion francs to Germany (Davies, 1996; Coffin, Stacey, Lerner, and Meacham, 2002; Stipp, Dirrim, & Hollister).

MARY ANN: Whew! Sounds like a lot of turmoil. I always thought of the eighteenth century as a time when people were pretty uptight. All the movies show the women in long skirts and high-necked blouses. Instead it sounds like everybody was in rebellion.

MINERVA: Keep in mind, that just like today, a lot can be going on politically while everyday life goes on. People still work to feed their families, raise their children, and get by day to day. Just because an account of history sounds exciting doesn't mean that most people felt it moving at that pace. We have compressed years of change into a morning conversation.

BILL: Speaking of which – I think its time for a break...Anyone up for a snowball fight and cocoa?

TONI: I'm in!

ADAM: Me too.

(lights fade as they all head out the door toward the kitchen)

ACT THREE

Scene 5

(lights up – everyone is back in their seats)

IRENE: Great idea, Bill, I needed the fresh air.

LINDA: Me too, its beautiful outside but I can't believe how much snow we've had – its going to take a while before we can get out. I jumped in one snowdrift and Justin had to drag me out – it was up to my waist!

ABBY: Don't worry. I called the county and they have heavy equipment out. They expect to get us out by the day after tomorrow. David has a couple of our maintenance guys working on plowing out our drive. In the meantime, we've got plenty to eat and some great company.

ADAM: You can say that again! That was a great lunch, Abby, thanks. And now I guess I'm ready for good company. How's about picking up the story line, Minerva?

MINERVA: Ready to go. What do you all want to talk about next?

MARY ANN: I still want to know what happened to all those Victorian straight-laced ideals I have always heard about.

MINERVA: Alright...let's start there...

Christianity and Romanticism

Early in the nineteenth century, the Romantic Movement gave birth to a Christian renaissance that carried through the century. The first part of the nineteenth century was an age of religious revivals. Mankind seemed to be reacting en-mass to the dehumanizing factors that existed around them. Industrialization had changed the nature and meaning of

work. The resurgence of religion was also partly a reaction against the excesses of the revolutionary era, and partly because of the termination of earlier laws supporting religious discrimination.

Discriminatory laws against Catholics, dating from the seventeenth century, were removed in most Protestant states, as were anti-Protestant laws in Catholic states. Judaism was allowed in areas where it had been banned since medieval times. Only Russia enforced strict laws controlling certain religious groups; Jews, Roman Catholics, and Uniates of the ex-Polish provinces were subject to discrimination and state control. Jews were required to live within the Pale of Settlement. The Roman Catholic Church was run by the Holy Synod and denied any access to the Vatican. The Uniates were forced to convert to Orthodoxy.

In western Europe, theological debate was stimulated as a result of the new openness between Catholics and Protestants, the increased public interest in science, and the new interest in exotic religions, especially Buddhism and Hinduism. Theology joined forces with the Romantic Movement. Romantic poets like Wordsworth accused the intellect of mis-shaping the beauty of the world and sought a harmony of humanity and nature as a gateway to the soul. Rene Francois Chateaubriand (1768-1848) echoed Wordsworth's sentiments. In his *Genius of Christianity* (1802) Chateaubriand integrated Christianity with an emotional link between people and nature in an appreciation of the Divine. Chateaubriand's book was immensely popular throughout Europe. In it he rejected science and reason as capable of explaining the mysteries of life. Most important were the mysteries of human emotion. He thought the emotional manifestations of friendship and love were divine; he turned to the new science of anthropology to establish

their divinity. The first people in Asia, he proclaimed, were so in awe of the power of love and friendship that they expressed these emotions through the use of symbols. He saw Christianity as supreme because it alone could explain the essence of humanity; Christ was the unifying agent between humanity and the Divine. Redemption could explain what science never could about the nature of the human soul. This theology wasn't new, but Chateaubriand related this doctrine in a special way to the concept of Romantic unity. Christianity was the unifying emotional force for people and the whole universe. Christ was a reflection of the harmony between God, humanity, and nature.

Chateaubriand linked God to all that was sublime and beautiful. He wrote "There is one God, the grasses of the valleys and the trees of the mountains bless him, the elephant salutes him at the dawn of day, the birds sing in the foliage, the ocean declares his immensity" (as cited in Mosse, 1988, p. 49). He wrote of church bells and went on to link the effect they produced to the effect produced by all of nature. He believed that Christianity was reflected in the divine institutions that operated on earth, most notably the Catholic Church. Protestantism, in contrast, was chaos.

Chateaubriand's justification of Catholicism was not an isolated phenomenon. The unifying nature of Catholicism and its history held an appeal for the Romantic's Gothic vision. On the Continent, Catholicism was revived. In 1814 the Pope re-established the Jesuit order. In England, the Catholic revival engendered a deep crisis in the Anglican State Church. The higher offices of the State Church were occupied, not based on religion, but on politics. To many, the Anglican Church represented the antithesis of Romanticism.

Though the religious revival was strongest in Catholicism, Protestantism was also affected, though less so. More common in the Protestant countries was the continuation of emotional religious revivals that began in the eighteenth century. The Pietists on the Continent and the Wesleyans in England were two of the few Protestant groups that merged romanticism and nationalism into their approach to Christianity.

The Prussian Friedrich Schleiermacher, who was influential in the Prussian Union of Churches, provided a synthesis of German pietism and romantic idealist philosophy in his *Speeches on Religion* (1799). He claimed that religion was a matter of inward sentiment, not determined by human action or thought, and that the outward contempt displayed by people belied their true emotions. In 1811 he published *Kurze Darstellung* or 'Brief Outline of Theology'. His major work *Der Christliche Glaube* (1821-1822) is a summary of Protestant dogmatics. Like Chateaubriand, Schleiermacher tied religious experience to the contemplation of the entire universe; but unlike Chateaubriand, he stressed individual piety rather than a centralized church. Every man was a priest – dogma was secondary. For Schleiermacher the essence of religion was an extension of man's own consciousness. He claimed that "If you want to grasp the idea of religion as a factor in the infinite and progressive development of the World Spirit, then you must give up the vain and empty desire for one religion" (as cited in Stipp, Dirrim, & Hollister, 1972, p. 246). Schleiermacher considered a single, multi-national religion as a threat to the uniqueness of the individual and his national group. He felt that Christianity required attachment to each nation and he was determined to make the nation-state the mediator between God and man (Davies, 1996; Mosse, 1988).

Many Pietists refused to follow Schleiermacher's fusion of religion and nationalism. Considering the war against Napoleon a holy crusade against the anti-christ, several groups called for the formation of a supranational government in order to establish a new era of peace. The Congress of Vienna rejected their ideas.

The English Wesleyans closely resembled the continental Pietists in their emphasis on an inner religious experience, spiritual rebirth, and emotional faith. They believed that misery was the result of the original sin of Adam and could not, therefore, be totally eradicated. They did, however, believe in humanitarian efforts. The Wesleyans opposed the rational natural-rights philosophy of the enlightenment and the French Revolution and as a result became nationalists during the wars with revolutionary France. It was largely due to their efforts that the Congress of Vienna adopted provisions to bring an end to the international slave trade (Stipp, Dirrim, & Hollister, 1972).

The revolution of 1848 drew the Catholic Church into the mainstream of social and political activity. In 1848 Bishop Ketteler in Germany proclaimed the first 'day of Catholics', calling for a change in Catholic thought. In a speech he urged Catholics to emerge from their isolated positions and confront the new forces of the age. The problem of labor awaited a Christian solution. In France, the radical Abbe Hugues Lamennais (1782-1854) raised the same call. Lamennais added his desire that Catholics would emerge from their cultural isolation. He asked why Catholics should not write as good literature as Protestants? These men called on the Church to face the social questions of the day and to align with the new liberal forces of the age. Lamennais and Ketteler were the founders of liberal Catholicism, with a free Church in a free state. For them, this implied non-interference by the state into Church matters, including Catholic education.

Ketteler organized skilled workers in the Catholic Workers League with a goal of giving workers status and a pride in their work as a means to counter the divisive class consciousness that was being popularized by Marxists. Ketteler envisioned labor as an 'estate' in the medieval sense of the world. He considered each profession as an estate that would participate equally in national policy. This ideal of a corporate society that developed out of Catholicism provided an alternate for those who rejected both liberalism and socialism.

The ideals of the liberal Catholics did raise grave doctrinal issues for the Church. Ketteler's liberal views united all socially-minded Christians, including Protestants, endangering, in the opinion of the pope, Catholic dogma. In addition, Pope Pius IX (r. 1846-1878) was committed to returning the Church to its position at the beginning of the century. He was convinced that liberalism represented a danger to the Church. The *Syllabus of Errors* (1864) condemned Catholic liberalism and attempted to tighten the rule regarding heresies. Then, in 1870, the Vatican Council held that all pronouncements of the pope were infallible, something even the Council of Trent had not approved. As a result, many German and French bishops left the Council rather than assent.

It was under these circumstances that the first German Catholic political party was founded under the leadership of Ludwig von Gerlach (1795-1877). In the Netherlands, the Catholics and Calvinists combined into an organization called the Christian coalition. The coalition lasted until the papacy once more called a halt to such activities (Davies, 1996; Mosse, 1988).

Pope Leo XIII (r. 1878-1903), the 'Pope of Peace', adopted the ideals of Catholic corporatism. He advocated workers' guilds built on the concept of Christian cooperation,

which viewed work as a craft and not merely as a necessary means to earn a living. Leo believed that the resurrection of the medieval framework of guilds would restore the dignity of human beings. Employers would respect the dignity of the laborer as a guild member, a person, and a Christian. The relation between labor and employer would be governed by the Christian ideal of justice, creating interdependence between capital and labor. Through this vision, Leo saw Catholicism as the cement that would hold the divergent parts of society together.

Catholic corporatism held great appeal. Christian trade unions were based on it. The idea spread outside a Catholic framework and was adopted in 1882 by Austria in the declaration signed by both Conservatives and the future leaders of Austrian socialism. The Christian workers' guilds, however, were not socialism but an alternative to it. Pope Leo XIII opposed socialism and saw in it the destruction of human dignity and the natural law that justified the right to own property and the right to family life.

Corporatism also opposed the individualism of the liberals, advocating association in its stead. The Catholic solution to social problems differed from that of Protestants, whose concept of social reform was based on a combination of liberalism and social action on behalf of the underprivileged (Mosse, 1988).

Nineteenth-Century European Culture

Although industrialism began in the late eighteenth century, European civilization in the early nineteenth century was still predominantly agricultural. Most people still lived lives based on the seasons, working the fields, worried about the possibilities of famine and pestilence, and were ignorant of the world outside a few mile radius of their

own home. Very few were educated. Superstitions were still prevalent and the classes were divided according to family status (Kirby, 1936).

The industrialization of work in the eighteenth and nineteenth centuries brought with it a transformation and urbanization of Europe. Starting in the nineteenth century, the average European had a sense of a new pace of change. Even the more backward regions were subject to the changes in the urban areas. Industrialism brought to France and Germany the same deplorable conditions it brought to the factories of England. Both states, with their concern over the consequences of social feeling and out of a desire to maintain a healthy army, adopted factory legislation (Kirby, 1936, Mosse, 1988).

In England between 1815 and 1840 new technology brought about the complete demise of the hand weavers and knitters trade. Difficult economic times followed the Battle of Waterloo, characterized by a vicious cycle of price cutting and underselling. Handloom weavers attempting to compete with factory produced goods cut their prices to meet factory prices; they were unable to meet the frequent style changes that became the general rule in factory produced goods. Distressed by their poverty and lack of ability to compete led to the Luddite riots (1810-1820) in which tradesmen destroyed factory equipment.

Riots could not stop the increase in factory produced goods. In order to survive, tradesmen turned to the factories for employment. Workers in the early factories were predominantly men. As machinery simplified the tasks and reduced the physical effort a larger percentage of women and children were employed at considerably lower wages. In Europe, the evils of factory life were worse than in the United States. Children, some not more than six years of age, were sold to mill owners at a low price for a set period of

time, typically a year or more. Children were worked for fourteen hours a day, six days a week, and were subject to flogging by overseers if they failed to keep up the pace of work. Parliamentary investigations on the practices of factory owners and overseers led to the Factory Act of 1833, which limited hours of employment for women and children, and included the appointment of inspectors for enforcement. Similar investigations into the mining industry led to the Mines Act of 1842, which prohibited the employment of all women and any children under the age of thirteen in the mining industry.

The factory towns were overcrowded. Tenements housed a family of six or seven in a single room. Prior to 1840 there did not appear to be any sense of social consciousness to provide relief to the industrial workers and their families. There were no sanitary conveniences; the streets were not paved or cleaned. Between 1810 and 1840 the death rate in industrial towns increased until it was triple that of the rural sections. Epidemics in 1831 and again in 1848 finally prompted the towns to take action. Reports to Parliament in 1842 exposed the serious effects of unsanitary conditions on the health, morals, and productivity of urban populations. An 1848 law established a public health board, and modern science and technology were applied to the problem.

Until Parliament took action, even well meaning mill owners seemed incapable of effecting change. Good and bad were caught in the cycle of production and price-cutting. With the implementation of laws to protect workers from abuses, the benefits of industrialization began to spread to the working class. The middle class began to increase in numbers. New industries developed that provided more opportunities for profitable employment, thereby increasing wealth (Botsford, 1936; Burd, 1936b).

The threat of class conflict rose during the second half of the nineteenth century as the laboring classes began to organize, form their own political movements, and attempted to create their own culture as well. It was also the dawn of an age of mass politics. The changes brought by industrialism permeated the daily lives of individuals and traditional ways of life were being transformed. Change was no longer episodic—it was now continuous. Time seemed to move quicker, there were increasing problems in urban living, nature was being destroyed at an alarming rate; everything that had at one time been considered fixed was now in motion (Mosse, 1988).

The dominating philosophy of the new middle class was Utilitarianism – the greatest good for the greatest number. The middle class Victorian of the nineteenth century was thrifty, pious, conventional, conservative, and focused his non-materialistic impulses on moral ideals. Robert Owen (1771-1838), a common workman who became one of the richest men in England, was a Utilitarian who demonstrated that good wages and proper working conditions were not a drawback to profit (Burd, 1936b).

The theory of Utilitarianism affected religious thinking. Older Church doctrines that held poverty in esteem were rejected by those who considered sickness, poverty, and social evils the result of ignorance. It seemed far more Christian to elevate the ideal of public comfort and well being. Utilitarianism helped to make religion the servant of business (Burd, 1936c)

New means of communication and transportation developed that affected daily life. Railroads were built across Europe in the 1830s and 1840s. The telephone was invented in 1867, which made it seem possible for a person to be in two places at one time. The motor car and the bicycle enabled individuals to move rapidly from one place

to another. It wasn't until the 1890s that Berlin finally permitted the use of bicycles on the streets; previously they had been thought too dangerous because of their speed. At the same time, mass production reduced the price of bicycles so that by 1900 they became the preferred means of transportation of the German working class. Many other inventions, such as the incandescent lamp, the cinema, and new industrial technology changed the scope and activities of daily life. In the early part of the century, most countries adopted and promoted free, compulsory, government sponsored education. The illiterate masses of Europe were transformed into a literate society, capable of learning new information and operating as citizens.

A new literary-scientific set of thinkers arose out of the middle class. Thought was exchanged within this new society. For example, Herbert Spencer's *Synthetic Philosophy*, a journal he started in 1860, was subscribed to by John Stuart Mill, the historian Grote, the essayist Froude, George Eliot and her husband George Lewes, Charles Darwin and his brother Erasmus, the naturalist Thomas Huxley, geologist Charles Lyell, Tyndall the physicist, Charles Kingsley, Edward Buckle, and Sir John Herschel, in addition to other Europeans. The quest for knowledge was pervasive. Justus von Liebig, the founder of organic chemistry, wrote *Organic Chemistry in its Relation to Agriculture and Physiology* (1840), turning Germany into a nation of chemists. Germans created an industry based on chemistry, making high-grade steel, substituting synthetic dyes for vegetable colors, and creating chemical fertilizer for agricultural use (Burd, 1936b; Kirby, 1936; Mosse, 1988).

Meanwhile, the expansion in the number and the distribution of newspapers affected European thought. By the late 1880s, with the rise in yellow journalism, many

began to condemn the press as the enemy of true culture. The newspapers and journals, however, were communication channels for the transfer of values, manners, morals, and other ideologies. New modes of behavior and moral attitudes were ingrained as cultural norms during the last part of the eighteenth and early nineteenth centuries. Industrialism, which produced so much wealth, dictated moral codes. Idleness came into disfavor, sobriety was encouraged; immorality, which was expensive and produced no profit, was discouraged. The concept of respectability began as a system of manners and morals expected of the middle class and eventually spread to all classes. The new moral tone required self-restraint, control of one's passions, and self-reliance. Nudity was deemed inappropriate as it evoked sexual appetites and loss of control over one's actions. It was thought that overindulgence in sex led to nervousness and exhaustion. Personal energy was to be used for the purpose of individual advancement and social progress.

Respectability also required an acceptance of the merits of work. Laboring at one's trade or profession was considered a duty; idleness or the quest for pleasure was considered to lead to bad habits and thoughts. The Protestant religious revivals of the eighteenth century were instrumental in making the ideal of respectability a pervasive element in nineteenth century life. The French Revolution re-enforced the ideals espoused by the religious revivalists; the Revolution was seen by many as a judgment of God on the evils displayed by the nobility. The Napoleonic Wars led to the condemnation of French immorality. Purity crusades linked the Wars of Liberation against Napoleon with proper moral behavior.

Although religious revivals contributed to spreading the concept of respectability, in the cities the physician was replacing the influence of the Catholic priest or Protestant

minister as the guardian of morality. The admiration for scientific advancement placed the scientist in higher public esteem than the theologian. The physician, as a scientist, promoted social norms that were considered healthy. Anyone who stood outside these norms or attempted to challenge them was considered 'sick'. Science became the new means by which to make moral judgments (Burd, 1936b; Mosse, 1988).

The battle between science and romanticism played out in interesting ways. Romanticism made a deep impact in Germany and to a lesser extent in England, both industrialized by the end of the nineteenth century. German Romanticism was displayed in the worship of nature. Germans used nature as a symbol of the values of the nation, where the medieval craftsman living closest to his natural and national roots must inspire the modern working class. The English version was a total rebellion against the destruction of nature by industry. The balance between industrialism and romanticism played out in the acceptance of technology and the factory as necessary, but the power behind the change was seen as human beings themselves regenerated through nature and the nation. This ideology formed the basis of Fascism and National Socialism seen in the twentieth century, both of which were fascinated by modern technology (Mosse, 1988).

National pride, a new middle class, and Darwinian theory provided the drive for a positivist, scientific explanation of the world. Reality was defined in terms of matter. Materialism became a driving force for the working classes. At the same time, Germany became more powerful. With the expulsion of the French and the new acquisition of Alsace-Lorraine, Germany entered a time of industrial enterprise. Mines and factories sprouted up throughout Germany. The population grew from 41 million in 1871 to 65 million in 1914. Berlin grew from 800,000 to over two million. The word 'German'

became synonymous with the word 'efficient'. Germany flooded the world market with manufactured goods.

Germans created highly organized technical training schools, giving them an early lead in the production of electrical and optical goods. Everything about industry was organized. Business was regimented through the formation of cartels. Bismarck looked after the interests of workers through the creation of the first national system of social insurance. Industrialism came more slowly to France and to Russia, neither becoming serious industrial competitors until after World War I (Kirby, 1936).

ACT THREE

Scene 6

BILL: Good summary of nineteenth century life in Europe, Minerva. But if I remember right there was another undercurrent running through German culture.

MINERVA: You remember right, Bill. I think you are probably talking about Friedrich Nietzsche.

BILL: Yes – another madman in history who made a big influence.

ADAM: Is that the father of the Nietzschean race on Andromeda (*haha*)...(*looks around*)...sorry, just kidding.

MINERVA: Actually Adam, you're right on target.

ADAM: I am?

MINERVA: Describe the Nietzschean race.

ADAM: They're really cool – they are super humans. They are stronger and smarter than any other humanoid race in the universe.

MINERVA: Well, there you go. Friedrich Nietzsche believed that the human race could eventually develop into Overmen or Supermen. He believed that we would one day blend the best of barbarism with the best of intellect to create a super race that would one day look back on current humanity with disdain. As he put it, much like we look at the difference between ape and man.

ADAM: You're kidding. You mean Gene Roddenberry knew philosophy?

MINERVA: Apparently. Because he only added two letters to Nietzsche's name to create the new super-race of the universe in his show. Why go through all the work of creating new science fiction when you can pull from our own history? Existing philosophy can sometimes play off as the most futuristic science fiction. And people are already introduced to a concept that is easily acceptable.

ADAM: Huh! So tell me about this guy Nietzsche.

MINERVA: He made a bigger impact on the twentieth century than the nineteenth. But let's start at the beginning...

A Turn in German Philosophy at the Turn of the Century

The ideas of the brilliant and demented German philosopher Friedrich Wilhelm Nietzsche (1844-1900) were taken up with interest in the twentieth century. Although he died in 1900, his influence on modern thinking is still present. He is now counted among some of the most influential thinkers of modern times. He published several works, the most noted being *The Birth of Tragedy* (1872), *Joyful Wisdom* (1882), *Thus Spake Zarathustra* (1883-1885), *Beyond Good and Evil* (1886), and the *Genealogy of Morals* (1887).

Nietzsche was born in 1844 in Prussia into a strongly religious family. His father, a Lutheran minister, died four years later, having been consumed by mental illness. After being raised a Lutheran by his pious mother and aunts, Nietzsche experienced a sense of liberation when he encountered Arthur Schopenhauer's atheism while studying at the University of Leipzig in 1865. From that time forward Nietzsche presented himself as an opponent of Christian dogma and the personality of Jesus. As a result, Nietzsche was also vehemently opposed to all the ideals of industrial morality based on Christian ethos. He argued against Christianity, democracy, and the accepted norms of morality. He considered Christianity a debasement of the human ideal. He declared that 'God is dead' and that religious belief was no longer possible for an intelligent human being. He was convinced that art was the highest form of human activity. His own version of philosophy is more artistic in expression than systematic.

At the age of twenty-four Nietzsche was appointed to a Chair of philology at Basel. His first book, *The Birth of Tragedy from the Spirit of Music* (1872), presented a contrast between two aspects of the Greek psyche: the wild, barbarous and irrational passions of Dionysus, and the disciplined harmonious nature of Apollo. He claimed that the greatness of Greek culture lay in the synthesis of the two. Socrates, with his focus on rationalism, disrupted the balance that effectively destroyed the art of Greek tragedy. He claimed that contemporary Germany could only be saved from the decadence that overtook Greece through the music of Richard Wagner (Kenny 1998; Kaufman, 1992; Nietzsche, 1992a/1886; Seymour-Smith, 1998).

By 1876 Nietzsche appeared to change his focus on art and lost his admiration for Schopenhauer. *In Human, all too Human* (1878) Nietzsche seemed sympathetic to

utilitarian values and appeared to value science above art. This too was a phase in Nietzsche's development, for he immediately began a series of works affirming the value of Life and denouncing those things he felt were hostile to Life, including scientific positivism. By 1889 he began to show signs of the madness that had consumed his father, living in senile retirement under the care of his family until his death in 1900.

Nietzsche's writing is obscure enough to be open to many interpretations. In his lifetime he wrote articles to clarify the meanings of earlier works. He has often been wrongly accused of being the progenitor of Nazi-ism. In fact, Nietzsche was against the Germans of his time, especially the type that would later become Nazi. His description of the 'Overman' (Übermensch) that Hitler adopted as the blond, perfected Aryan race was a misappropriation. Nietzsche abhorred what he called 'herd mentality' and would likely have objected to Hitler's manipulation of the masses. His version of the 'Overman' or Superman, was the state that an individual reaches upon total moral development, regardless of race. Yet, in reading Nietzsche it is possible to see how his meaning could be contorted to justify the behavior of a 'superior race'. In *Thus Spoke Zarathustra*, Nietzsche states

What is the ape to men? A laughing-stock or a painful embarrassment.
And just so shall man be to the superman: a laughing-stock or a painful embarrassment.

You have made your way from worm to man, and much in you is still worm. Once you were apes, and even now man is more of an ape than any ape.

But he who is the wisest among you, he also is only a discord and hybrid of plant and of ghost. But do I bid you become ghosts or plants?

Behold, I teach you the superman.

The superman is the meaning of the earth. Yet you will say: the superman *shall be* the meaning of the earth!...

Man is a rope, fastened between animal and superman – a rope over an abyss.

A dangerous going-across, a dangerous wayfaring, a dangerous looking-back, a dangerous shuddering and staying will.

What is great in man is that he is a bridge and not a goal; what can be loved in man is that he is a *going-across* and a *down-going* (Nietzsche, 1977/1883, pp. 238-239).

Humanity is merely a stage on the way to Superman. But Superman is not achieved by means of evolution; it is achieved as an exercise of will. He encouraged the human race to exercise the strength of will to transform itself into the forefathers and ancestors of the Superman (Kenny, 1998; Nietzsche, 1977/1883; Nietzsche, 1992a/1886; Seymour-Smith, 1998).

Nietzsche also expressed doubt about the validity of certainties (such as the Cartesian 'I think'). In doubting their value, he also questioned the value of all previous knowledge in understanding the nature of human knowledge; he claimed that knowledge is actually nothing more than familiarity. He never actually proposed any type of a theory of knowledge; instead he offered philosophy as a means of legislation of knowledge – in his opinion, philosophy does not say what reality is, but seeks to control it by interpreting it. He believed that science was no closer to explaining reality than philosophy.

According to Nietzsche

It is perhaps just dawning on five or six minds that physics too is only an interpretation and arrangement of the world...and *not* an explanation of the world: but insofar as it is founded on belief in the senses it passes for more than that and must continue to do so for a long time to come. It has the eyes and ears on its side, it has ocular evidence and palpability on its side: and this has the effect of fascinating, persuading, *convincing* an age with fundamentally plebeian tastes (Nietzsche, 1977/1886, p. 64).

Nietzsche held that truth was simply a matter of perception, of images. He proclaimed that 'God is dead' and that humans could not improve their situation through a vain search for security in the creation of gods. Nietzsche targeted contemporary society; many of his writings were focused on the destruction of what he believed were society's self-deceptions. In his version of reality, man is chaotic and lives in a chaotic universe. Mastering this reality requires man to detach himself from the preconceptions of society, and indeed from society itself.

Nietzsche accused society of promoting ideas that were harmful to men. He accused society of adopting a slave morality, in which individuals were taught to lead a socially useful life and to serve society. He claimed that Christianity led to slave morality and promoted the concept of human equality. Christianity, therefore, was a forerunner of democracy, and had buried the individual man within the masses, thereby defeating man's attempt to deal with the chaos of life. Nietzsche rejected Christianity in favor of classical tradition as the true path for modern man's salvation. The barbarian was the key to this tradition – the true transformer of values. The barbarian totally rejects the values of society and creates his own. Like Rousseau, Nietzsche claimed that if man started out free of the corrupted beliefs of society, he would be able to create a reality that was above the dichotomy of good and evil as understood by Christian society. Like Darwin, Nietzsche believed that life is a universal and invisible force. In order to cope with the world, man must abandon himself to this force, releasing himself to all of its positive passions – pride, joy, health, sexual love, enmity, and war. In order to accomplish this man needed the 'will to power', which reinforced man's will to life.

Nietzsche described the will to power as the essence of life, “the spontaneous, aggressive, expansive, form-giving forces that give new interpretations and directions” (Nietzsche 1992b, p. 515). He accused Christianity of creating a herd mentality that robbed man of his life force. But even scientific conjectures were not immune to his criticism. He accused Herbert Spencer of developing a theory that moved adaption to the forefront, an activity he believed to be of the second rank, a mere reaction, in front of the primary life giving forces. He agreed with Thomas Huxley that Spencer’s theory of ‘survival of the fittest’, or the inner adaption to external conditions, was merely a form of ‘administrative nihilism’ (Nietzsche, 1992b).

Nietzsche accused science of becoming a “*hiding place* for every kind of discontent, disbelief, gnawing worm, *despectio sui*, bad conscience – it is the unrest of the lack of ideals, the suffering from the lack of any great love, the discontent in the face of involuntary contentment” (Nietzsche, 1992b, p. 583). Science, in his opinion, had become as much a sedative to society as Christianity. He accused men and women of science of holding a faith that was as deep and committed as any Christian; a faith in which they were “its most spiritualized product, its most advanced front-line troops and scouts... They are far from being *free* spirits: *for they still have faith in truth*” (p. 586). And Nietzsche considered truth to be an illusion, a concept conjured out of the minds of men – the world can always be interpreted differently depending on one’s perspective. As far as Nietzsche was concerned science could not operate separate of its faith in truth, he stated that

Strictly speaking, there is no such thing as science ‘without presuppositions’...a philosophy, a ‘faith’ must always be there first of all, so that science can acquire from it a direction, a meaning, a limit, a method, a *right* to exist...Science itself henceforth *requires*

justification...the ascetic ideal has hitherto *dominated* all philosophy, because truth was posited as being, as God, as the highest court of appeal – because truth was not *permitted* to be a problem at all...From the moment faith in the God of the ascetic ideal is denied, *a new problem arises*: that of the *value* of truth...This pair, science and the ascetic ideal, both rest on the same foundation – I have already indicated it: on the same overestimation of truth (more exactly: on the same belief that truth is inestimable and cannot be criticized). Therefore they are *necessarily* allies, so that if they are to be fought they can only be fought and called in question together. A deprecation of the ascetic ideal unavoidably involves a depreciation of science: one must keep one's eyes and ears open to this fact! (pp. 588-589).

Nietzsche accused science of being as damaging to the human spirit as religion. Science, in his estimation, also corrupted the barbaric spirit that was the essence of life.

Simplified, Nietzsche's philosophy reflected a struggle between two groups, those who express the 'will to power' and those that comprise the democratic masses who adopted a herd mentality based on their faith in religion and science. Nietzsche described those with the 'will to power' as 'Aryans', men of prey who were rich in life, strong, and in possession of an unbroken strength of will and a lust for power. He claimed these Aryans were the source of all civilization because they conquered and destroyed the weaker, more civilized, peaceful races that corrupt society.

Nietzsche's sister, Elisabeth Forster-Nietzsche was a committed believer in the superiority of the German race, and an ardent enthusiast of her brother's philosophy. She and her husband Bernard Forster were both members of a circle of intellectuals who conceived of a plan to set up a colony of Aryan German settlers in Paraguay in 1877. Their goal was to recolonize the New World with 'racially pure Nordic pioneers'. Their plans failed, her husband Bernard committed suicide, and Elisabeth returned to Germany. Upon her return she began promoting her brother's philosophy. She cared for him during his last years of life, during which time he was insane, and forced her mother to sign over

legal control of his affairs. She then wrote a two-volume biography of Friedrich and turned his home into a shrine. She became an avid supporter of Hitler and gave him Friedrich's walking stick as a symbolic gesture of his succession in carrying on the Aryan ideal (Mosse, 1974; Watson, 2001).

ADAM: I know enough history to know that Hitler played Nietzsche's philosophy to the hilt.

BILL: Now you know why an understanding of your philosophy is important. It is the foundation of the belief system that we use to justify all of our actions.

ADAM: No kidding...I'm going to have to give this some serious thought.

ACT THREE

Scene 7

MINERVA: Changes in philosophy weren't restricted to Europe. The US was going through its own changes. But the separation of the US from the rest of continental Europe resulted in a very different philosophy. The American landscape fostered a sense of independence that had long ago faded in Europe and England.

TONI: Just the sheer size of the country and the isolation of communities from one another caused us to become more independent. It's a wonder we managed to hold together as one nation.

MINERVA: And those factors did distract the people of America from actively engaging in philosophic dialogue and reflection...

American Transcendentalism and Abolitionism

The first half of the nineteenth century was a time of rapid change in the American landscape and American culture. The United States entered a period of rapid expansion in the nineteenth century. The 1800 census claimed a population of 5,308,433 people, of which nearly one fifth were black slaves. Except for two wagon roads into the interior, the land was relatively untamed. More than two thirds of the population lived along the seaboard within fifty miles of the coast. The center of population hovered within eighteen miles of Baltimore, Maryland. Only four to five hundred thousand people had moved west of the country beyond the Alleghenies. One of the wagon roads led from Philadelphia to Pittsburgh where seventy to eighty thousand people lived. Settlements along the Ohio River in Kentucky housed one hundred and eighty thousand whites, and some forty thousand black slaves, making Kentucky the largest community west of the Allegheny Mountains. In Tennessee ninety thousand whites and fourteen thousand slaves had settled in the wilderness. Smaller pockets of civilization were scattered throughout the Ohio territory; the whole Ohio territory contained only forty-five thousand inhabitants.

Travel between centers of population was difficult and time-consuming. As in Europe, waterways were important conduits of trade and transportation. Uninhabited areas separated each state and frontier settlement. The distance between inhabited areas created a challenge in creation of the Union. The problems of bringing together New England with the southern states were not resolved even with the aid of direct ocean travel. Each group of States lived a life apart from England and from one another.

Even populated centers struggled. The 1800 census showed twenty-five thousand inhabitants in Boston. In appearance, Boston was similar to an English market town. The streets and sidewalks were paved with round cobblestones. The streets were unlighted, there was no paid police force, and the system of taxation was defective. Although other areas along the eastern seaboard were beginning to flourish, Boston and New England were still poor. A few merchants earned an income in foreign trade, but most lived a meager existence.

Life for inhabitants in the New England States was similar to those in Boston. Of all parts of the Union, Philadelphia and Baltimore seemed to have prospered more than most. The census of 1800 showed that Pennsylvania was home to seventy thousand people. Repeated bouts with yellow fever roused an interest in sanitary precautions and cleanliness. The city was well paved and partly drained. Water was supplied in wooden pipes; streets were lighted; the marketplace clean and bright. Philadelphia was the seat of government until July 1800, housed the Bank of the United States, and boasted industry in iron-works and the production of paper, gunpowder, pleasure carriages, and many other manufactured goods. Public spirit was active in Philadelphia and spread through the state of Pennsylvania. Roads and canals were built across the state; the highway from Philadelphia to Pittsburgh increased the ability of Pennsylvania to compete in the foreign export business.

Farther south, the city of Washington, built along the Potomac, was the symbol of American nationality in the Southern States. In July of 1800, the seat of government was transferred from Pennsylvania to the White House in Washington along the Potomac River. At the time of the move, the White House and the Capitol were only half-finished.

Congressmen and the President lived in boarding houses and a few isolated dwellings within sight of the White House. The seat of government was located in an isolated section of the country, apart from the benefits of civilization, and in an area with no commerce to support a merchant community. The parsimony with which Congress doled out funds for the national project was astounding. It was as if the government was proud of its struggle with nature to carve out a new nation.

As one traveled farther south, there was little in the way of civilization. There were no centers of manufacturing. Virginia, the most populous and powerful of the Southern States, had a white population of 514,000 and about 350,000 slaves. The farming of lands had created a western push as soils were depleted and abandoned to the cultivation of new land. The land in Virginia was no longer very productive. Years of cultivation growing tobacco had depleted the soil. The great planters sought in vain to improve their crops and their stock.

North and South Carolina, south of Virginia, were sparsely inhabited. Prior to 1800 North Carolina was the poorest of the States. By 1800 the insurgence of the weaving industry provided impetus for the production of cotton, to which the fresh soils in the Carolinas were aptly suited. The town of Charleston, South Carolina became a major exporter of cotton. In 1791 Charleston exported two hundred thousand pounds of cotton; by 1801 the amount had grown to more than twenty million pounds and doubled again by 1803. Charleston held a promise of great wealth. The society of Charleston was educated, wealthy by standards of the day, and intelligent. By 1800 Charleston was nearly finished with a canal that would bring the Santee River to its harbor and was planning a road to Tennessee, which would bring the entire interior within its reach.

Nashville was closer to Charleston than to any other seaport. The advantages of South Carolina were counterbalanced by the climate and the slave society that was developing. The summers were too hot; the slave population, counting nearly one hundred thousand, outnumbered the white population, counting some thirty thousand. The cotton states were plagued with summer heat, malaria, and slavery. Following the War of 1812 the question of slavery became a deciding factor in the relations between Northern and Southern society. The egalitarian nature of the new Union was at odds with the values of the slave society that developed in the South (Adams, 1973/1889).

American philosophic thought was stagnant in the period of time between the War for Independence and the War of 1812. Americans during this period turned their attention toward the formation of the national government, entrance into the world economy in the age of machinery, and the exploration of new territory. The War of 1812 marked a change in American thinking. The war greatly increased the national feeling within the United States and started the manufacture of new products that had previously been imported. In effect, the United States took its place among the great nations of the world. In the thirty years of peace that followed the War of 1812 the nation turned its interest toward internal policy, internal improvements such as the building of national roads, canals, and railroads, the expansion of public lands, education, and slavery. There was also a rise in interest in American society as a whole. Americans became interested in a search for bonds of social, economic, intellectual and spiritual unity that crossed state, regional, and class boundaries. Historian George Bancroft, in an address before the New York Historical Society in 1854, stated that

The exact measure of the progress of civilization is the degree in which the intelligence of the common mind has prevailed over wealth and brute

force; in other words, the measure of the progress of civilization is the progress of the people (as cited in Beard & Beard, 1944, p. 226).

The American public was engaged in the advance of the American civilization. The reading public was enlarged by both popular and secular education. The eight daily newspapers of 1790 grew to 387 by 1860. The invention of the rotary press and the telegraph made possible large circulation and rapid transmission of news. Publishers of books, magazines, and newspapers reached out for patronage. There was a widening market for essays, articles, and books written in a popular style and dealing with every theme of human interest – economic, scientific, political, historical, social, religious, and philosophical (Beard & Beard, 1944; Smelser, Kirwin, Hoffman, Fabian, 1962; Thomas, 1908).

As the public became wider read, a new venue opened to support the dissemination of ideas. Public speakers took to the platform. A Lyceum Lecture Bureau was organized to provide speakers on various topics to clubs and societies on a circuit that ranged from the seaboard to the frontier. In Lyceum lecture rooms, thousands of Americans were exposed to new letters, art, science, and issues of the times. Mass meetings came into vogue as a means to promote ideas and innovations. In the early days of this movement, unruly attendees hissed, booed, and often stoned orators who challenged traditional theories and practices. Against opposition and disorder, the platform grew in influence and the attendees became more disciplined. Public speaking became a practice of increasing importance in the movement for social reform and in the formation of public opinion (Beard & Beard, 1944).

The increasing interest in social issues also encouraged the development of literature based on American subjects. Before the nineteenth century, American literature

was influenced by what was being written in Europe. After the War of 1812 Americans started to drop European ways of thinking and acting. The character of the typical American diverged greatly from his European counterpart. Gradually, this new character was reflected in the country's literature. American authors turned to native American subjects for material. Washington Irving (1783-1859) wrote his *Sketch Book*, which included the stories of "Rip Van Winkle" and "The Legend of Sleepy Hollow". One of Irving's later works, *The Adventures of Captain Bonneville*, was based on the true-life experiences of Benjamin Bonneville in his explorations of the west. James Fenimore Cooper wrote *The Last of the Mohicans*, the first story about Indians and pioneers. Edgar Allen Poe invented the modern detective story, writing masterpieces of terror. He helped to popularize the short story, which grew as a form of literature with the growth of magazines in America.

New England, with its colonial heritage and its many schools and colleges became the center of literary activity in the United States. New England produced two great novelists: Nathaniel Hawthorne and Herman Melville. Hawthorne was deeply concerned with the consequences of sin and guilt, which he reflected in his most famous book *The Scarlet Letter*. His novel *The House of Seven Gables* is the story of a curse in the family of a man involved in the early witchcraft trials in Massachusetts. Hawthorne's friend, Herman Melville, wrote of adventures at sea. Melville's books were initially quite popular. His popularity decreased however, and his most famous book *Moby Dick* sold badly in his lifetime and was not rediscovered until 1920.

Nineteenth century New England was noted for its poets. Ralph Waldo Emerson, Henry David Thoreau, Henry Wadsworth Longfellow, John Greenleaf Whittier, James

Russell Lowell, and Dr. Oliver Wendell Holmes were all New Englanders. Longfellow's poems were sentimental and displayed human nature. In "The Courtship of Miles Standish" Longfellow portrayed the beauty and human side of Pilgrim life. In "Hiawatha" Longfellow retold Indian legends and helped Americans appreciate the Indian way of life. Lowell and Whittier were both reformers. Whittier's poetry shared the life and natural beauty of New England. He also wrote many poems against slavery. James Russell Lowell opposed the Mexican War because it would add more slave territory. He wrote a series of poems titled *The Bigelow Papers* in which he urged northerners to abstain from enlisting in the Army (Harlow and Noyes, 1961).

New England also gave birth to the transcendentalists. Transcendentalism is a word used by Ralph Waldo Emerson and his pupil Henry David Thoreau to describe their philosophy. Simply stated, it was a belief that man is the center of the universe and has a direct kinship with nature. Man's mind is capable of transcending human experience in order to reach God. Therefore, in order to live a good and bountiful life man should live close to nature, be independent, and trust his own intelligence for moral guidance. They sought to transcend the purely rational and cold calculating thought associated with technology and industry.

Emerson worked out most of his ideas in the course of his public lectures. In his essays, such as "Self-Reliance" and "Compensation", he taught the transcendentalist doctrine that man must be free and independent in spirit, and in close commune with nature. In his 1836 essay "Nature" he conceived nature as

a remoter and inferior incarnation of God...in the woods, we return to reason and faith. There...all mean egotism vanishes. I become a transparent eyeball; I am nothing; I see all; the currents of the Universal

Being circulate through me; I am part or parcel of God (as cited in Maier, Smith, Keyssar and Kevles, 2003, p. 411).

To be a Transcendentalist meant being partly a mystic, a worshiper of nature, and a believer in one's ability to understand the inner essence of things.

Initially, Emerson believed that machinery and transcendentalism were in agreement, and that technological progress might lead to human progress. Over time, Emerson's views changed and he became concerned about the negative implications of machinery and technology. By 1857 he openly questioned what technology had done for mankind and answered that material power and moral progress had not kept apace (Maier, Smith, Keyssar, & Kevles, 2003).

Emerson was a moralist who questioned the intent of moralism. He was a preacher who told people not to listen to preachers. He claimed a spirituality that was independent of the organized church. He renounced Christianity in favor of personal revelation. In a sermon in 1832 Emerson announced his disbelief in a supernatural Jesus and claimed that Copernican astronomy made the theological scheme of redemption incredible (Menand, 2001).

Emerson's student and friend, Henry David Thoreau, practiced what Emerson preached. He tried to live independent of money, possessions, and progress. In 1845 Thoreau moved into the woods at Walden Pond near Concord, Massachusetts. He lived there for two years during which time he wrote about his life in the woods. His book, *Walden* (1854), became one of the most important works in American literature. In *Walden* Thoreau accused his neighbors in Concord of living lives of quiet desperation connected with trade and factory work. He lamented that men had become tools of their tools. His problem was not with technology, but with the uses to which it was being put.

Unlike the nations leading artists and writers, the newspaper editors, journalists, and other popular writers openly celebrated the new age of machinery and the inventive genius that made it possible. Writers sought to immortalize the nation's inventors. Invention was associated with the 'mechanical arts' and inventors were placed on the same plane as the country's other artists (Maier, Smith, Keyssar, & Kevles, 2003).

Dr. Oliver Wendell Holmes wrote hundreds of verses and three novels and many people credited him with exceptional oratory skill. He became famous in 1830, the year after his graduation from Harvard, when he wrote a popular poem protesting the dismantling of the U.S.S. *Constitution*. After college he attempted to study law, but quickly switched to medicine. He studied in Paris, and in 1843 he published a paper on the causes of puerperal, which was a landmark paper on the germ theory of disease. In his controversial paper, he demonstrated that the attending physician carried the disease from childbirth to childbirth. He joined the faculty of the Harvard Medical School and later served as dean. He was one of the first members of the Saturday Club. The Club was a literary dining and conversation society whose participants included Emerson, Hawthorne, Longfellow, Richard Henry Dana, Jr., James Russell Lowell, and Charles Eliot Norton.

Dr. Holmes was also a founder of the *Atlantic Monthly* (1857), the name he invented and in which he published his popular column: "The Autocrat of the Breakfast-Table" (followed by "The Professor at the Breakfast-Table" and "The Poet at the Breakfast-Table"). Dr. Holmes' chief ambition was to represent the Boston point of view on all things. He considered Boston the center of American thought. He was an enemy of Calvinism and a rationalist. He was neither opposed to slavery or a fan. He disavowed the

opposition of the abolitionists while supporting opportunities for blacks. He considered the abolitionist views to be in opposition to the good of the Union. Abolitionists preached a message calling for the end of slavery at any cost. They despised the unionists as people who put self-interests ahead of righteousness. Abolitionists accused unionists of being greedy hypocrites. Unionists accused abolitionists of goading the South into secession. The north itself was divided long before the war between North and South (Maier, Smith, Keyssar, & Kevles, 2003; Menand, 2001).

Abolitionism arose out of the evangelical revival that swept through New England and upstate New York between 1800 and 1840. Known as the Second Great Awakening, the revival spawned a social reform movement that included abolitionism, women's rights, and a number of utopian and religious sects, most notable the Mormons. The foundation of the abolitionist movement was spiritual and anti-institutional. Abolitionism was a party for people who did not believe in institutions, ideally suited to attract Unitarians, Transcendentalists, and the generally post-Calvinist culture of New England.

Literature was used as a weapon of reform. Harriet Beecher Stow wrote *Uncle Tom's Cabin* in 1852 as an attack on the evils of slavery. Southerners hated the caricature it made of their culture. Northerners believed the image it portrayed. Emerson praised it as speaking to the universal heart. It sold over a million copies in one year. Her book was quickly made into a play and was carried by road shows to all parts of the country. It played almost continuously some place or other until well into the 1920s. Her book played a large part in arousing the people of the North against slavery.

William Lloyd Garrison was a supporter of abolitionist beliefs. Garrison was a pacifist who believed that no abolitionist should hold office. He, like other abolitionists,

believed that any system that allowed slavery was evil. He used his newspaper, the *Liberator*, as a vehicle for reform. Week after week from January 1, 1831 until 1861, Garrison denounced slavery and demanded abolition. At one point he printed “The United States Constitution is a covenant with death and agreement with hell” on the front page of the newspaper. He claimed that the Constitution was a violation of the Declaration of Independence, which asserts that people have a natural right to resist the state for reasons of conscience. Radical abolitionists did not believe in reform through political process, but through conversion, a change in the moral vision of the people. Abolitionist contempt for ordinary politics made them enemies of even their antislavery allies. In 1835 some Bostonian unionists seized Garrison and dragged him through the streets with a rope. He was rescued by the mayor, who put him in jail for safekeeping (Harlow & Noyes, 1961; Menand, 2001; Smelser, Kirwin, Hoffman, & Fabian, 1962).

Garrison’s associate Wendell Phillips joined the cause of abolition as a young man. Phillip’s father was mayor of Boston. Like his father, Phillips pursued law, but gave it up in 1837 after an abolitionist printer named Elijah Lovejoy was shot and killed by a unionist mob in Illinois. Following the murder, the attorney general of Massachusetts, James T. Austin delivered an address in which he defended Lovejoy’s killers and compared them to the patriots who participated in the Boston Tea Party. Phillips stood up in the audience and denounced Austin; his speech of denunciation was enthusiastically received, launching his career as an abolitionist. His family thought he had lost his mind and considered putting him in an asylum. Wendell Phillips was unlike other abolitionists, many of who opposed the evils of slavery while still holding the belief that whites were superior to blacks. Phillips was outspoken on the social equality of blacks and women.

Newspapers ridiculed his racial and sexual egalitarianism. Although he refused to participate in politics, he well understood the power of agitation. He made the degree of outrage he aroused in his opponents as the measure of his success.

Wendell Phillips was a cousin of Dr. Holmes. As a Unionist, Holmes was a staunch supporter of pro-slavery congressman Daniel Webster and was one of the signatories on a public letter to Webster congratulating him on his Seventh of March speech in 1850. In his speech Webster turned against the abolitionists and supported all of the Compromise of 1850 in which slavery was banned in California and Washington D.C., put to vote in Utah and New Mexico, settled the debts of Texas, and more importantly permitted the passage of a new fugitive-slave law. Webster agreed that a strict fugitive-slave law was necessary and begged Americans to compromise to save the Union. Abolitionists called Webster a traitor. Holmes, for one, praised him for his courage in working to save the Union.

The debate over slavery became a consuming topic. The Fugitive Slave Act took the responsibility for runaway slaves away from local officials and turned it over to federal judges. U.S. Marshalls were responsible for tracking down and returning runaway slaves. Abolitionists hated the law and worked aggressively to prevent it from being enforced. In 1855 Dr. Holmes, in a lecture in New York City, attacked the abolitionists and expounded on the natural superiority of the white race. His remarks were reported in the press. He was criticized in Horace Greeley's *New York Tribune*; the *Boston Advertiser*, a Unionist paper, favored Holmes and reported that he called the abolitionists 'traitors to the union'. These reports upset a number of Holmes's literary acquaintances, particularly Ralph Waldo Emerson.

When Dr. Holmes learned of Emerson's displeasure over the reports of his attack on abolitionists, he wrote a letter to Emerson explaining that the press had misrepresented him. Emerson, who had been slow to accept the abolitionist cause, had come to support their stand. He typically distrusted anything collective and foreign to his own experience. In the beginning he saw no difference between abolitionism and institutionalized religion, both of which discouraged people from thinking for themselves. So, from the beginning of his career he had steered clear of the subject of slavery. As his consciousness of the evils of the Southern slave industry grew, so grew his identification with abolitionist views. He was disturbed by the murder of Lovejoy in 1837, though at the time he considered the attack to be an issue of free speech rather than slavery. He came to see the collective institution of slavery as far more evil than the collective that opposed it. He thought Webster, who he had admired, had sold his soul for the sake of compromise. He pronounced the Fugitive Slave Law a filthy law. Despite their disagreement about abolitionists, he and Emerson continued friendly relations. In fact, Emerson made a profound impact on Holmes son, Oliver Wendell Holmes, Jr. (1841- 1935).

In 1858 Dr. Holmes gave his son five volumes of Emerson's writings. Nine months later the seventeen-year-old Holmes published an essay in the *Harvard Magazine* titled "Books." Holmes essay was a tribute to Emerson. In his essay Holmes remarked that Christians have yet to learn the lessons of love and forbearance. He asked 'Do men own other men by God's law?' The young Holmes, in opposition to his father, adopted the language of Emersonian abolitionism. He associated the tolerance of slavery with conformist mentality. He was highly sensitive to cruelty and inherited none of his father's racial prejudice. He disliked minstrel shows because they demeaned black people. He

believed that a scientific view of the world was not incompatible with moral beliefs, and that one could develop a better morality outside organized religion than within it.

Young Holmes became one of the editors of the *Harvard Magazine*; the magazine ran articles supporting abolition, the admission of women to Harvard, and curricular reform. In 1861 the magazine printed an editorial by one of Holmes's classmates, Wendell Phillips Garrison, the son of William Lloyd Garrison, attacking a retiring professor of religion at Harvard and demanding free will in matters of religion. By the winter of 1860-61, Holmes senior year at Harvard, the political battle over slavery was reaching a crescendo. After the election of Abraham Lincoln in 1860, the split between North and South began in earnest. Southerners began canceling orders for Northern goods. Wages were cut. The abolitionists continued to call for partition and angry Unionist mobs gathered to threaten them. Unionists attempted to kidnap Wendell Phillips who continued to deliver inflammatory abolitionist speeches. He argued that if the Southern states wished to secede then so be it – the North should let them go. Nineteen-year-old Oliver Wendell Holmes, Jr. volunteered to serve as a bodyguard, thereby aligning him with the most radical abolitionist in the country (Menand, 2001).

ACT THREE

Scene 8

MINERVA: The division in philosophy created a rift in the nation. One side arguing against, and one for, the continuation of slavery.

GEORGE: But it sounds like ultimately a common basis of philosophy also held the country together.

ADAM: Yeah, but with a lot of antagonism.

LINDA: Wars in Europe seemed to make a big impact on the population. It must be terrible to see the bloodshed in your own country. I assume the same was true for the US.

MINERVA: You're right, Linda. It affected the spirit and the landscape of America. In the search for meaning in life after the war, Americans were also susceptible to European philosophy. Some of the thinking was imported, the rest of it was created out of the war experience...

The Impact of the American Civil War

On April 12, 1861 Southern batteries opened fire on Fort Sumter in Charleston harbor. In one stroke, the South accomplished what no Northerner had been capable of – it unified the North. The advent of war was accepted throughout the North. Abolitionists switched from pacifism to militarism. Quakers rushed to enlist. Unionists, like Dr. Holmes, became abolitionists and advocates of war against the South. Fort Sumter surrendered on April 14. On the 15th Lincoln called for volunteers. By the 25th Wendell Holmes dropped out of Harvard to enlist. He returned to Harvard in June to take his final examinations. He graduated with his class on July 17, 1861. On July 23 he was commissioned, along with his friend and classmate Pen Hallowell, as an officer in the Twentieth Regiment of Massachusetts Volunteers.

Holmes accepted his commission in a spirit of moral obligation. His first battle, at Ball's Bluff on October 21, 1861 was a shock to his sensibilities. The battle was horrific and the fighting intense. Of the 1,700 Union soldiers who entered the battle, only 800

survived. Holmes was among the wounded, having taken a bullet just above the heart. He was dragged from the field, carried across the river, and placed in a house being used for a hospital, where he was informed that he might die. He was transported that night to a regimental hospital. He witnessed death on the battlefield, followed by suffering and death in the hospital. He used his experiences to test his beliefs. He examined his philosophical convictions and documented his reflections in a journal. It was during the war years that Holmes formed his conception of the nature of views. It was the great lesson he thought the war had taught him – that the mind adjusts itself to its reality and that the test of a belief is not immutability, but adaptability.

Holmes recovered and returned to duty. On September 17, 1862 he was shot in the neck at the battle of Antietam, where the Union lost thirteen thousand men. Holmes returned home to Boston to recover from his wound, returning to the battlefield in November. At the battle of Antietam more Americans were killed than in all the other nineteenth-century American wars combined. Then in December, close to another 13,000 Union soldiers and 5,000 Confederate soldiers were killed at Fredricksburg. Holmes missed the battle at Fredricksburg because he was sick with dysentery, a battlefield disease that was often fatal (it killed more than 44,000 men during the war). Holmes grieved his inability to lead his men. His friend Henry Abbott led two advances in Fredricksburg, both of which were halted by enemy fire, killing most of his men. The spectacle of the battle confirmed Holmes's conviction that war was a hideous waste of human life.

In May 1863 Holmes was injured once again, shot in the foot during an engagement known as the Second Fredricksburg. He returned to Boston to recover, this

time staying home for nine months. He returned to action in January 1864 and was transferred to a staff position in the Sixth Corps. He was transferred to the general staff because there were not enough soldiers left in his regiment. His regiment participated in some of the bloodiest fighting – only four regiments suffered a higher number of battle deaths. Holmes had witnessed some of the greatest carnage of the war. He developed a great respect for the discipline of the military professional. He also remained committed to the cause of anti-slavery. Abolitionist sentiment increased among Northern troops after Gettysburg. For many Northerners, the final years of the Civil War became a moral crusade.

Holmes' last campaign was the battle of the Wilderness, a campaign fought over a forty-day period between May 5 and the end of June 1864. In the forty days, Grant lost sixty thousand men. Holmes was ready to resign. He was discharged in July and returned home to Boston. He had entered the war with a spirit of enthusiasm; he left the war convinced that soldiers who understood the mechanics of battle were better prepared and fought more valiantly than soldiers who were motivated by enthusiasm for a cause. By the time he finished his last campaign in the Wilderness, he was convinced that the emotion of a cause was only a feeling people used to destroy themselves.

Upon his return to Boston, Holmes went out to Concord to visit Emerson. He wanted to see if he was suited to a career as a philosopher. He concluded that he was not and enrolled at Harvard Law School. He did not, however, give up on the idea of doing philosophy. Like many men after the war, Holmes rejected the intellectual style of prewar Boston. He rejected the individualism, humanitarianism, and morals that characterized Northern intellectual life before the war. In its place, they adopted an attitude that implied

impersonality, respect for institutions as efficient organizers of enterprise, and a modern and scientific attitude. There was a common faith in science and a desire for stability.

In 1876 Holmes sent a letter to Emerson along with a copy of his first law review article, titled "Primitive Notions in Modern Law". Holmes was working as an attorney, but devoted his spare time to legal scholarship. He wrote to Emerson

It seems to me that I have learned, after a laborious and somewhat painful period of probation that the law opens a way to philosophy as well as anything else, if pursued far enough, and I hope to prove it before I die. Accept this little piece as written in that faith, and as a slight mark of the gratitude and respect I feel for you who more than anyone else first started the philosophical ferment in my mind (as cited in Menand, 2001, p. 59).

Holmes advocated disinterested inquiry as the best way to investigate and solve problems. He became a philosopher of professionalism or 'jobbism' as he called it. He believed that the pursuit of doing a job well created a practical altruism. His focus on the impersonal nature of professionalism may have been his attempt to deal with the horrors of war.

After the war, though well read, Holmes could not bear to read histories about the Civil War. He recalled fallen comrades with emotion, told the stories of battle, and alluded to his experience in battle in his writing and speeches. But he rarely mentioned the issues that led to the war and destroyed his diaries and family letters written during the war. He believed that conviction and certitude leads to violence. He believed that democracy was the only means to keep competing philosophies from leading to violence. In the seventy years that Holmes lived after the war, the primary struggle was between capital and labor. The majority of judicial opinions for which he became known during his time as a United States Supreme Court Justice (1902-1932) dealt with the struggle between capital and labor. He thought socialism a silly doctrine. He considered capitalists

to be the engines of social wealth. He thought only in terms of aggregate social forces with no concern for the individual.

For Holmes, the defense of civil liberties had nothing to do with the notion that those liberties were owed to people simply on the argument that they were human. He held such belief in contempt. He defended the rights of both socialists and pacifists to express their views on the basis that those views represented a legitimate social interest. Holmes was a consistent defender of economic reform and free speech. Although he never claimed it, he practiced a philosophy that became a pillar of American thought – pragmatism (Menand, 2001).

American Pragmatism

Pragmatism is a method of philosophizing developed in America in the late nineteenth century as a revolt against the philosophic traditions that existed in American Universities. Simply stated, pragmatism is not a system of *what* we think – it is a philosophy about *how* we think. Pragmatists such as Oliver Wendell Holmes, William James (1842-1910), Charles Sanders Peirce (1839-1914), John Fiske (1842-1901), Chauncey Wright, and John Dewey (1859-1952) felt that their method and theory offered a practical means to solve intellectual problems, to identify the kinds of knowledge we are capable of acquiring, and to promote social progress. James, Peirce, and Fiske are credited as the founders of pragmatism and along with others were involved in meetings of the Cambridge Metaphysical Club in the early 1870s. Through the course of their discussions and investigation, the three of them formulated pragmatic philosophy (Menand, 1997; Van Wesep, 1960).

Peirce was born in Cambridge, Massachusetts in 1839. His father, Benjamin Peirce, was a professor of mathematics and natural philosophy at Harvard. Peirce grew up in a home in which men such as Webster, Longfellow, Norton, Dr. Holmes and most of the Harvard science faculty were frequent visitors. Benjamin Peirce introduced all of his children to poetry, music, fine food, organized recitals, and family theatricals. He recognized in Charles a keen intelligence and gave his training special attention. They discussed complex mathematical problems and played games designed to hone his sense of concentration. Charles wrote a history of chemistry at age eleven, had his own laboratory at age twelve, and introduced himself to formal logic at age thirteen by reading his older brother's textbook. It is reported he could write with both hands simultaneously – a problem with the right hand and its solution with the left. His genius resulted in boredom with the level of instruction offered at Harvard. He graduated Harvard in 1859, ranking seventy-ninth in a class of ninety (Menand, 2001).

During his years at school he engaged in debates about philosophy with Chauncy Wright and Frank Abbot. He mastered Kant, having thoroughly read both editions of *Critique of Pure Reason*. After graduation he worked for the summer doing surveying in Louisiana, and then returned and took six months of study under Professor Agassiz to learn his method of classifying the sciences (Van Wesep, 1960).

Charles suffered from facial neuralgia and used opium, a commonly prescribed painkiller, for relief, apparently developing an addiction. During his time at school he also developed a reputation as a womanizer. His neuralgia and the drugs he used to alleviate the pain may have been the cause of his frequent fits of violent temper. In his senior year he described himself as vain, snobbish, uncivil, reckless, lazy, and ill

tempered. He knew he had a better nature, but knew that his personality was his enemy. His entire adult life was a cycle of self-indulgence and self-rebukes (Menand, 2001).

Following graduation, he went to work for the United States Coastal Survey, a government scientific agency as a means to escape conscription in the army. He remained an employee of the Survey for thirty years. In 1862 Charles married Harriet Melusina Fay, called Zina. Zina was a feminist, an outspoken opponent of immigration; she detested Irish-Americans, and was a flamboyant member of Boston society. However, in the view of Charles' family, Zina was a moderating influence who helped bring Charles to a serious state of mind.

In 1860 Charles entered the chemistry program at the Lawrence Scientific School at Harvard, where he met William James in 1861. He graduated with honors in 1863. In 1867 Benjamin Peirce was appointed as superintendent of the Coast Survey. He held the post until 1874. During those seven years, Charles and his father were closely associated. Peirce regarded his work as an extension of his father's work. Like his father he believed that whites were superior to blacks and that the institution of slavery was justified. He adapted the world-view of science before Darwin to post-Darwinian thought, meaning that he exchanged a view of certainty for one of uncertainty (Menand, 2001).

Peirce was interested in the impact of science upon philosophy; in the early seventies he formed the Metaphysical Club. From 1879 to 1884 he served as a Lecturer in Logic at Johns Hopkins University where John Dewey was a graduate student. The Metaphysical Club was a group of mature men, all with well developed thinking in regard to science and philosophy, who shared and challenged each others thinking. Attendees included Charles Sanders Peirce, William James, Oliver Wendell Holmes,

John Dewey, Joseph Warner, Nicholas St. John Green, John Fiske, and Chauncy Wright, and others. This was an eclectic group. Peirce was trained in science and mathematics, James, Fiske, and Wright in philosophy, Holmes and Warner were both attorneys, and Green a historian (and committed evolutionist).

Peirce wrote up the gist of some of the club discussions in the form of two articles, *The Fixation of Belief* (November, 1877), and *How to Make Our Ideas Clear* (January 1878), both published in the *Popular Science Monthly*. In the articles Peirce describes Chancey Wright, who attended all the meetings, as an ardent evolutionist. Wright personally visited Charles Darwin and claims to have received from him a specific assignment – the investigation along evolutionary lines of the origin of human self-consciousness. In April 1873 Wright published an article in the *North American Review* in which he explained that man might arrive at self-consciousness by putting old capacities to new uses. “Natural selection is not necessarily concerned in the first production of any form, structure, power, or habit, but only in perpetuating and improving those which have arisen from any cause whatever” (Wright, as cited in Van Wesep, 1960, p. 344).

Wright, like Peirce, stressed the gradual development of humans from animals. Unlike Peirce, Wright was not metaphysical and believed in the complete ethical neutrality of science; that nature is amoral. Wright was also a self-proclaimed nominalist. In this, the two men differed sharply (Van Wesep, 1960).

In 1878 Peirce developed a model, and coined the phrase *abduction* to explain the process that occurs when a hypothesis is formulated. In his view, a hypothesis cannot be formed without first considering how it would explain what needed to be explained.

Therefore, having formulated a hypothesis, its consequences should then be deduced, and then tested. The last step of testing involved induction. All three steps together, abduction (hypothesis formation), deduction, and induction (testing) constituted the scientific method (Oldroyd, 1986).

Peirce also applied the principles of pragmatism to truth claims, his primary area of interest. For Peirce, truth claims, or meaning, arise through language based only on the experience of individuals. In other words, one could not hypothesize about something that one had not had related experience. Credited as one of the founders of semiotics, Peirce conceived of the sign in three parts: a vehicle that conveys an idea to the mind (the representamen); another idea that interprets the sign (the interpretant); and an object for which the sign stands. According to Peirce, our experience and our cognition both play a role in interpreting signs. The fascinating outcome of Peircian semiotics was the introduction of relativism, which framed the modern world-view in the early twentieth century (Gottdiener, 1995).

One of the most famous members of the Cambridge Metaphysical Club was William James. James is responsible, in large part, for popularizing the notion of pragmatism. His success is as remarkable as Peirce's failure to succeed. James also grew up under the influence of men like Ralph Waldo Emerson, who was a good friend of his father, Henry James. Like Peirce, James did not fight in the Civil War. He was nineteen years old at the start of the war. Two of his younger brothers, Garth Wilkinson (Wilky) and Robertson (Bob) both enlisted and eventually served as officers in black regiments, the Fifty-Fourth and Fifty-Fifth Massachusetts. This is interesting in light of the fact that their father held a self-acclaimed belief in the natural inferiority of black people. When

Wilky was recovering from wounds incurred at the battle of Fort Wagner his father refused to believe his accounts of valor on the part of black soldiers.

It is assumed that their father prevented William (who is the oldest) and his third brother, Henry, from enlisting. Although William did not show an enthusiasm to enlist; later in life he expressed regret over his absence from the defining experience of his generation, placing responsibility for the decision on himself rather than his father. In 1861 he enrolled in the Lawrence Scientific School and spent the rest of the war as a student.

James' indecisiveness was a mark of his life. Just as he debated the question to enlist, he debated all decisions in his life. He worked most of his life to defend two simultaneously held world-views – modern science and religious faith – that to many at the time seemed to be mutually exclusive. He spent fifteen years in school debating between career choices, alternating switching from science to painting and back again, then to chemistry, anatomy, natural history, and finally medicine. He finally completed his study in medicine and received a M.D. from Harvard in 1869, and then never went on to practice or teach medicine. He spent the years from 1869-1872 ill and suffering from a depression that deepened his examination of the way people think. He traveled to Berlin, and while living alone went through a deep depression. He spent a great deal of time reading and in 1870, at the age of twenty-eight he laid claim to passing through a crisis in his life. He finished reading the first part of French philosopher Renouvier's *Second Essais*. Renouvier's emphasis on the will as a means of selecting what we want out of life had hit a chord for James. He never let go of his new-found conviction that will power is the means to create one's own reality. Gone were his days of dark depression and

hypochondriachal thinking. He never forgot his early struggles with the fatalism that was prevalent at the time. From Renouvier James learned two things: first, that philosophy is only a method of coping (not certainty), and second, that beliefs are true because of results, not logic.

In 1872 James started his career as a professor of physiology at the Harvard Medical School and then turned his attention to experimental psychology and philosophy, becoming a professor of philosophy at Harvard. It was during this time that James wrested control of psychology away from philosophers and placed it within the domain of the natural sciences. James opened the first experimental laboratory in psychology in the world, and taught the first class on physiological psychology in an American University (Emory University, 2004; Menand, 2001).

James developed a theory that the purpose of intellectual activity is to resolve difficulties that arise in the course of experience. James proposed the concept of identifying the 'cash-value' of a claim – identifying the function of the claim and what difference it would make if it were true. If a theory has no cash-value, then it would not make any difference if it were true or false and would not affect one's actions (Popkin & Stroll, 1993; Sedgewick, 2001).

James promoted the scientific method as a means to evaluate the truth of theories and rejected the view that truth exists separate of human experience. One consequence of pragmatic theory is that truth is relative to the situation. Truth is not something static and unchangeable; it grows and develops through time. James' theories formed the basis for the application of pragmatism to the logic of discovery, which was undertaken by Charles Saunders Peirce.

James often spoke of pragmatism as the equivalent of the Protestant Reformation. His intention for pragmatism was the creation of an argument in philosophy for discarding obsolete ideas, of breaking down old institutions of thought. Like Emerson, who attacked institutions and conformity, and from the growing belief in evolutionary theories, James sought to break away from European philosophy and to create a fresh, contingent way of dealing with the practical problems of daily life.

James was fascinated by mental states that suggested the existence of an extrasensory realm. He used hypnosis regularly and experimented with almost every drug he could obtain. He used a 'mind-cure' therapist who 'disentangled' his mind when he was suffering from insomnia. He publicly defended mind-cure practitioners, magnetic healers, Christian Scientists, and osteopaths. He was involved with both the British and American societies for Psychical Research. He spent much of his life pursuing scientific validation of the spiritual dimensions of the universe. His hypothesis was that there was a collective dimension of the universe in which individual minds were connected. Psychics and mental readers, he thought, possessed the ability to penetrate this dimension. He felt that if the existence of such a realm could be demonstrated, it would give credence to the traditional religious doctrine of immortality.

The most frequent attendee at the gatherings of the Metaphysical Club was Chauncy Wright. After his graduation in 1852, Wright was a computer and worked for the *American Emphemeris and Nautical Almanac*, a federally funded publication at which Benjamin Peirce was a consulting astronomer, and Peirce's brother-in-law Charles Davis was superintendent. Wright was a talented mathematician with a talent for assimilating ideas. He met Charles Peirce in 1857, when Charles was eighteen years old

and Wright was twenty-seven. They soon began meeting almost daily to debate philosophy. They held a common interest in mathematics, astronomy, and argument. They frequently debated cosmology. Wright was Laplacean with a twist; he did not think things happen by chance and that causation was simply too complex for our minds to grasp. Peirce was Maxwellian. He did not believe in the precision of physical laws; that facts are always susceptible to chance. Peirce believed Darwin had accomplished with organisms what Maxwell had accomplished with gases, applying the statistical method to biology. In their discussions on Darwin's theory of natural selection, Peirce pointed out that if scientific laws were not absolutely precise, then neither was scientific terminology. Peirce was the first scientist to perceive the problem this created. His mature philosophy on the theory of signs is obsessed with this problem (Menand, 2001).

Wright was always well informed on the latest work in philosophy, mathematics, and science. His goal appeared to be to serve as a local Socrates to Boston society. Socrates was his role model. He was a committed positivist at a time when positivism was most closely associated with French thinkers – Saint-Simon, Auguste Comte, Charles Fourier, etc. – but Wright disliked the French and considered positivism an Anglo-Saxon creation. He held Englishmen like Francis Bacon and John Stuart Mill in high regard. He considered facts the province of science and values the concern of metaphysics. He held the two in separate esteem and felt that values had no place in the pursuit of science.

Wright was enamored with Darwin's *On the Origin of Species*. Wright did not consider himself an evolutionist, which term he interpreted as the world getting 'better'. He was committed to the theory of natural selection. Wright was one of the few

nineteenth-century Darwinians who thought like Darwin; neither believed in a 'higher' or 'lower' species, but only in the theory of change through natural selection.

Wright took offense to people who misinterpreted or misapplied the theory of natural selection. He claimed that Herbert Spencer was not a positivist and that his theories were a flagrant violation of the separation of science and metaphysics. He felt that Spencer had created a concept of evolution that was inconsistent with reality. Wright objected to Spencer's adoption of Laplace's nebular hypothesis – that systems developed from lower to higher, from chaos to system. Laplace theorized that the solar system had evolved out of the sun's nebulae. Wright argued that there was no law that supported the movement from lower to higher forms in nature, that the same set of natural laws and accidental phenomena could just as easily lead to lower forms.

In regard to metaphysical questions, ideas about the origin and meaning of life, Wright was not opposed to speculation. He considered these questions as natural to human beings. He felt these questions were better left to the individual. Religious faith was acceptable if it satisfied an emotional need. In public matters he adopted a utilitarian philosophy that good is equal to the greatest happiness of the greatest number. He was neutral on the existence of a god, but hostile to organized religion, which he considered to be oppressive, and that no one had the right to impose his or her beliefs on any one else. Morality was another matter in that it is social and conventional. He considered morality as separate from philosophy, and that social moral norms could be imposed on others since they were simple rules of a given society. In his view, philosophers who persisted in devising abstract moral systems were involved in metaphysical word worship since it is impossible to justify our moral choices.

Wright felt that men were better off to operate on the grounds of common sense. Like so many in his time, the war taught him that beliefs have consequences. In regard to beliefs he took the stance that “Where we cannot be certain, we must affirm nothing” (Wright, as cited in Menand, 2001, p. 213). Wright’s perspective was a common phenomenon following the war; philosophical and scientific certitudes had failed to prevent, and may well have incited, four years of war and destruction. There was a pervasive sense of nihilism.

Private philosophical and literary societies were a common feature of the American intellectual landscape prior to the development of the modern university. Wright was a progenitor and participant in several of these societies located in Boston. In 1868 a group who referred to themselves as simply ‘The Club’ met for dinner on the second Tuesday of every month for intellectual and social exchange. The participants included Wendell Holmes, John Ropes, John Gray, Moorfield Story, Arthur Sedgwick, William Dean Howells, Thomas Sergeant Perry, Henry James, William James, Henry Lee Higginson, Henry Adams, and John Fiske.

Holmes identified with Wright’s positivism; it was a perfect match to his own disillusionment following the war. He agreed with Wright that logic and philosophy had little to do with people’s choices and behavior. He especially held this view in relation to the law. Over time he separated himself from James, who he thought too hopeful and anthropocentric. He never took much interest in Peirce, thinking his genius overrated. But he continued to admire Wright, who he credits with helping him formulate his own philosophy (Menand, 2001).

John Fiske was a prolific writer and introduced the common man to the advances and wonders of science. Fiske spent much of his early career, both as a lecturer and author, attempting to reconcile the theory of evolution with orthodox religious beliefs. In addition to numerous books and articles in various publications, he published no less than 80 articles in *The Atlantic Monthly*; a publication initiated in 1857, which by the late 1800s had a circulation of over 7,000 readers. In an article titled *A Century's Progress in Science* (Fiske, 1896), Fiske presented a summary of the discoveries of science and the impact of the theory of evolution on philosophy in the late nineteenth century. An ardent proponent of the evolutionist Herbert Spencer, Fiske condemned any philosophy or scientific approach that refused "to submit the phenomena of organic nature to the kind of scientific explanation which facts from all quarters were urging upon us" (p. 20).

The Metaphysical club began to pull apart in 1872. Peirce became acting assistant in charge of the Washington office of the Coast survey, spending much of his time there, relocating there in December. In June, Holmes married. In July, Wright went to Europe for four months. The last meeting of the club was held in November. The Metaphysical Club, like many of its counterparts, had served as a venue for intellectual exchange. The interactions between its participants affected and helped to evolve the philosophical position of each member. These men each made significant contributions to literature, law, and philosophy, thereby affecting public opinion, creating the foundation for American pragmatism.

One such individual who was influenced through his reading of Peirce, James, and Wright is John Dewey. Dewey's education in philosophy was rooted in German Idealism. Dewey earned his graduate degree in philosophy at Johns Hopkins University

in 1881. His doctoral dissertation was a study of the psychology of Kant. In 1884 Dewey was hired as a professor at the University of Michigan by his mentor and former philosophy professor George Sylvester Morris. Together, Morris and Dewey developed the University into one of the leading centers for German scientific philosophy and also established the psychology department at the University. Dewey saw psychology as the epitome of philosophic endeavor. In an article in 1886, Dewey commented on the relationship between philosophy and psychology. He claimed that “There is an absolute self-consciousness. The science of this is philosophy. This absolute self-consciousness manifests itself in the knowing and acting of individual men. The science of this manifestation, a phenomenology, is psychology” (Dewey, 1886, p. 164). During his first semester at the University of Michigan, he offered three courses: Empirical Psychology, Special Topics in Psychology, and Psychology and Philosophy (University of Michigan, School of Education, 2003).

Dewey worked at the University of Michigan until 1894 (with one year out at the University of Minnesota). In 1894 he took a position at the University of Chicago, which he held until 1904, after which he took a position at Columbia University.

Dewey developed his own version of pragmatic philosophy, which he referred to as *instrumentalism*, and which he carried with him to the University of Chicago. During his ten years at the University of Chicago, from 1894-1904, Dewey founded the Chicago School of Pragmatism. It was in Chicago that Dewey’s influence reached outside the halls of philosophy and psychology. Dewey and his graduates influenced the areas of economics, sociology, and religion as each of these areas in the University adopted pragmatic views. According to Dewey, experience is nothing more than the interaction of

a biological organism with its environment. Thinking is a means of dealing with an experience and working out hypotheses to guide one's actions. All thinking then, even scientific thinking, was instrumental in problem solving. Dewey promoted a philosophy that was *instrumental*; he believed his type of pragmatism had far-reaching applications for society, especially in education (Dewey, 1905; Oldroyd, 1986).

Dewey lived a long life and his influence extended well into the 20th century. He was the founder of the progressive education movement, which promoted problem solving over rote memorization in the classroom setting. He believed that teaching students problem solving would prepare them for living in a democratic society and enable them to better confront new situations. Dewey's influence in America was significant and is still evident within the U.S. educational system. He lived to be ninety-three (d. 1952) and became one of the most noted intellectuals of his time. He published books on psychology, ethics, education, logic, religion, politics, philosophy, and art; he wrote for journals, both scholarly and popular, and lectured extensively for all types of audience. He helped to create and lead many prominent political and education organizations: the American Civil Liberties Union (ACLU), the National Association for the Advancement of Colored People (NAACP), the League for Industrial Democracy, the New York Teachers Union, the American Association of University Professors, and the New School for Social Research (Menand, 2001; Popkin & Stroll, 1993).

ACT THREE

Scene 9

ADAM: It's amazing to think that someone born in 1859, before the Civil War, was still

alive when my parents were born.

MINERVA: We have a different sense of history than we once had. As you have already probably picked up – cultural systems and philosophic perspective were pretty stable for centuries at a time in ancient history. Now they can change with each generation. The rapid changes in science and philosophy have thrown us into a time when thoughts from twenty years ago seem ‘old’.

GEORGE: I sure see that in business. Everytime I turn around I’m getting a brochure in the mail about the latest ideas in business management.

ABBY: We get those too. I’m glad we just own the lodge and only have a few employees. I’d hate to deal with all the stuff that goes on in the corporate world.

ELLEN: Tell me about it! George has his own business, but he still only has about 30 employees. My department is bigger than his company. I get to deal with all the new MBA graduates they send us as consultants. Drives me crazy!

GEORGE: Well, the time we’re talking about is when all the management stuff took off. It was the industrial revolution that created the need for management. Who needed to worry about management when you ran a home business. It only gets really complicated once you get more than a few employees. I might not run a big operation, but I’ve got my hands full trying to figure out how to run 30 people efficiently.

MINERVA: The business revolution did create the need for a new way of organizing. We were a little slow in getting started in the US, but when we did we created systems based on a uniquely American perspective...

The American Business Revolution

In the newly formed United States, the social customs, values, the type of government, and the overriding pragmatic philosophic perspective, affected the form of business organizations, the ways they operated, and the local markets that stimulated their business. The social changes drove business change. The way businessmen perceive these forces is not often apparent to them – they are part of the society that formulates their operation – but these forces do affect their actions. For more than a century Frenchmen viewed market opportunities differently than Americans and therefore came to different conclusions. European businessmen sought rigid control of markets; American businessmen were cooperative with one another and willing to take more risk. In either case, the prevailing attitudes about man's position in nature and their beliefs affected the types of organizations that developed.

The most obvious characteristic of the American social structure was its lack of legally privileged elite. The loose class structure was based solely on property ownership rather than governmental, religious, or social status. Laborers in the North were not numerous and most, except for slaves, considered their condition temporary. After 1830, with the advent of urban industrialization, native-born whites tended to rise to middle class status, while new immigrants filled in the ranks of the lower class. Compared to European nations with higher populations, free, male, native labor continued to be a scarce commodity throughout the nineteenth century (Maier, Smith, Keyssar, & Kevles, 2003).

By the late eighteenth century, there were daily publications devoted to commercial news and advertising. Printing and publishing was a principal industry in all

large American cities, providing businesses with a steady flow of information and networking. Building, which represented the largest source of urban employment, was booming everywhere. Profits from construction were invested into international and inland trade. By 1800 craftsmen were prospering in home-based businesses and were quickly outgrowing the confines of the home. Cities had grown, rapidly developing business sections. Craftsmen moved their families elsewhere and converted the family home into a shop for producing and selling their wares. Between 1790 and 1820 cities grew from a population of 125,000 residents to roughly one million. Most of the population growth during this period was along the northeastern seaboard. Improvements in transportation supported trade between the states and the rapid dissemination of information. By 1840 the American businessman was one of the most well informed entrepreneurs ever before known in history.

The middle class, made up of small businessmen, farmers, and professionals, was a fluid group. Geographical and occupational movement was a continuous process. From the standpoint of growth or improvement in efficiencies, it was difficult for the middle class businessman to control the work of his neighbors, who held an equal status, as it was in the hierarchical societies of Europe. Despite weak controls, the per capita domestic product increased roughly sixty percent between 1800 and 1840 with an accompanying increase in non-agricultural labor from seventeen to thirty-seven percent of the labor-force.

The major eastern ports in Maryland, Pennsylvania, New York, and Massachusetts all competed in overseas trade. Each community felt that their general welfare depended on the promotion of their seaport. From independence until 1837 the

mercantile community of each of the major ports became increasingly afraid of competition from their rivals. Local governments joined forces with commercial enterprises to attract capital and trade to a degree not duplicated in Europe. The states were willing to delegate power to private business corporations, which they claimed would advance the general welfare of the community. Prior to 1800 neither England nor France had satisfactory legislation to support the development of corporate business enterprises. In contrast, the United States, with only a small fraction of the population of England and France combined, had incorporated over 300 private enterprises.

The corporate form had a number of advantages over partnerships. A corporation could be granted various monopoly rights, issue securities representing either equity or debt, set the value of such securities at a rate low enough to encourage wide sale, enjoy eternal life, and lease properties or lease itself to other owners. The corporation could also limit the liability of stockholders to the assets of the company, operate in receivership, be transferred to the control of its creditors in bankruptcy, and separate managerial control from ownership.

The separation of management and ownership allowed small businessmen to mobilize their savings and enter markets that may have been too remote for careful supervision of operations. With state approval, including the granting of monopoly privileges in some cases, and the corporate requirements for record keeping and voting privileges, it seemed safe to buy a few shares in a business located outside one's own locality. The duties of a salaried corporate manager, who owned little or no stock, was a gradual evolution from the 1820s on as transportation, insurance, and banking companies grew larger.

The new century ushered in a sense of expectation and excitement. The inauguration of President Thomas Jefferson took place on March 4, 1801 in the nation's new capital, Washington, D.C. Jefferson considered his election to be the 'Revolution of 1800', ending what he considered to be the repressive policies of the Federalists under John Adams. Jefferson spoke of the hope of the nation, of its expansion, rich production, and industry. Jefferson was a respected amateur scientist who included as his friends noted authorities on natural history, geology, geography, meteorology, and astronomy. He claimed science as his passion and politics as his duty. He served as the American ambassador to France (1784-1789) and carried back to the United States information about the latest European innovations in textile machinery, steam engines, and other technological advances.

Jefferson was well educated and an avid reader of classical history. He feared the fate of the Greek and Roman societies, brought about by the overcrowding of cities by property-less people. During his time in Europe, Jefferson witnessed the terrible poverty that existed in Paris and London. He was present in Paris when a mob attacked the Bastille, initiating the first phase of the French Revolution. Like Benjamin Franklin, he believed that manufacturing was founded in poverty, where the poor without land were available to work for others at low wages. He took a dim view of both cities and manufacturers. He favored expansion onto new lands, encouraged land ownership, and cautioned against encouraging citizens to work for one another. Agriculture and expansion were the essence of Jefferson's vision for the United States.

Jefferson was also a realist. He recognized that machine-based manufacturing was required in order to reduce America's dependence on foreign goods and to establish a

dynamic domestic economy. His politics reflected a conservative social philosophy and a desire to realize his vision of US expansion. During his first term in office, Jefferson purchased the Louisiana territory from France and sponsored the explorations of Merriweather Lewis and William Clark.

Jefferson was re-elected in 1804. In 1806 Lewis and Clark returned from their exploration, with maps, journals, and specimens from their trek. Newspapers from Kentucky to New York hailed their bravery and highlighted the national benefits of their journey. Many of the specimens and artifacts they collected ended up in Philadelphia at the American Philosophical Society, the Academy of Natural Sciences, and the Museum of Natural History. Many of the animal hides and plant specimens were completely new to the world of science. Philadelphia became the leading center in America for the study of natural history. The tremendous success of the expedition created an excitement for discovery and fervor for expansion.

Despite Jefferson's revulsion for manufacturing, political forces pushed him into action. America had remained neutral during the conflicts between England and France, profiting in maritime trade as a result of their neutrality. During the first two years of the Napoleonic Wars, world prices for farm goods rose and American shipping boomed while the French and English battled at sea. Conditions began to change in 1803 when France and England went to war for the fourth time in fifty years. In 1805, with England in control of the sea, and desperate for seaman, the Americans were drawn into the conflict. England ordered all vessels to stop first in English ports before trading in any Napoleonic-controlled European port. Napoleon responded by threatening to seize any vessel that complied with the British's blockade. The U.S. repeatedly protested the

violations of the English and French on America's rights as a neutral nation. British forces frequently halted American ships on the open sea and even within sight of American soil. The British seized contraband cargoes and seamen who they suspected of desertion from the British navy or being British subjects, impressing them into the British navy.

Between 1793 and 1811 nearly 1,000 seamen were forcibly removed from American vessels and forced into British service. Desperately short of manpower, the British ignored naturalization papers that claimed American citizenship and took anyone they suspected of being British. Even U.S. navy ships were stopped and seamen collected. In 1807 a British ship, the *Leopard*, fired on the American frigate *Chesapeake*, twenty-one men were killed before British officers boarded the vessel and arrested four suspected deserters. The American public cried out for action. Jefferson attempted peaceful negotiations. Although the British offered some conciliation, they insisted on their right to use force in retrieving deserters from the Royal Navy.

Jefferson was left with three choices: declare war, do nothing, or impose trade sanctions on England. He opted for trade sanctions on all of Europe. In effect, no U.S. ships would leave the country and none would be allowed to enter. The result was economic disaster; in 1808 trade dropped by more than eighty percent, prices for leading farm exports dropped by twenty-three percent. American merchants responded by building smuggling operations. Willing to use all means to suppress popular resistance to the embargo, Jefferson came dangerously close to subverting all civil liberties and protection of the Fourth Amendment in the interest of enforcing the law.

With the embargo, Jefferson unwittingly subverted his own passion to build an agrarian society, opening the door to a fundamental change in the American economy. Entrepreneurs, finding overseas commerce at a standstill and British products cut off from American markets, shifted their capital into machine based manufacturing. Samuel Slater, the founder of the first cotton-spinning mill in Pawtucket, Rhode Island, expanded his operations, adding three different textile mills by 1811 and at least a dozen other textile businesses before his death in 1835. Between 1807 and 1810 the number of American textile mills expanded from fifteen to eighty-seven. All along the Atlantic seaboard American entrepreneurs created new manufacturing ventures to meet consumer demand for American goods after the exclusion of British manufactures.

In 1808 Jefferson declined to run for a third term. Jefferson's friend and ally James Madison won the election. A few days before leaving office, Jefferson supported a congressional motion to repeal the embargo and replace it with an act that permitted trade with all European countries other than France and England. In 1810 when the act expired Congress replaced it with Macon's Bill Number Two. This law restored trade with both England and France with the promise that the US would cease trading with the other when one of them lifted their restrictions against American commerce. Napoleon jumped at the chance to align America in opposition to England and repealed French trade restrictions. Against the advice of John Quincy Adams, son of the former president, Madison announced that the US would no longer trade with England.

Napoleon did not live up to his side of the bargain. Over the next two years, the French continued to seize American merchant vessels. The relations between Britain and the US continued to deteriorate. Britain continued to impress sailors, violate neutral

rights, incite Indians, and refused to negotiate peaceful terms. In May 1812 Madison called on Congress to declare war against Great Britain. On June 18, 1812 he signed a bill declaring war against Great Britain. The War of 1812 lasted two and a half years. Britain blockaded American ports, virtually halting overseas trade. The war ended with the signing of the Treaty of Ghent on Christmas Eve 1814. On paper, the treaty left matters relatively the same as they were before the war. More notably, the War of 1812, like other wars, brought with it far-reaching economic, technological, and social changes.

Governmentally, change began with Madison's agenda for the military. Despite the popular belief that the United States had won the War of 1812, government officials knew that the conflict was mismanaged and under-supplied. Faulty arms, insufficient supplies, and poor strategies had plagued the war effort. In February 1815 Congress established national armories at Harper's Ferry, Virginia and Springfield, Massachusetts and authorized the U.S. Army Ordnance Department to directly supervise all private arms contractors. A program was quickly established to standardize patterns for all small arms supplied to the U.S. government and for the manufacture of firearms with interchangeable parts. By the early 1840s technology had improved to the point that the Springfield National Armory was able to produce 20,000 to 30,000 muskets annually with fully interchangeable parts. By 1864 the Springfield Armory developed the unprecedented capacity to produce 276,000 rifle-muskets a year.

The armories at Springfield and Harper's Ferry became national clearinghouses for the dissemination of mechanical knowledge. Technical information was made available free of charge. Private arms makers were able to visit Springfield, examine the most advanced tools and machinery, study production techniques, make notes and

drawings, and discuss common problems. Visitors were aided in replicating whatever they needed at machine shops nearby. The easy transfer of knowledge stood out in sharp contrast to the closely guarded practices in Europe. Openness and accessibility became trademarks of the American system of manufacturing. The techniques developed in the armories were adapted to other manufacturing establishments. Helping to push the change were former ordnance officers who left the army to pursue careers as managers in private industry. Skilled armory workers transitioned to new industries, carrying their skills with them. Firms large and small acquired the latest armory know-how by hiring experienced workmen. By the 1850s armory methods could be found in factories producing sewing machines, pocket watches, padlocks, railway equipment, shoes, wagons, and hand tools. The key to the transfer of practices were the New England machine-tool firms that were associated with the Springfield Armory (Maier, Smith, Keyssar, & Kevles, 2003).

Following the War of 1812, a group of Boston businessmen led by Francis Cabot Lowell decided to divert their capital from shipping to manufacturing after the British blockage virtually halted overseas trade. Lowell and his associates decided to focus on the manufacture of cotton cloth based on their belief in the existence of a lucrative North American market. Early in 1813 Lowell and his brother-in-law, Patrick Tracy Jackson, obtained a charter from the Massachusetts legislature incorporating the Boston Manufacturing Company. Their initial stock offering raised a remarkable \$100,000 (that later grew to \$300,000 and \$600,000). They then acquired a mill site on the Charles River eight miles west of Boston in the village of Waltham, where they built two large water powered factories for the production of cotton sheeting.

Lowell hired a master mechanic named Paul Moody to superintend the construction of the mills. Using a model provided by Lowell and the company's newly established machine shop, Moody built a working loom that went into operation in the fall of 1814. The newly invented powerloom was an innovation in the textile industry. Elsewhere in the US weaving was conducted in a separate facility from where the cotton was spun into thread. Lowell and his partners accomplished the feat of integrating the spinning and weaving process under one roof. In effect, raw cotton would enter the mill at one end and come out the other as finished cloth.

Workers, mainly young women, supervised by male overseers, took the raw material, cleaned and carded it, spun it into thread, and wound it onto bobbins, which fed the power looms that wove it into cloth. In a continuous manufacturing operation every phase of production was critical in the smooth execution of the next phase. Any irregularities could cause managerial problems. Profitability depended on a finished product with uniform weights and dimensions. As a result, early manufacturers like Moody and Lowell became obsessed in their pursuit of uniformity and control over every phase of production.

From their visits to other textile mills in England and the United States, Lowell and Moody learned that skilled workers, especially mule spinners and hand-loom weavers, could be independent, troublesome employees. Moody, therefore, applied his creative genius to creating a production system that eliminated the use of skilled labor by breaking cloth production down to its simplest elements. Each worker was assigned a single element in the process; the system was designed to disengage machines when something went wrong in the production line. The technology at the time only allowed

the production of coarse goods, such as used in the garments for slaves, and these became the production focus at the Waltham mill. The decision to produce cheap fabrics at Waltham proved to be a wise decision. Scores of smaller mills failed in the face of new British competition following the 1814 peace treaty with Britain. Once under full production in 1817 annual sales continued to escalate. In 1817 the company paid its first dividend of twenty percent and continued at similar levels over the next decade.

In 1822 the Boston Associates decided to expand their operations outside of Waltham by acquiring a site twenty-five miles north on the Merrimack River. The new center was named Lowell after the recently deceased Francis Cabot Lowell. The Associates incorporated the Merrimack Company in 1822 and the Hamilton Manufacturing Company in 1825. Over the course of the next seventeen years (1822-1839) Lowell grew from a quiet agricultural town of 200 people to an industrial center of over 18,000. Lowell became the leading producer of textiles, exceeding the production of the famous mills of Manchester, England. The nine textile corporations (with a total of twenty-nine mills) located in Lowell employed over 8,500 workers, three-quarters of whom were young women between the ages of eighteen and twenty-five. In order to meet the mill consumption of cotton, the Boston Associates built one of America's earliest railroads to move the raw material inland from the port of Boston. Business to support the mills and surrounding community sprang up in Lowell. With the ability to produce large quantities of materials, the Boston Associates actively supported an aggressive foreign policy that opened the doors to worldwide markets (Maier, Smith, Keyssar, & Kevles, 2003).

By 1840 America had an average standard of living far superior to that of most continental European nations, and over the next century was able to exceed that of Great Britain. Nowhere in the world was the social structure so favorable to rewarding business activity as in nineteenth century America. There were no strong centralized governmental, religious, or military orders blocking the commercial enterprise. Even landowning farmers were engaged in a business pursuit; with few exceptions American farmers bought and sold properties on a purely profit-making basis.

The scarcity of labor contributed to a higher standard of living in America. European observers were struck by the difference in factory conditions between America and England. Harriet Martineau, writing of the conditions she observed in 1835, describes the life of American factory workers

I visited the factory-establishment at Waltham, within a few miles of Boston... The establishment is for the spinning and weaving of cotton alone... Five hundred persons were employed at the time of my visit. The girls earn two, and some three, dollars a week, besides their board. The little children earn one dollar a week. Most of the girls live in the houses provided by the corporation, which accommodate from six to eight each. When sisters come to the mill, it is a common practice for them to bring their mother to keep house for them and some of their companions, in a dwelling built by their own earnings. In this case, they save enough out of the board to clothe themselves, and have their two or three dollars a week to spare. Some have thus cleared off mortgages from the fathers' farms; others have educated the hope of the family at college; and many are rapidly accumulating an independence. I saw a whole street of houses built with the earning of the girls; some with piazzas, and green venetian blinds; and all neat and sufficiently spacious.

The factory people built the church, which stands conspicuous on the green in the midst of the place. The minister's salary (eight hundred dollars last year) is raised by a tax on the pews. The corporation gave them a building for a lyceum, which they have furnished with a good library, and where they have lectures every winter - the best that money can procure. The girls have, in many instances, private libraries of some merit and value.

The managers of the various factory establishments keep the wages as nearly equal as possible, and then let the girls freely shift about from

one to another. When a girl comes to the overseer to inform him of her intention of working at the mill, he welcomes her, and asks her how long she means to stay. It may be six months, or a year, or five years, or for life. She declares what she considers herself fit for, and sets to work accordingly. If she finds that she cannot work so as to keep up with the companion appointed to her, or to please her employer or herself, she comes to the overseer, and volunteers to pick cotton, or sweep the rooms, or undertake some other service that she can perform.

The people work about seventy hours per week, on the average. The time of work varies with the length of the days, the wages continuing the same. All look like well dressed young ladies. The health is good; or rather, (as this is too much to be said about health anywhere in the United States), it is no worse than it is elsewhere (Martineau, 1835 as cited in Faulkner, 1924, pp. 289-290).

Harriet Martineau's account did not tell the whole story. While it is true that working conditions and the standard of living for American factory workers was far better than for their European counterparts, the conditions were still difficult. Hours of labor were long, varying from twelve to fifteen hours per day. As late as 1845 the average hours of labor in the mills in Lowell varied from eleven and a half-hours to thirteen and a half hours, depending on the season.

Despite the long hours of work in the factories, work in the mills offered an employment option for young women that did not exist elsewhere outside of farm life. Mills large and small cropped up throughout the northeast. Rural mills, often built by local farmers, became the springboards for villages and larger communities. A gristmill might result in a farmstead expanding into a small village with several houses, a general store, a blacksmith, church, post office and other businesses. Larger mill complexes developed into larger towns. Often the mill was a community's largest employer and the mill owners often owned other businesses in town. They helped to found and direct local banks, established local churches and public schools. Most mill owners, like Patrick Tracy Jackson, believed that the church was an important part of their success; churches

and schools fostered values of virtue, honesty, and thrift that carried over into the workplace. Mill owners often served as deacons, vestrymen, and trustees of the local churches. Early factories even looked like churches.

Mills, both small and large, were run on the straightforward objective of making a profit. In order to do so, it was necessary to create an environment that would encourage the worker to produce a profitable product. In order to handle the daily issues of running the mills, including the organization and control of workers, manufacturers resorted to traditional paternalistic practices. These practices varied depending on the size of the firm. Small mills, such as the Brandywine Iron Works, are noted for the implementation of Quaker ideals of kindness yet firmness in running the operation. In exchange for their paternalistic care the owner, Rebecca Lukens and her family, demanded loyalty and respect. Lukens, who inherited the mill after the death of her husband in 1825, created a safety net of employment for her twenty odd workers. Mill workers knew they would keep their jobs and company-owned housing even during hard times. The Lukens family provided food, fuel, and other supplies at reduced prices and ran the mill at no profit during economic downturns. In exchange, her workers were intensely loyal and remained at the mill during times when wages had to be reduced. Lukens later paid workers bonuses to compensate them for lower wages during slack times. When she finally relinquished control of the mill to her sons-in-law in 1847, she had completely rebuilt the mill, increased the workforce from twelve to twenty, and was producing some of the finest iron for steam-engine boilers in America. Under her leadership, the mill had gone from making nails and barrel hoops for local buyers to making heavier pieces of rolled iron for a national market.

The large textile corporations in Lowell adopted a different form of paternalism. Unlike the Brandywine Iron Works, which employed men living in the community, the Lowell mills employed over 6,000 workers, mostly young women, living in company dormitories. The success of the industry was based on the use of advance technology operated by unskilled workers. This allowed them to hire cheap female labor rather than more expensive and troublesome male workers. To attract a workforce required that they reassure young women and their families that Lowell was a good place to work. Mill owners emphasized a community that provided moral instruction and spiritual growth in addition to earning a wage.

Company regulations required girls to board in company housing, attend public worship, conform to the rules of the Sabbath, and to refrain from frivolous and immoral behavior. Foul language was not permitted. Dormitories were locked at ten o'clock each night. Mill girls enjoyed the 'pleasant life' while working at Lowell even though they also acknowledged the oppressive hand of the corporation.

The tight social fabric of Lowell served it well until the mid-1830s when economic hardship hit the city. Hundreds of mills sprang up in hopes of capturing some of the lucrative cotton industry. As competition increased and technology improved, the prices of cotton and profits began to fall. New investors who were buying out the aging members of the Boston Associates pushed to maintain handsome profits. Lowell companies and other New England mills began to adopt cost-cutting measures, the brunt of which fell on the workers. Newer, faster machinery was installed at Lowell; workers were assigned additional duties and piece rates were cut. Within a few years, production per worker had nearly doubled with very little increase in wages.

In February 1834 more than 800 women walked off their jobs in protest of a 12.5 percent wage reduction. The strike failed and the women returned to work within a few days. In 1836 the mill attempted to raise the price for room and board; 1500-2000 workers went on strike and succeeded in getting the companies to drop the increases. The company did succeed, however, in reducing wages in 1837 and again in 1840. In December 1844 the workers founded the Lowell Female Labor Reform Association with the intent on using political action to fight for reform. The Association joined with other labor and reform groups to attempt to get the Massachusetts legislature to limit factory work to ten hours a day. Their attempts at legislated reform were not supported by the legislature. With the replacement of the founders, the original paternalism of the Boston Associates turned into outright commercialism and social neglect. Under the new regime workers were viewed as commodities whose services could be bought and sold. The mills turned to hiring immigrant workers. Crowded slums replaced the once beautifully kept company boardinghouses (Maier, Smith, Keyssar, & Kevles, 2003).

While manufacturing became a pervasive form of urban life, the organization of labor proceeded slowly. Local craft unions began to appear as early as 1791. These local unions attempted to use collective bargaining to regulate the hours and conditions of work and took an interest in mutual insurance and benefits for illness and funeral expenses. By 1828 national trade unions began to form. The Philadelphia Mechanics' Trade Associations, formed in 1828, organized to work toward the establishment of free schools, abolition of imprisonment for debt, mechanics' lien laws, equal taxation, direct election of public officials, political and economic reforms, as well as shorter hours and better working conditions. The labor organization in Philadelphia initiated an American

labor-class movement. The primary objective of the early labor movement was the ten-hour day. By 1837 five national trade unions organized, stirring political agitation and placing pressure on local employers as a means to realize their objectives.

The depression in 1837 caused widespread unemployment – most of the unions disintegrated. It wasn't until the 1850s that national trade unions reorganized. By 1860 more than twenty trades had national organizations. The civil war provided an impetus for the labor movement. The war brought up concerns over the impact on northern labor with the possible liberation of slaves. The war increased the cost of living that was not met by a parallel rise in wages. Labor was angered by the congressional support of immigrant labor that continued to depress wage increases. Numerous local unions came into existence and by 1870 there were thirty-two national trade unions. Attempts were made to unite all labor into a single organization. The National Labor Union advocated the eight-hour day, the establishment of a government bureau of labor, and the exclusion of Chinese laborers. The attempt failed when an economic depression hit the country in 1873. Once again, business was depressed, unemployment rose, and laborers waged a series of unsuccessful strikes that were sometimes accompanied by violence and crime.

In July 1877 workers on the Baltimore and Ohio Railroad in Martinsburg, West Virginia, angered by the announcement that the railroad would cut wages for a fourth year in a row, threw down their tools and seized control of the local depot. The strike quickly spread to other rail centers from the East Coast to as far west as Kansas City and Omaha. Service across two-thirds of the system was disrupted. Local police, state militia, and federal troops were all called in to fight the emotionally charged, angry mobs. By the

time the strike was over, more than a hundred people lay dead and over \$10 million in railroad property destroyed.

People across the nation feared that the working class was in revolt, threatening a second civil war. The war did not materialize. The depression of 1873 took its toll. Most of the national unions dropped out of existence. The number of unemployed workers reached record levels in the prolonged depression of the mid-1870s. During the last decades of the nineteenth century, labor turned to political action and secret organizations out of which grew the American Federation of Labor in 1881. By the end of the century, however, unionism was once again on the rise (Faulkner, 1924; Thernstrom, 1989).

In 1881 the United States government began keeping records on union strike activities. From that point on labor disturbances multiplied. During the early 1880s there were nearly 500 strikes per year, involving over 150,000 workers. By the 1890s that number had increased to 1,000 to 2,000 per year with over 700,000 workers involved each year. Although earnings had increased dramatically between 1860 and 1890, the changes were sporadic and dramatic. Sharp rises in boom years were followed by abrupt cuts in periods of depression. The increasingly pronounced economic fluctuations meant that many American workers lived from week to week and day to day, constantly faced with the threat of unemployment. Unemployment rates soared even higher during the economic collapse of the mid-1890s. Even in an ordinary year, about a third of all laboring men could expect to be out of work for at least three or four months.

The depression of the 1870s, coupled with recovery from the Civil War, produced a period of national soul-searching. Throughout the nineteenth century many Americans looked upon economic downturns as a moral judgment, a period of punishment for the

country's sins. Depressions also laid bare the strain on human relations that was often cloaked during periods of prosperity (Thernstrom, 1989; Wiebe, 1967).

American Business at the End of the Century

The changes promoted by the social meliorists were slow to come. As late as 1913, bullets strafed the camp of strikers at the Ludlow, Colorado mine. The mine was owned by the Colorado Coal and Iron Company. Yet the owner, the philanthropic John D Rockefeller, Jr., although shocked by the action, felt no more responsible for the event than he would any unfortunate act of nature.

The situation wasn't any different in the steel and textile mills, the lumber camps, and the slaughtering houses. As the Spencerian laissez-faire mentality took hold, inhumanity no longer depended on physical distance. With the rise of the industrial city, there was also a rise in the number and size of urban slums. Slum dwellers were no longer looked on as merely a danger to society, but as a feeding ground for essential labor. Trouble in the tenements was handled with severity. Police were expected to break up gatherings and protect the propertied class from disturbance. Rather than being concerned for their fellow man, the violence of officials brought cheers from men worried about their property and wealth; a kind of brutality was exalted as a means to deal with the poor.

A similar spirit permeated business competition and practice. The owners of large corporations held the power to influence large numbers of people and to spread the concept of 'survival of the fittest' across the nation. While men acted with genteel nature in dealing with family and acquaintances, they meted out a cruel justice of animal like cunning in the business environment where the forces of nature were expected to prevail.

In an age when positivism and pragmatism joined together, and in a nation where the quantity of change was staggering, it seemed that society responded with a quantitative ethic that ignored the crisis in values. Men defined issues by quantity – how much, how many, and how far. Statistics provided proof that the United States stood first among nations. Although unemployment ran high and the people paid a staggering personal price because of economic fluctuations, the overall trend showed favorable. Increasingly people were judged based on dollars. A man rose or fell according to the balance in his bank account; and great wealth was amassed through the adoption of new technology following the Civil War (Wiebe, 1967).

Prior to the Civil War, the majority of industrial production took place in small workshops. There were exceptions, such as within the cotton textile factories. But most firms numbered their workers in the dozens at most; owners managed the majority of these companies. As a result, the owners had a vested interest in maintaining a stable workforce. Owners held a paternalistic attitude toward their workers and there was less of a sense of the owners and workers being members of opposing classes. Following the war, great wealth was amassed through the development of new technology that quickly replaced the small owner-operated industries. Absentee owners built large factories. For example, in Lynn, Massachusetts, the shoe capitol of the nation, small shoe ‘factories’ that employed three to six workers were replaced with large shoe factories. The newly invented McKay stitcher and other devices enabled factories to employ hundreds and even thousands of men. The social distance between employee and employer began to emerge on a wide scale in American society. Employers began to think of workers as mere extensions of their machinery – a quantitative factor in the cost of production. The

spirit of the new era was summarized in the 1883 *Thirteenth Annual Report* of the Massachusetts Bureau of the Statistics of Labor

I regard my people as I regard my machinery. So long as they can do my work for what I choose to pay them, I keep them, getting out of them all I can. What they do or how they fare outside my walls I don't know, nor do I consider it my business to know. They must look out for themselves as I do myself (as cited in Thernstrom, 1989, p. 520).

Labor was only a commodity. By the 1880s there were over 40 different job titles for employees in the shoe industry where before a single artisan could have made an entire shoe (Beard & Beard, 1944; Wiebe, 1967).

The lesson that workers were part of the cost of production, and therefore time was money, inspired the time and motion studies of Frederick W. Taylor in the 1890s. In his speeches and writings, Taylor proposed that managers should become scientific, study the organization of work, and create methods for eliminating industrial waste. He also advocated that foremen and workers needed to overcome disputes about work organization and compensation. Like Adam Smith, Taylor advocated the division of labor and held a firm belief that labor and management could both realize their interests by developing a shared interest in maximizing income through maximizing output.

In Taylor's study, he followed workers at a Bethlehem Steel coal yard with a stopwatch and clipboard. As a result of the study, Taylor ordered changes in work routines, producing spectacular improvements in worker output. According to Taylor, the maximum capacity of a worker could become known and used to assign a fair day's wage. Taylor's friendly despotism did not produce the positive results he envisioned. Taylor believed that scientific management would lead to harmony between labor and

business, with both benefiting from the system. His system, however, was used to develop a system that combined scientific management with social Darwinist theories. Following the success of Taylor's work, other industries hired time-study experts; production quotas and piecework systems were created. Workers were incented on production rather than by hourly wage. The growing intensity of labor required by profit-minded employers created dangerous work environments. The combination of overworked laborers and inadequate safety provisions resulted in a high accident rate. In the late nineteenth century, more than 35,000 laborers were killed annually and over half a million were injured severely enough to be incapacitated for more than three days. With half of the industrial labor force composed of immigrants, the majority of which were from non-English speaking lands, the lack of safety measures and poor training produced a hazardous work environment.

Although deaths and injuries were all incurred on the job, the victim and his family could expect little if any compensation. If a victim could afford a lawyer, the law provided that employers were liable only if clear poof of their negligence could be produced. If the mistakes of the employee or a fellow employee caused the accident, then the employer was held harmless. At the end of the century Social Darwinism, laissez-faire attitudes toward government intervention, and scientific management combined to produce a work environment where people were considered a cog in the machinery of the organization and were expected to fare for themselves. Their success or failure as individuals was deemed their sole responsibility (Thernstrom, 1989; Waring, 1991).

ACT THREE

Scene 10

JAKE: That was interesting. I never really thought about the differences in how the industrial revolution progressed in Europe vs. the US. We at least started out on the right foot including education as part of the mill-town mentality.

MARY ANN: I always thought of factories as oppressive. I guess I never considered the idea that they were part of the early liberation of women from the life of a housewife. Tough way to get a little liberty, but I guess almost everybody worked manual labor back then.

BILL: The presence of the factories, organized labor, and education must have created a different set of cultural norms than in Europe. Even though Europe had education, I don't think it had as literate a population as in the US.

ADAM: That brings us back to that question I asked yesterday about whether education is dangerous. If we can think for ourselves, it's a little harder to corral us.

MINERVA: And the US is very different as a result of early education, even back in the years before the American Revolution. As education spread we became less dependent on the education and investigation of only a minority...

American Knowledge and Social Thought

Throughout most of the nineteenth century, the American people depended on the investigations of individuals for the advancement of knowledge and thought. Government at the state and national levels explored topics such as population, wealth, natural resources, and the output of farms and factories. Knowledge of other matters and theories

were mainly provided by private persons who studied independently and published articles, pamphlets, and books. Toward the end of the century private industry began investing large sums of money into research in every domain of knowledge. Local and national governments took an interest in research. To a considerable and increasing extent, research and thinking became more specialized, organized, and heavily financed.

After the Civil War, industries expanded across the continent; markets widened to foreign shores; conflicts of capital and labor upset social peace; and the business of government became more complicated. Prior to the war, the government's main concern was confined to keeping order, building roads, collecting taxes, and administering poor relief. After the war, the government was involved in regulation of railways and utilities, labor relations, and complex social problems.

During the eighteenth century, Americans collected books, articles, and pamphlets dealing with the physical and human universe. Millions of publications were distributed in the nineteenth century covering a wide range of topics, including the physical resources of the continent, every branch of economics in detail, every tendency in action, thought, and aspiration. Americans had a voracious appetite for knowledge.

Systematic research for knowledge was fostered in American universities. State institutions were granted money to invest in laboratories, libraries, and to establish graduate schools for advanced studies in the sciences and arts. New universities were established on the basis of gifts from wealthy benefactors. The Johns Hopkins University at Baltimore opened in 1876 endowed by a leading capitalist of the city and named for him. Ten years later Stanford University was founded in California by Leland Stanford, a Pacific coast capitalist. In 1892 John D. Rockefeller provided the funds to open the

University of Chicago, which began the promotion of research and instruction in almost every area conceivable area. Even small universities were engaged in research.

Systematic research for scientific knowledge and discovery was also conducted in private industry. Large corporations built their own laboratories and engaged scientists to explore physics, chemistry, and mechanics in order to devise new commodities for manufacture. In the opening decades of the twentieth century, it became fashionable for wealthy men and women to establish foundations for the promotion of research in the sciences and humanities. The Carnegie Corporation, the Rockefeller Foundation, and the Russell Sage Foundation all engaged in research focused on improving the welfare of mankind.

Through publications and research reports, the American people had access to an increasing amount of knowledge. Americans could either purchase or access books through libraries on every subject of historical or current interest. The access to information affected new currents of thought. Two trends of thought emerged in the mid-nineteenth century: one placed the individual at the center of interest and elevated the role of individual enterprise as the primary source of invention, wealth, progress, and national greatness. The other emphasized society and general welfare as the primary concern and claimed that the individual, no matter how enlightened and powerful, owed his existence, language, knowledge, and opportunities to the society in which he lived and worked.

The first school of thought was labeled as individualism. The word 'individualism' first appeared in Tocqueville's book *Democracy in America* published in an English translation in 1835. Nineteenth century economists adopted the idea and built an entire system of thought around it. The concept of individualism was reinforced by

Charles Darwin in 1859 with his publication *Origin of Species*. Darwin was cautious in his statements, but stressed the struggle of the individual animal for existence.

“Darwinians” in the United States and other countries made dogmas of his theories.

Darwinian theory was used as justification for the actions of men trying to get rich quick.

The concept ‘survival of the fittest’ was used to excuse the accumulation of wealth by any means (Beard & Beard, 1944).

American society in the 1870s was centered on small town life, creating a sense of independent community living. Although there was trade between towns and the larger cities, the towns operated independent of one another. Farms that generally fanned out around the towns created a pace of life that moved with the rhythms of agriculture. Usually homogenous, and typically Protestant, a stable culture existed independent of the coming and going of community members.

A strong sense of individualism and empowerment was part of the American culture. It seemed that almost anyone with ambition could acquire the skills of a profession. The absence of nobility was replaced by the distinctions of social position. In small towns where financial differences were apparent, the location of a house, the amount of hired help, and the quality of consumed goods carried social meaning, and attracted far more attention than the same level of prosperity in a large city. At the top of the social ladder were the few who had greater wealth and who controlled access to it as well. These men, the merchants, bankers, and successful farmers, were referred to as “Mister” or military title rather than by first name. In the same manner, variations in ethnicity, religion, and accent distinguished individuals, groups, and entire communities.

Even in cities, life often retained the elements of town life. Neighborhoods developed, providing a separation from the city's core. Many home owners still had garden plots and a small number of livestock. Even the wealthy, the urban elites, who collected into their own self-contained communities, had little exchange with the rich and well-born in other cities. America was, in effect, a nation of loosely connected island communities, similar in kind, whose members often moved only to settle in another community of similar culture to the one they left behind.

It was from these independent communities that Americans sought an answer to the reasons for economic punishment. The reigning philosophic perspective was pragmatic, imbued with Scottish common-sense doctrines, taking for granted the belief that God ordained modesty in women, rectitude in men, and thrift, sobriety, and hard work for both. Immigrants accommodated themselves to this philosophic, Protestant code. Americans judged the world with the same perspective as with which they judged their neighborhoods. Their truths derived from what they knew. Consequently, calls for reform seemed reactionary. Deep inside, most Americans knew the path of virtue and success – and those who strayed from hard work and moral integrity simply had to return to the fold (Wiebe, 1967).

Between 1865 and 1900 the theory of individualism was expounded on in books, magazines, and newspaper articles. William Graham Sumner, a professor of political and social science at Yale University, was a leading advocate of individualism. Many of his contemporaries joined the cause, publishing treatises on the role of individualism in politics, economics, and personal success. When the twentieth century opened, individualism had become a potent force in American thought. Most Americans, without

giving thought to its origins, accepted individualism as a law of nature in private affairs and public policy. Recent American history, the expansion to the west, the rapid rise of industry, and the increase in national wealth all seemed to validate Darwinism and the power of the individual.

The philosophic perspective of Americans in the late nineteenth century provided the context for a file of coarse leadership and the crude exercise of power. Inhibitions that restrained a man in his own community seemed irrelevant in the decisions and treatment of people who were distant, or invisible. In the mining industry, absentee owners gave subordinates free reign to eliminate troublemakers. As a result underlings, hiding behind the name of the corporation, beat, shot, and trampled strikers' rights as citizens. Men were blacklisted throughout the region. As a result, workers turned to violence as a means to advocate for their rights.

The theory that human beings were engaged in a struggle for existence and that society was a product of such individualism was countered by a theory that society evolved out of the cooperative nature of human beings. Advocates of the associative principle in human life argued that ruthless individualism was responsible for most of the poverty, misery, and ugliness that marked the years of rapid growth in business enterprises. The ideal these humanitarians pursued was expressed in their own term 'social meliorism' – gradual, effective improvement by social action.

Led by Lester Ward, the social meliorists worked to counteract the impact of social Darwinism and individualism on American society. Ward was well prepared. After serving in the Union Army during the Civil War he entered the employment of the United States Government achieving distinction in scientific inquiry and reporting. While

engaged in his work, he took up the study of social evolution and in 1883 published the first volume of his *Dynamic Sociology*.

In *Dynamic Sociology* and subsequent works, Ward explored the cooperative nature of human societies throughout history. He collected a mass of knowledge to refute the position of the individualist or laissez faire doctrine of Herbert Spencer and William Graham Sumner. From his intensive study of history, Ward concluded that government, as a representative of society, should adopt measures directed to social improvement. Ward advocated a middle ground between stark individualism and socialism. His lectures and publications helped to anchor the idea of social meliorism in the American mind (Beard & Beard, 1944).

(enter David, wearing his winter coat and boots)

DAVID: Sorry to interrupt – we just finished plowing out the drive and unburying all your vehicles. Took us all afternoon!

MINERVA: Thanks, David. How is it looking for the roads?

DAVID: No sign of the county out on the roads. I'll call later and check on their progress and give you all an update after supper.

ABBY: Speaking of which, I think this is a good time to end our storytelling for the day.

I've got a big pot of stew ready for dinner. Anybody hungry?

JAKE: Yup *(jumping up)* – I am.

ELLEN: Why doesn't that surprise me!

MINERVA: Sounds good to me, I'm about talked out for the day. We're in the home

stretch in history – if we can't get out tomorrow, we can finish up our snow-in with a discussion on the twentieth century.

(Minerva, Jake, Abby and Dave all head toward the kitchen)

LINDA: Come on Justin – let's go outside for a little while before dinner.

JUSTIN: OK, hon. I'll go get our coats.

ADAM: *(looking over to Mary Ann and Toni)* Come on ladies, how 'bout another snowball fight before dinner?

TONI: You know you're going to regret that request! Come on, Mary Ann, let's burn up a little energy.

(the three of them race out the door with Justin and Linda trailing behind)

ELLEN: *(looking over to Bill and Irene)* We'll be down later – we're going to go call home and check on the kids. See you later.

(George and Ellen leave the room)

BILL: *(puts his arm around Irene)* Well dear, looks like we have a little time alone. All this history seems overwhelming. Makes me glad the two of us are so close and share so much in common. I'd hate to be facing all that world we are hearing about alone.

IRENE: Me too – and I'm glad we've got just enough Calvinism in us to believe that we are together for a reason.

(lights fade)

ACT FOUR

The Fourth Epoch: 1900 to 2005

Scene 1

(lights up – the fireplace is burning)

(Everyone wanders into the Great Room and takes a seat)

JAKE: Good breakfast, Abby. Nothing like a big stack of pancakes to start the day.

ABBY: Thanks, Jake, you make a cook feel good!

ELLEN: Watch out, Abby – if he stays much longer he'll clean out your pantry!

DAVID: I don't think we'll have to worry about that. The update from the county is that
they will have the road out to the main road cleared by tomorrow morning.

ELLEN: Good, my sister is ready to turn my kids back over to me and my boss is pulling
his hair out trying to cover for me.

LINDA: Things too tough for him?!

ELLEN: *(laughs)* You might say that – those new MBA consultants just dropped a new
business model on him and corporate is telling him to implement. My secretary
says we just landed another major account and they want a new up-to-date
account plan. And I have a grievance to settle because one of the employees
claims her rights were violated because she's an animal rights advocate and
somebody told a road kill joke at work! Maybe I need a couple more snow days to
hide!

JAKE: Kinda ties into what Minerva said last night about an increasing rate of change.
Maybe we can blame it on Einstein and his theory of relativity. According to him
space and time are all linked – so if change is happening faster its gotta make a

ripple in the time-space continuum.

ADAM: Sounds a little Trekkie to me. Beam me up Scotty.

MINERVA: You two are joking, but today's science fiction is tomorrow's reality – be careful what you predict.

BILL: Ok Minerva, I'm buckled in and ready to fly – launch us into the twentieth century and tomorrow's possibilities!

MINERVA: Let's start then in the momentous year of 1900...

The twentieth century ushered in the age of Modernism. Although the mark of a century is an artificial division of time, in the case of the twentieth century, the dividing line between centuries seems appropriate. In no other one hundred year period of time has so much changed at so rapid a pace. In no other century have so many been born and so many died at the hands of other humans as in the twentieth century. In 1900 the world population totaled 1.6 billion; by 2000 the population was more than 6 billion. During the century over 50 million died of famine and more than 100 million in warfare.

It was a century of rapid change. The telegraph in 1900 has given way to the Internet; for passenger travel the railroad has been all but replaced by the airplane. In 1900 a bicycle was considered "fast", now people can traverse the neighborhood on motorized scooters. Never before has there been as many inventions, books, and works of art produced. The amount of available knowledge is incomprehensible. There can never be another 'Renaissance Man' – an individual capable of being able to converse on all knowable topics in the world.

Yet, in spite of advanced technology, we have not been able to put an end to some of the age-old problems that have plagued mankind. Worldwide peace still eludes us; poverty, famine, and disease still run rampant in many areas of the world. In many ways we still debate the same questions and seek the same answers as our ancestors – is there a God? Where did we come from? What are the origins of the world? And, where are we going? The hopes we have held that science will provide us answers are still present, and yet so are most of the ancient faiths. The connections and tensions between science and philosophy played out in interesting ways in the last century (Chatterjee, Gould, Martin, Riley, & Wasserstrom, 2002).

The Advent of Modern Science

1900 was a year of significant discovery and scientific activity. In 1900 Arthur Evans discovered what he labeled as the Minoan civilization on the island of Crete. This civilization had been unknown previously and he was able to demonstrate that they were the first civilized Europeans. He named the civilization because of the frescoes that demonstrated the worship of the Minotaur. His discovery provided a piece of the puzzle in answering the question of human history.

In 1900 Hugo de Vries, a Dutch botanist, published a paper titled ‘The Law of Segregation of Hybrids’ and read it to the German Botanical Society. In the paper de Vries identified what later became known as genes. In the paper de Vries credited Gregor Mendel with the discovery, although his research and theories had fallen into oblivion. He re-discovered Mendel’s work after he had arrived at his own conclusions, having independently arrived at the same conclusions. In the same year two more botanists, Carl Correns, and Erich Tschermak, published papers on their research; each of them had also

independently come to the same conclusions as Mendel and de Vries. The mechanism for passing of dominant and recessive traits that these men discovered filled in a major gap in what has become labeled Darwin's theory of evolution (Watson, 2001).

1900 was also the year that Sigmund Freud (1856-1939), an Austrian psychologist, published his book *The Interpretation of Dreams*. In 1895 Freud and an associate, Josef Breuer, offered a new type of treatment of hysteria for women. Their *Studies in Hysteria* was a presentation of their research and experiments in treating patients. The book presented a new and unique analysis of mental illness. The two men soon split up because Freud became convinced that the cause of hysteria was always sexual trauma in childhood (whether real or imagined). Shortly after publishing his book on hysteria, Freud gave up normal medicine and started to practice a new form of therapy he called psychoanalysis.

Freud tried to be rigorous and precise in his methodology. He applied the scientific method of hypothesis, observation, and conclusions based on data. He believed, as a scientist, that it was possible to construct a comprehensive theory of the mind. Through a series of publications between 1895 and the 1930s, Freud expounded on his studies of the human psyche. He claimed that the greater part of our mental life, whether of feeling, thought, or action is unconscious; the second is sexual impulses. Freud described mental illness as primarily due to the sublimation of basic instincts (especially sexual drives), which creates an unstable state that emerges through mental illness and disorder. He believed that the unconscious is revealed in three ways: through everyday inconsequential mistakes, through dreams, and through symptoms of neurosis. Freud's theories became pervasive later in the century and incorporated into everyday language –

‘Freudian slips’, ‘complex’, ‘unconscious’, ‘libido’, and ‘obsession’ are just a few examples.

Before the century was a year old, we now had Freudianism and Mendelism underpinning Darwinism. The rediscovery of Mendel’s work and the new theories of Freud both added a new understanding of man in a completely different way. Both of the new systems were presented on the basis of science (although the merit of Freud’s work is now debated). Both systems also revealed to us what had previously been hidden from the human eye. Gene theory and Freudianism, coupled with the discovery of the new civilization on Crete, reinforced the view that plants, animals, mankind, and religions evolve (Chatterjee, Gould, Martin, Riley, & Wasserstrom, 2002; Kenny, 1998; Roberts, 1999; Tallack, 2001; Watson, 2001).

Adding to the excitement in 1900, Max Planck, a German physicist, took the first blow at long held Newtonian version of a mechanistic universe. Planck put together two well-known and documented facts and changed the way we look at physics. First, it had long been known that a substance changes colors as it is heated. Iron, for example, will first glow dull red, then bright red, then white. This is because the wavelength of light changes as temperatures rise. Planck was fascinated by this and linked it with the so-called ‘black body problem’. A perfectly formed black body is one that absorbs every wavelength of electromagnetic radiation equally well. Perfect black bodies do not exist in nature and are only man-made. According to the laws of physics at the time, a black body should only emit radiation according to its temperature and at every wavelength, therefore, a black body should only emit white light and never any color spectrum. Planck and his colleagues experimented with a black body made available to him by the

Bureau of Standards in Berlin, which was made of porcelain and platinum. His experiments demonstrated that the black body, when heated, behaved more or less like iron, giving off first dull red, then bright red-orange, and then white light.

In late 1900 Planck devised an equation to explain the behavior of radiation in a black body. The essence of Planck's theory was that electromagnetic radiation is not continuous and instead is emitted in packets of a definite size. Newton had said that energy was emitted continuously – Planck was contradicting him. Planck presented his theory to the Berlin Physics Society on December 14, 1900. He explained that light is created through the emission of packets of energy. When an item is first heated, it emits packets of light with less energy. As the temperature increased, higher energy packets are emitted. He called a packet of energy, or an 'atom' of radiation, a 'quantum'. A new theory of nature was devised. Nature is not a continuous process; it is a series of extremely small jerks. Quantum physics was born.

The discovery of quantum physics was ignored at first. Planck had a reputation for developing theories that experimentation proved wrong. When he presented to the Berlin Physics Society, he was politely ignored – no one asked a single question. It took four years for the importance of his discovery to be recognized. The man who grasped the concept, Albert Einstein, created a revolution of his own (Watson, 2001).

The scientific revolution of the eighteenth to nineteenth century was based on a faith in the predictability of the universe. Given the correct mathematical representation, scientists believed they could map out anything in the physical universe. This view actually came into question toward the end of the nineteenth century. Henri Poincaré (1854-1912) a Professor of Mathematical Physics at the Sorbonne in Paris began a study

of the motion of a simplified version of the Solar System, taking into consideration only the Sun, Earth, and Moon. In 1903 he demonstrated that this simple dynamical system, governed by Newton's laws of gravitation and motion, could behave in intricately unpredictable ways. The idea that small changes in initial conditions could lead to significant differences became the fundamental idea of chaos theory. His discoveries would lie dormant, much like Mendel's, until later in the century (Tallack, 2001).

The world changed in 1905. Working as a patent examiner in Germany, Albert Einstein (1879-1955) published four extraordinary papers in 1905 and went farther in that one year in solving the riddle of reality than any man before him. Einstein effectively abolished space and time. In his first paper, Einstein provided empirical evidence for the existence of atoms. In the second paper, he updated Max Planck's theory of radiation in which Planck proposed the idea of light quanta (now called photons). The third paper modified all theories of space and time – it proposed what later came to be called the Special Theory of Relativity. In the third paper, Einstein said that assuming the speed of light as a constant, then both time and motion are relative to the observer. In other words, time was not constant. Special Relativity led to the realization Einstein expressed in his fourth paper of the year, that the energy within an object is equal to its mass multiplied by the square of the speed of light: $E=mc^2$. The power of this equation was demonstrated in the atomic bomb.

Einstein wasn't finished challenging our view of the universe. According to Newton's law of gravity, the force of gravity works instantly over any distance. But according to Einstein's Special Theory of Relativity, nothing travels faster than light. Einstein struggled with this contradiction until 1907 when he had a revelation – he

realized that a falling person does not feel their own weight, therefore, acceleration and gravity must somehow be equivalent. This realization led him to what might be argued to be the most revolutionary physical theory in the history of physics. In 1916 Einstein expanded his theory of special relativity and named it the General Theory of Relativity. Einstein purported that gravitation is not a force, as Newton had claimed, but a curved field in a time-space continuum. All objects put a dent in the otherwise flat expanse of space-time. As objects move through space-time we see their paths curve. That is why the Earth orbits the Sun. He predicted that light passing through the gravitational field of a large body would follow the straightest path it could and would consequently follow a curved path around the body.

Einstein, using rational thinking and mathematics, theorized a new version of the universe. His theory of general relativity was supported with empirical evidence in 1919 by observations made by Arthur Stanley Eddington (1882-1944) and others during a solar eclipse. Eddington claimed to see stars shift out of place by the Sun's gravity. The announcement that Einstein had been correct made him world famous. Einstein won the Nobel Prize for Physics in 1921.

Einstein's theory also made for more alarming predictions. When enough matter is compressed then space is stretched to a breaking point, creating what appears to be a deep well in the space-time continuum and gravity becomes so strong that nothing can escape. This is a black hole. Astronomers now believe the universe is littered with black holes and that there is possibly a giant black hole in the center of our own galaxy. The theory of General Relativity can even describe the shape and evolution of the whole

universe and provides a possible explanation for why the universe seems to be expanding at an increasing rate.

Einstein propagated a scientific revolution that rocked the world. In the period of one year, he negated the scientific paradigm that had reigned since the time of Isaac Newton. Within ten years, he changed our entire perspective on the physical universe. The universe is not predictable – space and time are not absolute. Philosophers, who had for years rejected metaphysics in favor of positivism, were once again faced with a changing view of reality (Moore, 2002; Oldroyd, 1986; Tallack, 2001; Van Doren, 1991).

Darwinism and the Social Sciences at the Beginning of the Twentieth Century

At the beginning of the new century, Darwin's cousin, Francis Galton (1822-1911), and other Darwinians promoted the eugenics movement. Houston Stewart Chamberlain (1855-1927), an Englishman who moved to Germany and married a German, claimed that the Germanic people were the remnants of the Aryans described by Nietzsche, but interbreeding had degraded the race. Max Nordau (1849-1923), the son of a rabbi, claimed that a severe 'mental epidemic' had infected Europe, leading to degeneracy, hysteria, and a general sapping of vitality. Nordau believed the degeneracy was the result of living in an industrialized society. In Austria two political leaders, Georg Ritter von Schonerer and Karl Lueger claimed that Jews were the very embodiment of degeneracy spawning a rapid dissemination of anti-Semitism. It was into this cultural bias that Adolph Hitler was immersed when he arrived in Vienna in 1907 to attend art school.

In America, a debate raged over the whether Darwinism provided support for or against slavery. Chester Loring Brace argued that a common origin for all races proved

the error of slavery. Geologist Joseph le Conte, president of the American Association for the Advancement of Science, took an opposite stance and argued that when two races came into contact that one was bound to dominate the other. He claimed that the Negro, who was at an early stage of development, was fit for slavery because the primitive mentality could be shaped. More advanced races, like the 'redskin' were not suited to slavery, and therefore, were subject to extermination.

Social Darwinism was practically virulent in the United States. A deeply embedded belief in the superiority of the white race showed up in public practice and laws. A wave of 'Jim Crow' laws formally denied the black population their civil rights. In 1896 the Supreme Court decided in the case of *Plessy vs. Ferguson* that providing 'equal but separate accommodations for the white and colored races' satisfied the constitutional right of equality of all citizens.

The insidious nature of Spencerian Darwinism was evident at the World's Fair in Saint Louis, Missouri in 1904. The fair was the most ambitious gathering of intellectuals the world had ever seen. The fair was held as a commemoration of the hundredth anniversary of the Louisiana Purchase, and was originally referred to as The Louisiana Purchase Exhibition. The purchase of the Louisiana territory had opened up the Mississippi and helped turn the inland port of Saint Louis into America's fourth largest city. The fair was designed to appeal to the general public as well as the intellectual community. On the opening day of April 30, 1904 David R. Francis, the president of the Louisiana Purchase Expositions Company, announced to the 200,000 plus crowd that "So thoroughly does it represent the world's civilizations, that if all man's other works were by some unspeakable catastrophe blotted out, the records here established by the

assembled nations would afford all necessary standards for the rebuilding of our civilization” (The Saint Louis World’s Fair website, 2004). By the time the fair closed on December 1, 1904 an estimated twenty million visitors had reveled at the wonder displayed on the 1200 acre fair grounds.

Among the participants of the fair were John B. Watson, the founder of behaviorism; the president of Princeton University, Woodrow Wilson; the anthropologist, Franz Boas; historian James Bryce; physicists Henri Poincare and Ernest Rutherford; geneticists Hugo de Vries and T.H. Morgan; the sociologist and economist Max Weber; and although they did not participate, the work of Freud, Planck, and Frege was discussed. An exhibition at the fair displayed ‘the development of man’. The Anthropology Department’s intent was to reaffirm “the basic belief in the superiority of industrial civilization, which lay at the core of the Exposition’s appeal” (Missouri Historical Society website, 2004). The exhibits were open all day, every day, and included the largest collection of the world’s non-Western peoples ever assembled. There were members of over fifty-one different ‘Indian’ tribes (as Native Americans were then called), Inuit from the Arctic, Patagonians from the near-Antarctic, Zulu from south Africa, and a Philippine Negrito described as the ‘missing link’. In addition, Saint Louis was selected as the host of the 1904 Olympic Games. Using the games as an inspiration, an event labeled ‘Anthropology Days’ was organized in which the various members of the ethnic exhibition were required to compete in a contest to demonstrate the differing ‘fitness’ of the various races of mankind.

A new faith in evolution led to a belief in the natural superiority of certain people. In 1904 Galton published an article in the *American Journal of Sociology*, in which he

presented the basic concepts of eugenics – that the inferiority and superiority of the races could be objectively described and measured. In 1905 the German Race Hygiene Society was founded, followed by the Eugenics Education Society in England in 1907. In 1910 a similar society was founded in the United States, and in France in 1912. The arguments of ‘scientists’ sometimes bordered on fanaticism. F.H. Bradley, an Oxford professor, recommended that the insane and people with hereditary diseases and their children should be killed. In 1907 the state of Indiana passed a law requiring sterilization for inmates in state institutions who were “insane, idiotic, imbecilic, feeble-minded or who were convicted rapists” (Watson, 2001, p. 44). Frenchman Charles Richet wrote a book titled *Selection humaine* (1912) in which he advocated for the killing of all newborns with hereditary defects and the sterilization of all individuals past infancy who suffered from a whole range of defects ranging from birth defects to illnesses. In 1912 the International Eugenics Conference in London adopted a resolution calling for the governments of the world to create ‘breeding’ regulations.

Despite Darwin’s protests over the abuses of his hypotheses, even his own family adopted the views of Social Darwinism. Major Leonard Darwin, Charles Darwin’s son, became the president of the British Eugenics Education Society from 1911-1928. As president, he advocated that white people were ‘superior’ and should be encouraged to breed more while the ‘inferior’ races should be encouraged to reproduce less. Geneticists added to the fervor by theorizing and demonstrating that defects could be inherited. In 1909 the American geneticist Charles B. Davenport produced a paper in which he pointed out the ‘error’ in philosophy in light of the new science of genetic heredity

First of all it is necessary to point out that, until recently at least, human society was founded on a fundamentally wrong assumption that all men

are created alike free agents, capable of willing good or evil, and of accepting or rejecting the invitation of joining the society of normal men. But in recent decades legislators have come to realize that human protoplasm is vastly more complex than their philosophy conceived, and that the normal man is an ideal and hardly a real thing. Every man is a bundle of characteristics, and no two are alike. Not only does he have [different] physical characteristics...The position and connections of the association fibres of the brain may approach the typical condition or they may be so aberrant that the person misinterprets the things he sees. His brain may be incapable of developing properly in single or all directions so that he remains with defective judgment, memory and, even, instincts, unable to appreciate the traditions of human society or, perhaps, impelled constantly to run counter to the fundamental principles of the society – tearing them to shreds...Heavy is the toll human society pays for the presence of these degenerates...

If these qualities of degeneration were merely sporadic, accidental due to a rare combination of environmental conditions, human society could protect itself sufficiently by secluding the feeble-minded, imprisoning those with active psychoses, and putting to death those with homicidal tendency. But, on the contrary, just the defective conditions are inevitably transmitted in the germ plasm and are apparently being reproduced faster than the more normal characteristics...At a time when, through prudential restraint, the birth rate of the best blood of our nation barely suffices to replace that lost by death, the unrestrained, erotic characteristics of the degenerate classes are resulting in large families, which are withdrawn from the beneficent operation of natural selection by a misguided society that is nursing in her bosom the asp that may one day fatally poison her (Davenport, 1907, pp. 16-17).

Davenport provided evidence that laziness, licentiousness, and idiocy are inherited traits, and that no amount of training could remove the ‘defect’. He recommended first that “the scandal of illegitimate reproduction among imbeciles must be prevented...[and that] at least operations should be required that will prevent the reproduction of their vicious germ plasm” (pp. 20-21); and secondly that people should be taught the power of genetics so that they could “make for themselves suitable matings” (p. 21). And Davenport was hardly alone. The vogue amongst anthropologists of the time was the demonstration of the inferiority of the non-European races.

There were a few, however, who removed themselves from the philosophic debates surrounding Darwinism. Franz Boas (1858-1942), a German anthropologist, greatly influenced American anthropology. At the turn of the century he studied several groups of native Americans living along the Pacific Coast and near Vancouver. Boas developed a theoretical framework that became known as cultural relativism. Following his research, he moved to the United States to write for *Science* magazine; he later became the curator for the American Museum of Natural History, and went on to hold the position as first professor in anthropology at Columbia University. While working for the university, Boas was commissioned by the U.S. Senate to research and report on the impact of immigration. Politicians worried that there might be too many immigrants of the 'wrong sort' and that immigrants might not, because of genetic reasons, be able or willing to assimilate. Boas showed that immigrants actually assimilate rapidly, barely taking more than one or two generations, and that the diversity of human culture is determined primarily by environment and not heredity (Andrews University website, 2001; Watson, 2001).

On a more positive note, Darwinism was adopted as a demonstration that man could improve. It was due to this belief that men like Theodore Herzl (1860-1904) and Max Weber (1864-1920) looked to religion as a shared experience of man as a means to make life bearable in modern cities. Herzl, the son of a Jewish merchant, chose to ignore the growing anti-Semitism of Vienna. He thought the Jews should assimilate and be identified with the liberal aristocracy. In 1891 Herzl was appointed as the Paris correspondent of the *Neue Freie Presse*. While in Paris, he underwent a transformation of his views on Jewish assimilation. During his stay in France, he met with a growing anti-

Semitism. He found France to be no different than Vienna, where the anti-Semitic Karl Lueger was working his way toward becoming mayor.

At the end of 1895 Herzl attended a performance of *Tannhauser* at the Opera in Paris. The opera illustrated the irrationalism of national politics. He immediately set out to create a strategy for the development of a new independent nation for Jews. Between 1895 and his death in 1904, Herzl is credited for creating the Zionist movement.

In 1904 Max Weber published one of the foundational works of modern sociology. His book *The Protestant Ethic and the Spirit of Capitalism* immediately sparked a critical debate. Although Darwinism is not mentioned, it is inherent in the idea that Protestantism grew out of more primitive faiths and produced in turn a more advanced economic system. Weber approached economics from the perspective of history, adopting the idea that the understanding (*Verstehen*) of meaning is essential to the explanation of human action and searched for a causal explanation in the social sciences. He claimed that the new economic capitalistic system was more advanced because it valued the Protestant ethics of work, morality, and service and it therefore benefited more people. He also stated that

the capitalism of to-day, which has come to dominate economic life, educates and selects the economic subjects which it needs through a process of economic survival of the fittest. But here one can easily see the limits of the concept of selection as a means of historical explanation. In order that a manner of life so well adapted to the peculiarities of capitalism could be selected at all, i.e. should come to dominate others, it had to originate somewhere, and not in isolated individuals alone, but as a way of life common to whole groups of men (Weber, 1995/1904, p. 55).

Weber's inclusion of religion and capitalism in the same context sparked the animosity of contemporary Marxists. His characterization of Catholicism as lacking in discipline and as an inhibitor of economic development roused the ire of Catholic historians. His linking

of Puritan sects with the 'iron cage' of modern culture did not curry favor with Protestant thinkers.

Despite the controversies roused by Weber's thesis, his effort produced a distinctive new style of historical study that combined a "sensitivity to diverse cultural meanings with an insistence upon the fundamental causal role of 'material' factors in influencing the course of history" (Giddens, 1995, p. x). Weber claimed that his study "may thus perhaps in a modest way form a contribution to the understanding of the manner in which ideas become effective forces in history" (p. 90). He did not claim that the spirit and system of capitalism arose out of the Protestant Reformation. His goal was to "ascertain whether and to what extent religious forces have taken part in the qualitative formation and the quantitative expansion of that spirit over the world" (p. 91). He applied the scientific method, and its attendant search for cause and effect, to the study of human history and behavior (Himmelfarb, 1962; Mosse, 1988; Watson, 2001; Weber, 1995/1904).

ACT FOUR

Scene 2

JUSTIN: Sounds to me like Weber picked up on some of the ideas of those German guys,

I think you said their names were Herder and Fichte, who had the idea that history was metaphysical.

MINERVA: Good job, Justin – you are really paying attention. Yes, Weber looked for patterns in history to explain cause and effect. He applied the scientific method to the study of sociology.

MARY ANN: I still think that's a little far-fetched. How can we find cause and effect in something as complex as sociology?

MINERVA: Have you yet accepted the premise that differing philosophies drive different questions and the search for different answers?

MARY ANN: I think I can accept that. But not entirely. I think I'd still want some of the same things out of life whether I was a socialist or a capitalist.

GEORGE: Why do you think that?

MARY ANN: (*Shrugs*) It's like the line in the old song by Sting – "Russians love their children too".

TONI: But look at the system they allowed to be created because they accepted a twisted form of Marxism. We have Marxism in the US, but it showed up in labor unions, not government oppression.

MINERVA: I think in order to understand where we are today philosophically we need to understand the divergent streams of philosophic thought that took off in the twentieth century. There were very different philosophies that developed in the US, Britain, and continental Europe...

At the turn of the century there were several well-known philosophers then living, among them Henri Bergson (1859-1941), Edmund Husserl (1859-1938), William James, John Dewey, Gottlob Frege (1848-1925), Alfred North Whitehead (1861-1947) and Bertrand Russell (1872-1970). James and Dewey were Americans who carried American pragmatic philosophy into the twentieth century. Henri Bergson was a French philosopher and the most famous of the group. Edmund Husserl was Austrian, Gottlob

Frege a German, and Bertrand Russell and Alfred North Whitehead were British. Each represents a differing philosophy based on the culture in which they acquired their world-view.

Continental European Philosophy in the Early Twentieth Century

Edmund Husserl was born in the same province (Moravia) and in the same year as Freud. He studied at Berlin, Leipzig, and Vienna. His first interests were mathematics and logic, but like Freud, he found himself drawn to psychology. At the time of his studies, psychology was taught as an aspect of philosophy. Husserl earned his PhD in mathematics in Vienna (1883) and then took up the study of philosophy. He was a student of the psychologist/philosopher Franz Brentano (1838-1917), who published *Psychology from an Empirical Standpoint* in 1874.

Brentano made contributions to many fields in philosophy, especially ethics, ontology, logic, the history of philosophy, and the philosophy of theology. He was strongly influenced by the study of Aristotle and the Scholastics, as well as by the empiricist and positivist movements. He was ordained a Roman Catholic priest in 1864, but gave up the priesthood following a series of heated debates in which he opposed the dogma of papal infallibility.

Brentano investigated the human mind, rejecting idealism and the notion that there was some universal, abstract 'Geist'. He claimed that psychology could not take some abstract metaphysical concept as its point of departure, but, like any other science, must start from the individual case that could be directly observed by the investigator. Brentano moved from empirical psychology to the philosophical study of the nature of

first-person knowledge. He questioned what it is we know when presented with the contents of consciousness and how the knower is distinguished from the known.

In his attempt to answer these questions, Brentano reintroduced a concept common in the mediaeval schools: the concept of intentionality. He argued that every mental state or event is referenced to the content or directed upon the object of the event creating the concept of an internal aim or intention. He believed that intentionality is a common property of all mental phenomena. Brentano was a charismatic teacher and influenced a great number of students throughout his lifetime. Many of his students became philosophers and psychologists, such as Edmund Husserl, Alexius Meinong, Christian von Ehrenfels, Anton Marty, Carl Stumpf, Kasimir Twardowski, as well as Sigmund Freud, and many became professors all over the Austro-Hungarian Empire. Another of Brentano's students, Tomas Masaryk, became the founder and first President of the Republic of Czechoslovakia where he set up the study of Brentano's philosophy. Brentano is responsible for the developing the Austrian tradition in philosophy (Huemer, 2003; Scruton, 1995; Sedgwick, 2001).

Brentano's influence on Husserl is evident in Husserl's adoption and adaptation of Brentano's intentionality. As a result, Husserl is noted as the first important phenomenologist, a term he created. Phenomenology is a word with two components: 'phenomenon' and 'logos'. Phenomenon derives from the Greek *phainesthi* – meaning 'to show itself' or 'the manifest'. Logos means 'discourse'. Therefore, phenomenology means to let that which shows itself be seen from itself. In 1900-1901 he published *Logical Investigations*. In *Investigations* Husserl presented the theme of phenomenology. His philosophy of phenomenology was more fully presented in 1913 in his book *Ideas*

Pertaining to a Pure Phenomenology and to a Phenomenological Philosophy. In these two books he begins the description of his method of phenomenological reduction. His method is based on two major premises. First, he affirms the Cartesian position that immediate personal knowledge of one's own conscious mental states is the foundation for understanding the nature of those states. Second, the intentionality of the mental makes 'meaning' or 'reference' essential to every mental act. Husserl's philosophy became known as transcendental phenomenology. He believed the task of philosophy was to describe the world in the context of ordinary experience. He became a leader in the so-called continental school of twentieth century philosophy.

Husserl's peer, Christian von Ehrenfels, another student of Franz Brentano, became the founder of Gestalt philosophy and psychology. Ehrenfels modified Brentano's ideas claiming that the mind intends Gestalt qualities. He argued that there are particular 'wholes' in nature that the mind and nervous system are pre-prepared to experience. Gestalt theory became very popular in German psychology for a short period of time (Sawicki, 2001; Sedgwick, 2001; Scruton, 1995; Watson, 2001).

Henri Bergson was born in Paris in 1859 the son of a Jewish Polish musician and an Anglo-Irish mother. As a young man he displayed a mathematical brilliance. He graduated from Condorcet and in 1878 was admitted to the Ecole Normale. After graduation he served as a philosophy teacher at a series of lycees, finally settling in a post as a professor at the College de France in 1900. Bergson's first books *Time and Free Will* (1889) and *Matter and Memory* (1896) reflected the influence of phenomenologists Franz Brentano and Husserl. Bergson argued that there should be a sharp distinction drawn

between physical and psychological processes. He concluded that the methods used to explore the physical world were inappropriate for the study of mental life.

In *An Introduction to Metaphysics* (1903) Bergson claimed that intuition – and not analytical reasoning – was the source of all discovery. Then in 1907 he published *L'Evolution creatrice* (*Creative Evolution*), firmly establishing his world reputation and extending it beyond the world of academics. The book was immediately translated and published in English, German, and Russian. His weekly lectures at the College de France drew crowds from both the Parisian and international elite. His basic premise in the book is that time is real and that the future does not in any sense exist. His philosophy flew in the face of the scientific determinists of his day who were claiming that life was merely the unfolding of an already existing sequence of events; the future was simply the part of the sequence that remained to unfold.

Bergson thought that scientific determinism was ridiculous. There were only two types of time: physics-time and real time. Real time, as we understand it, requires memory; conversely, physics-time was simply a long strip of nearly identical segments where the segments of the past perish almost instantaneously. Real-time is not reversible, each past segment affects the next; if it requires memory in order to exist, then it must be to some extent psychological. (This seemed an affront to the Catholic Church and interference in God's domain. In 1914 the Vatican placed all of Bergson's books, but especially *L'Evolution creatrice* on its Index of Prohibited Books). If time is merely a psychological process then for Bergson the entire process of evolution is also a psychological process. Echoing the philosophy of Brentano and Husserl, Bergson was

affirming that evolution, rather than being a truth that is 'out there' is itself only a product of an 'intention of the mind'.

Bergson's appeal to the French mind and others was his firm belief in human freedom of choice and the metaphysical concept he called the *elan vital*, the vital impulse or life force. For Bergson rationalism was not enough, and to it he added an intuitive force. This intuitive force is what made humans qualitatively different from animals. He represented to the younger generation that flocked around him a redemption of Western thought from the nineteenth-century 'religion of science' (Lawlor & Moulard, 2004; Watson, 2001)

British Philosophy in the Early Twentieth Century

While most Continental philosophers were moving away from the empirical and entering a new phase of idealism, many of the British philosophers transformed philosophy and adopted a realist approach to philosophy. Gottlob Frege, Bertrand Russell and Alfred North Whitehead were all pioneers in the exploration of logical basis for mathematics, descriptions, and in the formulation of a rational philosophy of metaphysics. Whitehead, who was one of Russell's instructors at Cambridge, was a primary player in the British revolt against idealism in the early part of the twentieth century.

There are a number of British philosophers who contributed to the realism movement. The premise of realism is that there is a real and knowable world of things existing independently of sense-data and that universals would exist even if there is no mind to comprehend them. As such, philosophers who pursued the course of realism often applied mathematical logic to the age-old questions of philosophy.

Gottlob Frege served as one of the principal founders of mathematical logic. He earned his doctorate in philosophy at Gottingen and taught at the University of Jena from 1874 until his retirement in 1918. He lived a quiet and secluded life and as a result was not well known in his own lifetime. His impact, however, is profound. His impact on the development of mathematical logic affected the thinking of innumerable philosophers and mathematicians who followed him. His system of logic served as one of the major contributions to the developments of other disciplines, which eventually resulted in the development of computers. He therefore made an impact on the lives of all humanity.

Frege's first publication in 1879 was a pamphlet titled *Begriffsschrift (Concept Script)*. The concept script he created was a new symbolism designed to bring clarity to logical relationships that were hidden in ordinary language. Although the script was elegant, it was difficult to handle in typographical form. His concepts were retained with a change in symbolism; the calculus that was formulated by his system formed the basis of modern logic. Frege replaced the Aristotelian syllogistic with the propositional calculus first explored by the Stoics. The fundamental principle of this system is to treat the truth-value of sentences with connectives (such as 'and', 'if', 'or') as being determined based solely on the truth-values of the component sentences that are linked by the connective. The composite sentences are then treated as truth-functions. Frege presented the first systematic formulation of the propositional calculus; all laws of logic are then derived, by specified rules of inference, from a number of primitive principles. Frege also invented a quantification theory - a system of symbolizing and displaying those inferences. Frege then introduced into logic the terminology of algebra.

Frege effectively overthrew the Aristotelian logic that dominated Western philosophy, laid the foundation for the modern philosophy of language, and demonstrated the connection between logic and mathematics. Combined Frege's contributions provided the basis for the modern analytical philosophy of Russell, Whitehead, and later for Ludwig Wittgenstein (1889-1951). Russell and Wittgenstein built on Frege's logic to establish a new epistemology, a new metaphysics, and a new purpose for philosophical argument.

Frege rejected Aristotelian logic, and therefore the logic of Kant, in favor of a type of Platonism. He believed in a realm of mathematical truths that was outside the human capacity to acquire knowledge of it. Although he believed mathematics to be analytic and not synthetic (as in the case of Kant), his ideas led not to an understanding of a truth independent of human intellect, but to the projection of human intellect into logical space. Frege only partially accepted the conclusion that if we have *a priori* knowledge of a mathematical truth, it is only because we constructed that truth. This is the same argument used by ancient nominalists, even though at the time they lacked the means to determine whether it applied to mathematics. This interpretation of mathematics makes a tremendous impact on philosophy. Indeed, Platonism and the entire rationalist tradition rested on mathematics as an example of 'truths of reason'. Mathematics was used as a demonstration of the superiority of reason over empirical investigation. Kant had identified metaphysics with the realm of *a priori* knowledge using mathematics as the most persuasive example. The demonstration that mathematics is analytic and not *a priori* knowledge opened the way to an entirely new and modern rejection of the metaphysical argument.

Frege used the misuse of mathematics by John Stuart Mills to demonstrate that an empiricist could completely know mathematics and yet completely misunderstand it. Mill, as an empiricist, argued that the ideas of numbers are abstractions from experience. Mill was not able to account for our understanding of the number zero and fixed our mathematical knowledge within the realm of our experience. Frege demonstrated that we can understand and accept the symbolism of a number that we had never experienced. He argued that mathematics is intelligible independent of experience and applications. He demonstrated that numbers are neither objects, properties (as of an object), nor abstractions. Starting from the logic of existence Frege thought of numbers as a property of a concept, or a second-order property. Frege then went on to create a definition of number in purely logical terms and that denotes a property of a concept. Frege's system was ingenious and was marred only by Russell's discovery of a paradox, the resolution of which seemed to require the application of metaphysical assumptions in order to solve. Frege's system of mathematical logic was eventually disproved by Kurt Godel (1931) who proved that there are arithmetical truths that are unprovable in any logical system, therefore logic cannot embrace mathematics. But Frege came so close to reducing arithmetic to logic that Godel's theorem and Russell's paradox simply elevated the importance and status of mathematical truths as one of the most important philosophical problems. In addition to his contributions to the study of logic, Frege also renewed the philosophic debate over the nature of language and representation, demonstrating that symbols could be used to denote concepts and not just objects.

Frege demonstrated that statements of identity are different in the same statement that predicates a property of an object, and that the meaning is derived contextually. In

other words, it is only in the context of a sentence that a word has definite meaning and that therefore, the meaning of any sentence is derived from its component parts. This mutual dependence of the part on the whole and the whole on the part is characteristic of language, which is what makes language learnable. With only a finite vocabulary, an individual can create and understand an indefinite number of sentences. Language-use is an automatically creative process that gives us the capacity for unlimited thought. Once he had established an understanding of the meaning of words he then tackled the question – To what do sentences refer?

In answering this question, Frege had to struggle with the idea that sentences can be either true or false. Therefore, Frege concluded, the only possibility is that sentences refer to their own truth value; that is – to truth or to falsehood. Then – just as the sense of a sentence is dependent on the sense of its parts – then the truth-value is dependent on the reference of the individual words. The implications of Frege's philosophy are extensive – if he is right, then the philosophic distinctions between extension and intention can be applied to sentences. The extension of a sentence is its truth-value and the intention is its truth-condition. The entire sentence can then serve as a representation that stands for the true or false. Sentences are no longer merely assertions, they are representations of truth. Frege also believed that the relation of a sentence to its truth-conditions must be determined objectively, which is then a metaphysical assumption; the assumption of an objective truth to which all our language is aimed and from which they take their sense.

Frege's philosophy has been slowly adopted into the framework of modern analytic philosophy, renewing the fundamental questions posed by Kant's metaphysics. The study of language and to what it refers inserts a metaphysical element. Philosophers

were once again challenged with setting a course somewhere between empirical sense-data and transcendental realism. British philosophers carried on Frege's commitment to the development of logic, most notably of who was Bertrand Russell (Copleston, 1967; Frege, 1948/1892; Kenny, 1998; Scruton, 1995).

Unlike Frege, whose area of study was the narrow but very deep study of logic, mathematics, and language, Russell was a more diversified philosopher with an interesting educational background. He was the godson of the philosopher John Stuart Mill. At a young age, he was given a private tutor who was not only an agnostic, but also introduced him to the works of Euclid and Marx. At the age of seventeen he entered Cambridge to study mathematics where he came under the tutelage of both the mathematician Alfred North Whitehead and the noted philosopher G.E. Moore. Upon graduation with a degree in mathematics, Russell turned whole-heartedly to philosophy, seeing it as sort of a no-man's land between science and theology.

While still at Cambridge, Russell took up an interest in politics, especially the socialism of Karl Marx. Following a visit to Germany he published his first book, *German Social Democracy* (1896). In his second book he wrote on Leibniz, one of his favorite philosophers. He published another book in 1900 titled *The Principles of Mathematics* in an effort to advance the view that mathematics is based on logic. During his research for the book, he was concerned with classes of objects. What he discovered was an unanswerable paradox, that the class of an object is not the object and therefore does not belong to the class (e.g. a teaspoon belongs to the class of teaspoons, but the class of teaspoons is not itself a teaspoon, and therefore does not belong to the class).

Neither Russell nor his mentor Whitehead could solve the dilemma and decided to go ahead and print *Principles* without tackling the paradox.

Late in 1900 Russell purchased and read Frege's *Grundgesetze der Arithmetick* (Fundamental Laws of Arithmetic). He had read Frege's *Begriffsschrift* in the 1890s but had failed to understand it. But on reading Frege's new book on arithmetic Russell realized, much to his chagrin and consternation, that Frege had anticipated the paradox and had also failed to find a solution. Nevertheless, Russell's book *Principles* was the first comprehensive treatise on the analytic logic of mathematics to be written in English.

Russell and Whitehead set out to explore the foundations of mathematics in an effort to extend existing algebra and to possibly explore a new range of logical relationships. What started out as a yearlong project, turned into a ten-year project. Whitehead was the superior mathematician, but Russell spent seven to ten hours a day, six days a week working on it. Their work was published in three large volumes titled *Principia Mathematica* between 1910 and 1913. The three volumes were written in a system of symbols rather than every day language. The publication of volume one engendered a sense of awe among colleagues both at home and abroad. Very few have actually read the entire three volumes, which number over 4,500 pages full of symbols and formal proofs. Nevertheless, Russell and Whitehead added to the philosophy of Frege having discovered and proven that most mathematics (though not all) can be derived from a number of axioms logically related to one another. This championing of mathematical logic inspired such later figures as Alan Turing and John von Neumann, mathematicians of the 1930s and 40s who would conceive of the early computers.

Along the way, in 1906, Russell also solved the paradox by creating a theory of types. The solution was actually logico-philosophical rather than solely logical. He theorized that there are actually two ways of knowing the world – acquaintance (spoons) and description (the class of spoons), a type of second hand knowledge. From this it follows that there are then two types of description – the description about a description being of a higher order than the description it is about.

During his early years Russell, like Frege, found it necessary to accept the existence of Platonic ideas – that there exists concepts independent of our thoughts or of their expression in sentences. He went beyond Frege by extending this principle to concepts other than relations and numbers. He believed that even imaginary objects had some kind of being. By the time he had written *Principia Mathematica* he had changed his mind; he found that he had to give meaning to expressions that were vacuous. In his article *On Denoting* published in 1905, he worked out a general theory of denotation. He stated that

The subject of denoting is of very great importance, not only in logic and mathematics, but also in theory of knowledge. For example, we know that the centre of mass of the Solar System at a definite instant is some definite point, and we can affirm a number of propositions about it; but we have no immediate *acquaintance* with this point, which is only known to us by description. The distinction between *acquaintance* and *knowledge about* is the distinction between the things we have presentations of, and the things we only reach by means of denoting phrases. It often happens that we know that a certain phrase denotes unambiguously, although we have no acquaintance with what it denotes, this occurs in the above case of the centre of mass. In perception we have acquaintance with objects of a more abstract logical character; but we do not necessarily have acquaintance with the objects denoted by phrases composed of words with whose meaning we are acquainted. To take a very important instance: There seems no reason to believe that we are ever acquainted with other people's minds, seeing that these are not directly perceived; hence what we know about them is obtained through denoting. All thinking has to start from

acquaintance; but it succeeds in thinking about many things with which we have no acquaintance (pp. 279-280).

The theory that Russell advocated was that “denoting phrases have no meaning in themselves, but that every proposition in whose verbal expression they occur has a meaning” (p. 280). Russell came to believe that it was a mistake to look for meaning inherent in descriptions themselves and that only the proposition in whose verbal expression they occur have meaning. In simpler terms, a sentence is meaningless without some concept of object to which it refers. More strongly stated – sentences that contain vacuous definite descriptions should be counted false.

Both Frege and Russell believed it was imperative that language should only contain expressions that have a definite sense, meaning a definite truth-value. Without a definite truth-value then inference and deduction become impossible. There could be no ‘meaningless’ sentences – only sentences that are either true or false.

Like Brentano, Russell asked whether human beings could know anything, and if so, what and how? Russell was an avid proponent of scientific methodology and its application in both science and philosophy. Russell applied scientific methodology in his use of logical analysis. He became famous for his new philosophy of logic, emphasizing the importance of modern logic for philosophical analysis. His method consisted of making and testing hypotheses. His fame can be credited to the fact that he has published a large number of books and essays on moral, social, and political topics that are written at a level and with a touch of humor that can be appreciated by the general public. He became a prophet of liberal humanism, a hero for the rationalists, and rejected the dogmas of religion and metaphysics. Yet at the same time, he spoke up for human

freedom, opposed totalitarianism, and supported social and political progress according to rational principles.

In 1908 and 1910 Russell published a series of articles on ethics. At this point in his career, he maintained that the main aim of ethics was the discovery of true propositions about virtuous and vicious conduct and that it was science unto itself. In Russell's view, actions were considered good if they produced good consequences and were bad if they produced bad consequences. If this is the case then, Russell surmised, some things must be good in themselves; but not all things are good, if they were we would not be able to distinguish between right and wrong actions. He claimed that genuine differences of opinion arise not so much in terms of intrinsic goodness and badness but in regard to the rightness and wrongness of actions. People may be in agreement about the ends and yet differ on the means.

Russell carried his ethical philosophy into his *Principles of Social Reconstruction* (1916); in this publication Russell tends toward interpretation of morality in light of anthropology and human nature. He claims that all human activity arises from two sources: impulse and desire. The suppression of impulses by purpose, desire, and will results in the suppression of one's vitality. The expression of natural impulse is in and of itself a good thing because of man's natural central tendency toward growth. But, if we follow impulse alone we remain in bondage to it and lose the ability to control our environment in a constructive manner. It is the mind that provides the control, the impersonal objective thought, that enables us to decide what impulses need to be suppressed or diverted. So, although he advocates vitality of life he does not give full approval to all impulse. To impulse and desire, Russell adds instinct, mind, and spirit. He

credits instinct as the source of vitality with mind as a means of control. He considered the spirit the impersonal feelings that enable us to transcend personal interest in favor of interest in other people's joys and sorrows.

Russell was appalled by the outbreak of World War I and the accompanying 'war spirit'. He was dismayed by the nationalistic fanaticism displayed during the war. He devoted his energy during the war to fight for a negotiated peace. For his efforts, he was dismissed from Trinity College at Cambridge, his freedom of movement within Britain was restricted and he was banned from going to the United States. In 1918 his actions led to his arrest and five-month imprisonment. He became an advocate of the Guild Socialism. He did not return to the study of philosophy until after the war (Copleston, 1967; Irvine, 2004; Kenny, 1998; Russell, 1948; Scruton, 1995; Watson, 2001)

American Sociology and Political Theory

Weber represents the new type of social scientist who, unlike Herbert Spencer, argued that cooperation rather than survival of the fittest was the key to the preservation of species in nature. On most of the Continent, Weber's rational-empirical approach to sociology was rejected. His approach was accepted in Britain, the United States, and Scandinavia where sociology and political theory were more inductive and pragmatic. Lester Ward (1841-1913), an American master of many areas of study, including sociology, adopted a nonsocialist approach much like Weber's. Although Ward was an evolutionist he launched a counterattack of the methods, conclusions, and ethics of the Spencerian Darwinists.

Ward was a fervent opponent of slavery and enlisted in the Union Army during the American Civil War in 1862, serving until 1863, when he was discharged due to

wounds he received at the Battle of Chancellorsville. In 1867 he received a position at the U.S. Bureau of Statistics and came to view the Bureau as a model for all 'scientific lawmaking'. While in Washington, he struck up a friendship with Major John Wesley Powell, head of the U.S. Geological and Geographical Survey, obtaining a post there as the chief paleobotanist in 1881. He became a world-renowned author with the publication of *Dynamic Sociology* (1883); *Psychic Factors in Civilization* (1893), *Outlines of Sociology* (1898), *Pure Sociology* (1903), and *Applied Sociology* (1906). In 1903 he was awarded France's highest award in education, the honorary degree of Officer of Education. At the time he was also serving as the president of the International Institute of Sociology. In 1905 he became the first president of the American Sociological Society. After retiring from the federal government Ward accepted the newly created chair of sociology at Brown University, where he served until his death in 1913.

Ward considered himself, like many of his pragmatic American counterparts, a materialist. The only reality was matter, which was imbued with a cosmic energy, of which human activity was only a part. He believed that only science could provide insight on the workings of the universe of which man's thoughts and actions were a part. He rejected all supernatural explanations of the universe, including religion, considering it a barrier to scientific progress. Yet he held religious impetus in high regard and saw science as a form of quasi-religion, and saw the eternal driving forces of nature as the source of both religion and science. He believed that man was able to meld with and control the evolutionary process and he sought to construct a comprehensive sociology that would assist in the improvement of the human condition. He promoted a strong social science over social Darwinism.

In his book *Dynamic Sociology*, Ward argued that sociology is not a branch of biology, but is in fact a separate field of study that requires rational-empirical investigation. He claimed that the speculative deductions drawn from Darwinian biology were wrong and represent an abuse of scientific methodology. In his estimation the Spencerian Darwinists had used evolution to justify social oppression, the elimination of the morally best in society, and a resignation to a purposeless cosmic law. They had confused organic evolution with social evolution. The propagation of a species is genetic and based on the unplanned, involuntary, automatic, and mechanical operations of nature. The history of civilization demonstrated the successful human intervention in the natural process of organic evolution. The development of civilization required voluntary action that was planned, rational, and dynamic.

Ward developed a theory of planned progress called Telesis, whereby man, through education and development of intellect, could direct social evolution. By modifying natural selection, man could improve his condition. This theory was in direct opposition to Spencerian Darwinism. Ward's American counterpart to Herbert Spencer was William Graham Sumner, who saw social progress as a natural result of the forces of evolution and was therefore unplanned and uncontrolled. From the perspective of Social Darwinists, the role of the sociologist was to observe and study society. But Ward was not content to restrain his sociology to the passive study of society. He believed that the existence of the human mind made society radically different from the rest of nature. Human intelligence may be the product of evolution, but once gained it allowed humans to alter their condition in a planned and purposeful way. Ward believed that humans lacked the knowledge to change their condition before the advent of modern science.

Science provided the basis of knowledge required to change the natural course of evolution.

Ward's conclusions and theories supported the new social gospel that preached a message of universal education and social reform. At odds with both religion and social Darwinism, the new sociology promoted altruism over individualism as a means for man to conquer nature. The new sociology was eagerly embraced by a new generation of empirical economists and pragmatists who preferred activism over contemplative ideology. The new sociology was also a critical factor in the wave of progressive legislation and constitutional changes that moved through the American government in the first decades of the twentieth century (Faragher, Buhle, Czitrom, & Armitage, 2000; Sniegowski, 1996; Stipp, Dirrim, & Hollister, 1972).

Philosopher John Dewey held views very similar to Ward's. He criticized what he considered to be the excessively rigid and formal approach to education found in most American schools. Dewey advocated the inculcation of what he called 'creative intelligence' in students. In books such as *The School and Society* (1899) and *Democracy and Education* (1916) Dewey advocated that schools should be 'embryonic communities' or miniature societies where children were encouraged to actively participate in different types of experiences. He believed that cultivation of the imagination and openness to new experiences developed habits in students that would prepare them to be useful citizens in the new economy. His belief in education as the fundamental method of social progress has inspired generations of progressive educators (Faragher, Buhle, Czitrom, & Armitage, 2000; Van Wesep, 1960).

European Sociology and Political Theory

Lester Frank Ward's conclusions regarding sociology were not popular in Continental Europe. His empirically based approach to the study of civilization was contrary to German Idealism and European Romanticism, both of which were still prevalent in European thought. Romantics of the nineteenth century provided evidence that social environment, cultural myths, and unconscious motivation rather than reason were the dominating factors affecting social life. German idealist philosophers, most notably Wilhelm Dilthey (1833-1911) and Edmund Husserl (1859-1938), concluded that the social sciences were subjective and that the writing of history was itself a subjective experience affected by the ideals or traditional values of the historian.

The effect was an acknowledgement by social scientists of the irrational in human society. At the same time, social scientists reasserted the validity of empiricism and reason as tools of social analysis. The combination of empiricism, reason, and Romantic ideals opened the door to a revision of the premises upon which political thought had been based. Late nineteenth and early twentieth century anthropologists and sociologists denied the eighteenth-century myth of the 'noble savage' who had been used as a demonstration of the universality of natural laws. Instead of being an unrestricted natural man, the 'primitive savage' was found to be constrained by numerous customs, myths, and taboos.

The myths and rites of primitive people were studied. Scientists formulated new theories about the role of myths and tribal rites. For example, Edward Taylor (1832-1917) a professor of anthropology at Oxford, claimed there was nothing other than material differences between the myths of primitive and civilized man. Scholars debated

the origins and function of myths but most agreed they were persistent elements of society. Georges Sorel (1847-1922), a French engineer and a self-trained sociologist, brought together anthropology and sociology in an effort to create and embed new emotionally satisfying myths as a means to unite the revolutionary proletariat. Sorel was a primary popularizer of the general strike. In his *Reflection on Violence* (1908) Sorel declared the general strike the most effective weapon of disorganization.

The new sociology, divorced of physical and biological analogies, undermined the basic premise of classical liberalism and socialism that man acts in congruence with the rational self-interest of the individual or class. Weber supported an empirical approach to sociology and favored the rational humanitarian values of the Enlightenment. He popularized 'ideal types' – models abstracted from social and political experience – and their use as an analytical tool to display empirical data. He avoided the contrast of materialism and idealism that was characteristic of his German environment. He did find some elements of value in Marxism. He concluded that western civilization differed from others because of its rationalism in law, thought, science, and industrial organization. His conclusions supported the then unpopular values of the Enlightenment (Faragher, Buhle, Czitrom, & Armitage, 2000; Van Wesep, 1960).

Marxism and the New Sociology

Marx's sociology produced a new generation of sociological thinkers. Marx's philosophy is of lasting value due to his attempt to merge the Hegelian vision of consciousness with an empirical approach to economics. His theories were adopted, expanded upon, and widely published by Werner Sombart. In 1896 Sombart, a professor at the University of Breslau, published a book titled *Socialism and the Social Movement*

in the Nineteenth Century. The book was a huge success; within five years it went through four editions in Germany and was translated into eleven different languages. The American edition was published in 1898 and included a forward by John Bates Clark, a professor of political economy at Columbia University, who supported Sombart's theory that socialism was the product of a natural evolution in a capitalist society.

The fifth edition of Sombart's book, published in 1905, was translated into seventeen different languages, was two-and-a-half times longer than the first, and included a detailed history of the socialist movement in Germany, France, and England. Sombart agreed with Marx that there is an inevitable material force that moves capitalism toward uniformity and socialism. The unexplained puzzle was the lack of socialism within the United States.

Sombart (who never visited the United States) published a book in 1906 titled *Why Is There No Socialism in the United States?* In his research Sombart relied on literature and statistics and theorized that the American political system, the high standard of living, and the expectations of social mobility had in essence 'bought off' the American worker. Despite the empirical evidence, however, Sombart went on to support Marx's theories and claimed (using Newton's terminology) that 'the laws of motion' of capitalism would apply to all capitalist societies such that the inevitable class divisions would lead to a polarization of society. The polarization of society would then result in the development of a socialist movement, which would ultimately force the political and economic systems into a socialist system (Bell, 2000).

Sombart may have asked the wrong question. There was a socialist movement in the United States. Unlike European nations, however, the socialist movement did not

target political power or the social system; it targeted the American corporate system.

Between 1897 and 1904 union membership grew from less than 500,000 to more than 1.7 million. In 1905 leaders of the Western Federation of Miners (WFM), the Socialist Party, and other radical groups founded the Industrial Workers of the World (IWW). The IWW charter proclaimed “The working class and the employing class have nothing in common...Between these two classes a struggle must go on until the workers of the world unite as a class, take possession of the earth and the machinery of production, and abolish the wage system” (Faragher, Buhle, Czitrom, & Armitage, 2000, p. 628).

The IWW made a significant impact in the US. During the 1910s the cause of the IWW was adopted in a small, but influential community of artists, writers, social workers, lawyers, and political activists in Greenwich Village, New York. The community shared a deep sympathy for the struggles of labor, had a passion for modern art, and was open to socialism and anarchy. These cultural radicals challenged conservative ideals, rejected traditional marriage and gender roles, advocated birth control, and supported the growing feminist movement. Although the IWW ceased to exist, their platform was absorbed into the political platforms within the US (Faragher, Buhle, Czitrom, & Armitage, 2000).

ACT FOUR

Scene 3

MINERVA: While philosophers and political theorists were debating the merits of various systems of thought and Einstein pursued his quest for an all-embracing General Theory of Relativity, the world order went awry.

BILL: You mean World War I?

MINERVA: Yes. War was not a realistic thought in anyone's mind.

ADAM: How can we possibly have a world war without somebody intending it to happen?

MINERVA: I think, using Einstein's space-time continuum as an analogy, the combination of time, space, and matter created a gravitational pull that brought everything together.

ADAM: Alright, Minerva – you're out there a little far for even me!

MINERVA: Let me explain...

World War I came as a shock to many highly intelligent people. There had been no armed conflict between the great world powers for over forty years. Wars were fought outside of Europe. In an effort to end all armed conflict, the world powers established the Hague Court in 1899 as a venue for countries to settle disagreements and to avoid armed conflict. By 1914 the court had settled at least eighteen important cases and a number of lesser ones. Pacifists believed that the world had finally outgrown war. The rise of business in the nineteenth century created interdependence that they believed inhibited the threat of war. Nations could no longer exist in economic isolation. Pacifists believed that foreign investments and international credit and exchange promoted mutual confidence among nations. Intellectual exchange among university professors and students accompanied with the spread of scientific discoveries helped to establish a world with a common cultural background. Intellectuals and men of eminence believed that the nineteenth and twentieth centuries had gone far toward the development of a world

community with an increasing homogeneity of ideas and ideals. Nations had even joined together to create international systems of communication, postal service, patent laws, copyright laws, and agreement on the use of the metric system of weights and measures.

People seemed to understand their interdependence and joined together in non-governmental efforts. Beginning in 1881 the Catholic Church held a series of Eucharist congresses that were hosted in different parts of the world. Protestants also convened world gatherings that brought together people from all over the world. In 1889 both the Socialists and the Parliamentary Union organized meetings in an effort to spread each of their ideas around the globe. The Rotary Club and the Boy Scouts had worldwide membership. By 1914 there were over thirty different international scientific organizations. And by 1914 there were also more than 160 different peace organizations around the world.

Unfortunately, the deeply ingrained spirit of competitive nationalism seemed to be stronger than the recently engendered ideal of world peace. There were few if any rules, and no real system in place to govern international relations. Nations, in effect, conducted their international affairs in a state of anarchy. Every European state considered itself sovereign and did not recognize any authority higher than its own. Complicating this environment was the rise in business that pacifists believed would inhibit war. The rise in business also gave rise to imperialism as each nation rivaled to gain a larger portion of the world's assets. In a world of imperialistic rivalry, there were any number of opportunities for conflict.

In the spirit of imperialism, Austria-Hungary sought to incorporate the Balkans in order to stop the Serbian anti-Hapsburg rhetoric. Germany was in favor of Austria-

Hungary's efforts since that would open up the way for Germany to build a railroad through friendly territory into Asia-Minor. Italy, France, and Britain each had their own plans for expansion. Imperialistic tendencies set up conflicting aspirations amongst the major European powers, creating an atmosphere of mutual fears and suspicions. Adding to the climate were the national alliances, each supposedly entered into for the purpose of maintaining peace. The result was that by 1914 Europe was divided into two rival groups, each heavily armed and ambitious.

On June 28, 1914 Archduke Franz Ferdinand of Austro-Hungary and his wife were assassinated in Sarajevo. His assassination was the work of Serbian conspirators who wanted to stop his plans to peacefully settle the Serbian/Bosnian conflict. In a series of earlier alliances, Germany was allied with Austro-Hungary; Serbia was allied with Russia, to whom it appealed for support. As a result of Serbia's appeal to Russia, Germany mobilized its forces. A month after the war started, J.J. Thomson, who discovered the electron and was appointed soon after as the president of the Royal Society, was one of the many eminent men who signed a plea that England not go to war against Germany. Unfortunately, in early August 1914 Russia invaded East Prussia and on the same day Germany occupied Luxembourg. On August 4 Germany declared war on France (an ally of Russia), and Britain declared war on Germany. It appeared that without any clear intent the world had stumbled into a general conflict.

The cost in human lives during the war was staggering. The toll on human life was so horrific that the British army was forced to continually lower its height requirement from five feet eight in August 1914 to five feet five on October 11. There were thirty thousand casualties in October – on November 5 they lowered the height

requirement to five feet three and a request was issued for 300,000 volunteers. By early 1916 there were no more volunteers and the British were forced to install their first conscription into the army. General Douglas Haig, commander in chief of the British forces, used the new troops to launch a massive offensive. He viewed the new conscripts as the lowest form of life, incapable of doing more than following the most obvious and simplest of instruction (an example of Spencerian Darwinism at its worst). The attack lacked any form of surprise. Following a week of bombing, Haig ordered 110,000 British troops to attack along a thirteen-mile front of the Somme. Over 60,000 men were killed or wounded on the first day. The battle raged until November 18 when weather finally ended the battle. The final death count from this single front was 445,322 German casualties and another 419,654 British casualties. To the general public, the Allied drive on the Somme seemed a failure – the Allies had gained only 120 square miles of territory. The military forces, however, felt they had gained their objective – an acute attrition of German forces (Watson, 2001)

The war took an enormous toll on the entire European population and created a sense of disillusionment that was supported by the prevailing philosophies initiated by Darwinian theory. The unprecedented slaughter, brutality, and cruelty displayed during the war appalled all combatants. In 1915, early in the war, Freud published an article titled *Thoughts for the Times on War and Death*. In the paper Freud described the disillusionment felt by the people of the world, who had come to believe that man had finally overcome uncivilized behavior. By the end of the war, over 24 million Europeans and more than 100,000 Americans were killed in battle or died from influenza and pneumonia (Van Doren, 1991; Faragher, Buhle, Czitrom & Armitage, 2000).

The US joined the war in 1917 after a threat of alliance between Germany and Mexico. President Wilson declared the war a great moral crusade – one in which the US would defend democracy, spread liberal principles, and redeem Europe from its decadence and militarism. Reformers throughout the US saw the war as a positive force for social change. War required greater involvement of the government in every phase of American life. John Dewey believed that war offered great social possibilities for the improvement of social welfare through science and improved efficiency (Dewey, 1916; Faragher, Buhle, Czitrom & Armitage, 2000).

The US was immediately faced with the issues of managing a large force. In April of 1917, when war was declared, the U.S. military numbered 200,000. By the end of the war in 1918, the military had expanded to include over five million men and women. The Army activated all the tools at their disposal, from reform measures involving education, alcohol, and sex, to the administration of the new Stanford-Binet intelligence test. For America, the war experience started some important and lasting trends in organizational life (Kenny, 1998).

Civilization was forever changed following WWI; Europe never returned to the same type of civilized behavior that existed before the war. It was as if society in general had lost its sense of innocence. Germans, who had idealized themselves as the epitome of a civilized, intellectual society, saw the world turn against them and describe them as barbarians. Freud explained the cause of the war, not in political terms, but in terms of human nature. Men, according to Freud, need war in order to shed the intolerable burden of civilization. In his estimation, neuroses developed as a result of man's conflict of his

deep-seated desires and societal norms. He claimed that war brought out the worst and the best in men (Ritter, 1921; Van Doren, 1986).

Many of the intellectual consequences of the war were indirect and emerged over the following years. The brutality and carnage of the war and the inequities in the armistice all became ingrained in the mentality of the age. The Russian Revolution, which took place in the middle of the war, brought about its own changes that affected eastern Europe and the rest of the world for the next seventy years.

World War I also devastated the world economy and disrupted the boundaries of empires and nations. The Ottoman, Russian, and Austro-Hungarian empires were devastated. Germany was in ruins, Russia was caught in a wave of revolution, and the British and French economies required an infusion of U.S. capital to remain solvent. The war validated the philosophy and theories of Nietzsche and Freud – the world was governed by irrational motives. The Enlightenment goals of universal laws, reason, and the hopes inherent in the belief in the evolution of man were destroyed. The war demonstrated that the divisions between people based on culture, language, nationalism, and inequality of progress were so deep that any of the unifying concepts of Enlightenment philosophy and science were incapable of bridging the gaps. Rationalism had failed (Chatterjee, Gould, Martin, Riley, & Wasserstrom, 2002; Watson, 2001).

ACT FOUR

Scene 4

MINERVA: So, you see, Adam, the combination of single events produced a force that created a path that led to the war. It was, for all practical purposes, unavoidable.

BILL: Gee, Minerva, and I didn't think you were a Calvinist!

MINERVA: The question, Bill, was Calvin right, that God predestined events, or that the events create a force that draws us forward on the space-time continuum, creating events that appear to be pre-destined?

LINDA: Wow, you guys. Take a break. You're moving too fast for me.

BILL: You think this is weird – you should hear how bizarre philosophy gets when they started getting into whether the things we think about are real or not. We can complicate even the easiest stuff.

MINERVA: Bill is talking about a movement of thought that tackled that concept of language. After WWI people went back to search for meaning in life; in Europe that search played out in debates about what is real. The philosophy of Wittgenstein kicked off several decades of debate...

The Philosophy of Wittgenstein

Ludwig Wittgenstein (1889-1951), born in Vienna, was the son of a Jewish steel millionaire and a Catholic mother. He and his eight siblings were all baptized into the Catholic faith. He attended the *Realshule* in Linz, where he was a contemporary of Adolf Hitler. At school he came under the influence of Schopenhauer's idealism and lost his faith. After studying engineering at Berlin and Manchester, he took the advice of Gottlob Frege and went to Cambridge where his genius was recognized by Bertrand Russell. Russell mentored Wittgenstein, helping him to foster his intellect.

After five terms at Cambridge, Wittgenstein moved to an isolated cabin in Norway sequestering himself from the outside world. When the war broke out in 1914, he

enlisted in the Austrian artillery. While serving with valor, he wrote his *Tractatus Logico-Philosophicus*. He was captured and during his captivity in 1918 at Monte Cassino, he sent his manuscript to Russell. The book was published in German in 1921 and was soon published again in German and English with an introduction by Russell. The *Tractatus* was the only book Wittgenstein wrote that was published in his lifetime.

It was Wittgenstein's opinion that the *Tractatus* solved all the problems of philosophy. He wrote the book in the form of a series of aphorisms, each with comments. Some of the sections contained no more than a single sentence. The first and last paragraphs are indicative of the contents: "The world is all that is the case" and "Whereof one cannot speak, thereof one must be silent" (as cited in Kenny, 1998, p. 331). In *Tractatus*, Wittgenstein addressed the problem of the relationship between ideas as they were expressed in language, and the actual states-of-affairs in the world. He addressed the problem through his 'picture theory' of language.

According to Wittgenstein, thoughts and propositions are pictures in a literal sense. Even metaphors, which do not look like pictures (such as 'blood is thicker than water'), are pictures; the problem is that language disguises pictures in thought beyond recognition. He claimed there must be something in any picture that it holds in common with that which it depicts. This shared minimum is what Wittgenstein called its logical form; every proposition must also have logical form in common with what it depicts.

Wittgenstein extended Russell's theory of descriptions to language where language 'symbols' were used as a definite description of complex objects. Using this approach, any sentence can be analyzed in accordance with the theory of descriptions. Wittgenstein believed that if we proceed to analyze a proposition, we will come in the

end to a set of symbols which denote entirely non-complex objects; a long combination of atomic propositions. These atomic propositions will each contain names of simple objects – names that relate to each other in ways that provide either a true or false relation between the objects they represent. The human mind does not actually fully analyze a proposition in this manner – the thought expressed by the proposition already contains the complexity of the fully analyzed proposition and is related to its expression in ordinary language through a series of complicated unconscious rules.

Within the *Tractatus*, Wittgenstein used logical techniques to demonstrate how the truth-value of scientific propositions depend on the truth-value of the atomic propositions from which they were built up. However, Wittgenstein claimed that the propositions of logic are tautologies, an endless repetition that is incapable of analysis into atomic propositions and are therefore pseudo-propositions that yield no pictures of the world. This being the case, then the implications for science and philosophy are significant – no empirical statement can necessarily be true. Using this logic, Wittgenstein argued that neither science nor philosophy can show us the meaning of life. Both metaphysicians and scientists attempt to describe the logical form of the world, but this is impossible. A picture must be independent of what it pictures. What metaphysicians attempt to say cannot be said, it can only be shown. Philosophy, therefore, is not a theory – it is an activity of clarifying non-philosophical propositions that will then show what the philosopher wishes to, but cannot, say. Having fully addressed, in his opinion, the subject of philosophy, Wittgenstein retired from the subject (Copleston, 1994; Kenny, 1998; Oldroyd, 1986).

After WWI Wittgenstein worked for several years as an elementary school teacher in Austria. When his career as a school teacher came to an end, he once again took up the study of philosophy and for a short while took part in the discussions of the Vienna Circle. In 1929 he returned to Cambridge, submitted the *Tractatus* as a Ph.D. dissertation and was awarded a fellowship to teach at Trinity College. During the 1930s he became one of the most influential teachers of philosophy in Britain. During the Second World War he served as a hospital porter in London and a research technician in Newcastle. After WWII he returned to the university to teach until 1947 when he retired in order to pursue writing. He spent his last years living alone in Ireland or with friends in Oxford, Cambridge, and Ithaca, New York. He died in 1951, his remaining work, including his *Philosophical Investigations*, were published posthumously.

While teaching at Cambridge, Wittgenstein dictated the “Blue Book” to his class during the 1933-34 session. He dictated the “Brown Book” to two of his students during 1934-35. He did not title the books as such; their names derived from the fact that the first set was bound in blue wrappers and the second in brown. Both books speak to language games. He referred to language in mathematical terms and spoke of operating with ‘signs’.

In the *Blue and Brown Books*, as well as his *Philosophical Investigations*, Wittgenstein abandoned the logical atomism of his *Tractatus*. In its place he adopted the premise that there are no simple elements of language and that the words ‘simple’ and ‘complex’ have no absolute meaning. All language must be interpreted in terms of context. He believed that grammatical structure concealed the true nature of language and that language functions as a social, interpersonal activity. He came to believe that in the

Tractatus he, like other philosophers, had grossly over simplified the relation of language to the world. He begins his *Blue Book* with the question: “What is the meaning of a word?” (p.1). Rather than taking the simple route of denotation as he did in the *Tractatus*, taking the word to an atomic level, he now replies to the question as such:

Let us attack this question by asking, first, what is an explanation of the meaning of a word; what does the explanation of a word look like?...Asking first ‘What’s an explanation of meaning?’ has two advantages. You in a sense bring the question ‘what is meaning?’ down to earth. For, surely, to understand the meaning of ‘meaning’ you ought also to understand the meaning of ‘explanation of meaning.’ Roughly: ‘let’s ask what the explanation of meaning is, for whatever that explains will be the meaning.’ Studying the grammar of the expression ‘explanation of meaning’ will teach you something about the grammar of the word ‘meaning’ and will cure you of the temptation to look about you for some object which you might call ‘the meaning’ (Wittgenstein, 1960, p. 1).

The challenge of representation that Wittgenstein placed before philosophers and scientists stirred a new debate. There was no longer a sense of absolutes. Prior to his work there existed a sense that there was a scientific language that was anchored in reality.

Our knowledge was seen to be an attempt to grasp or capture that reality, and language was the medium through which that capturing occurred. The crisis of representation has occurred because it is no longer believed that signs or language more generally have the ability adequately to reflect that reality. Rather, they are now seen to be both arbitrary and volatile (Curry, 1991, p. 215).

Wittgenstein introduced an uncertainty into the language of science, a new sense of relativity. Nothing is concrete – everything is relative. His philosophy made a dramatic impact on twentieth century thought, and was adopted immediately as a topic of debate amongst the members of the Vienna Circle (Copleston, 1994; Curry, 1991; Kenny, 1998; Rhees, 1960).

The Vienna Circle

Einstein was held up as a model scientists by a group of philosophers who gathered together for a Thursday evening discussion group in Vienna in 1922. The discussion group was formed by Moritz Schlick (1882-1936), a theoretical physicist and philosopher who held a chair in the philosophy of the inductive sciences in Vienna. Other members of the group were Alfred Ayer (philosopher), Gustav Bergman (mathematician), Rudolph Carnap (philosopher and logician), Herbert Feigl (philosopher), Philipp Frank (physicist), Kurt Godel (mathematician and logician), Hans Hahn (mathematician), Felix Kaufmann (lawyer), Victor Kraft (historian and philosopher), Karl Menger (mathematician), Otto Neurath (sociologist), Kurt Reidemeister (mathematician), Friedrich Waismann (philosopher), and Edgar Zilsel (philosopher). Karl Popper and Wittgenstein were both living in Vienna at the time the group formed and met, but neither participated. Both did, however, have private discussions with various members of the group.

Later referred to as the Vienna Circle, this small group of men closely studied the early philosophies of Wittgenstein. They discussed his basic tenet that philosophy is not a science, or body of doctrine, it is an activity. They were also intrigued by Wittgenstein's view of logic; that logic "*made possible* the representation of the world in thought, the thoughts being expressed through the symbolism of language. But the propositions of logic did not *themselves* represent the world" (Oldroyd, 1986, p. 223). For Wittgenstein, logic could reveal what is possible, but did not determine how the world is structured. Einstein, with his use of logic and mathematics represented the actuality of Wittgenstein's premise about logic.

The Vienna Circle promoted a philosophy that was later coined as logical positivism or logical empiricism. The goal of the members of the Circle was to develop a philosophy of science that combined logic and the epistemology of empiricism – creating a philosophy of science that would eliminate all metaphysics, thereby establishing a unified science. The means they used to accomplish this goal was to clarify the meaning of language with the help of logical analysis. They held that the role of philosophy was not to produce propositions that were true or false, but to clarify the meaning of statements and categorize them as either scientific (factual), mathematical (logical), or nonsensical (in which they grouped all metaphysical statements, including moral and ethical statements) (Oldroyd, 1986; Popkin & Stroll, 1993).

In 1931 A.E. Blumberg and Herbert Feigl coined the name ‘logical positivism’ to describe the general philosophical position of the members of the Circle. In fact, the logical positivists denied that they were doing philosophy at all – and if they were it was a new philosophy they referred to as ‘scientific philosophy’, one free of the ‘nonsense’ of metaphysical philosophy.

The Vienna Circle was very active in promoting logical positivism. Several congresses on epistemology and the philosophy of science were organized with the assistance of the Berlin Circle. Congresses were held in Prague (1929), Königsberg (1930), Prague (1934), Paris (1935), Copenhagen (1936), Paris (1937), Cambridge, England (1938), and Cambridge, Mass. (1939). Significant work was presented at each of the congresses; for example, in Königsberg (1930) K. Gödel announced that he had proven the completeness of first order of logic and the incompleteness of arithmetic; the Copenhagen (1936) congress was dedicated to the new field of quantum physics and

causality. Between 1928 and 1937 members of the Circle were involved in publishing dozens of works, including the first book written by Karl Popper titled *Logic der Forschung* (1935), the establishment of a new journal, *Erkenntnis*, which became well known, and a series called the *International Encyclopedia of Unified Science* (Murzi, 2004; Oldroyd, 1986).

In particular, the members of the Circle claimed that their ‘verification principle’ was derived from Wittgenstein’s work. The principle of verifiability was the basis of the logical positivist rejection of metaphysics. The principle stated that “the meaning of a proposition is equivalent to its method of verification...only two kinds of cognitively meaningful propositions were recognized...propositions that were analytic (in a Kantian sense) and those that were empirically verifiable” (Oldroyd, 1986, p. 232). This definition of propositions places a severe limit on the range of meaningful propositions, which the logical positivists considered strength rather than a weakness. The limitation eliminated non-verifiable propositions, such as ‘the cosmos is infinite’ and any statements of a theological character, such as ‘God exists’. According to logical positivists, the existence of God cannot be verified empirically – faith is required, not observation. In essence, the principle of verifiability excluded the entire realm of metaphysics.

Ayer claimed that all metaphysical propositions are non-sensical and that

All empirical propositions are hypotheses. And this means that none of them are conclusively verifiable. It follows that when we say that a proposition, other than a tautology, is significant if and only if it is empirically verifiable, we must be understood to be using the term ‘verifiable’ in its weakest sense. In other words, the question we must ask about every putative proposition is not ‘what observations would make its truth or falsehood logically certain?’ but simply ‘what observations would lead us to allow or deny it a place in our system of accepted propositions pending the production of further evidence?’ It is because no answer can

be given to these questions, in the case of metaphysical assertions, that these assertions are held to be meaningless (Ayer, 1934, p. 345).

There ensued a great deal of discussion in philosophical literature as to the adequacy of the verification principle. Stace (1935) argued against the philosophy of logical positivism, claiming that

the new theory of meaning threatens violent revolution over the whole domain of philosophy. For if the theory be accepted, a great deal of philosophy of the past is simply blown up. Philosophers have always been accustomed to hear from their opponents that their conceptions were false, their arguments fallacious. But they have retained at least the right to defend themselves, to retort on their opponents, if they could. But now they are to have no right to open their mouths at all. For whatever they say, whatever opinions they believe themselves to be advocating, they are to be told that they are merely uttering nonsensical noises. In these circumstances linguistic analysis may remain, and this may be called philosophy if you like. But any other kind of philosophy must simply disappear. Thus the new theory constitutes perhaps the gravest challenge which philosophy has ever had to face (p. 419).

To Stace's argument about the dangers of logical positivism, Ayer (1936) responded

Prof. Stace has over-emphasized the destructive element in logical positivism. We do not maintain that philosophy should 'entirely shut up shop'. For, when metaphysics is eliminated analysis remains. And we claim that our conception of philosophizing as an activity of analysis accords at any rate with the general practice of the majority of the great philosophers of the past (p.203).

Despite Ayer's assurances, verificationism still appeared to render meaningless all ethical propositions in that they have to be construed as nothing more than the manifestations of human beliefs and urges. Some members of the Circle actually preferred this, delegating the realm of ethics to behaviorists and sociologists.

There was more to logical positivism than the verification principle. Members of the Circle sought to give a general account of the structure of scientific theories. To this end, Rudolf Carnap (1891-1970) gave perhaps the most thoroughly developed account of

the subject. Carnap's objective was the establishment of an 'empiricist language', into which all scientific laws and theories could be translated. The new language would be exclusive of metaphysical propositions.

Carnap grew up in northwest Germany, studied mathematics and philosophy at Jena under Frege, and began a doctorate in physics, which was interrupted by the First World War. He served in the German army and after the war continued his studies at Jena, earning a doctorate. His dissertation dealt with an analysis of the concept of space.

In 1926 Carnap moved to Vienna, joined the Vienna Circle, and taught philosophy at the University. From 1931 to 1935 he taught at Prague and in 1936 moved to the University of Chicago. In 1921 Carnap read Russell's work *Our Knowledge of the External World*. Carnap aligned himself closely with empiricism, believing that all scientific knowledge is based in experience. He found that the work of Russell and Whitehead on the logical foundations of mathematics insightful in demonstrating the empirical basis of science as well as an empirical theory of knowledge. In 1925, after five years of work, Carnap finished a preliminary version of his book *Der Logische Aufbau der Welt* (*The Logical Structure of the World*), which was published in 1928. In his book Carnap laid out an account of our knowledge of the world starting from the simplest sensation and building logically to a full account of all our thoughts. Using this same approach, one could therefore give a thorough account of the empirical basis of scientific knowledge (Oldroyd, 1986).

Hans Reichenbach (1891-1953) was a leading member of the Berlin Group and a proponent of logical positivism. He was born in Hamburg into a wealthy Jewish family. He studied engineering in Stuttgart; in Berlin he studied physics, mathematics, and

philosophy. Among his teachers were philosopher Ernst Cassirer, mathematician David Hilbert, and the physicists Max Planck, Max Born, and Albert Einstein. He fought during the First World War, but still managed to earn his degree in philosophy in 1915. His dissertation on the theory of probability was published in 1916. During the years 1917-1920 in Berlin, he attended Einstein's lectures on relativity, selecting the theory of relativity for his own philosophical research. In 1920 he obtained a teaching post in Stuttgart. And in 1926, with Einstein's support, he took a chair in philosophy of physics at Berlin. Like other professors of Jewish origin, Reichenbach was dismissed from the university in 1933 by the Hitler regime; he relocated to Turkey and subsequently to the United States in 1938. He held a chair in philosophy at the University of California at Los Angeles until his death in 1953. Reichenbach was a prolific writer and a popular professor. His teaching style was easy to understand and students found him approachable.

Reichenbach claimed that all knowledge must be essentially probabilistic and that physical predictions are never exact. Mathematically, it is impossible for all relevant factors to be incorporated into the calculations. Therefore, only probabilistic calculations can be made. Reichenbach repudiated any form of Laplacian determinism. There are no exact and strictly determined events that we only know approximately. Instead, there are only probabilistic statements that future events will occur within certain limits. This, according to Reichenbach, is not a shortcoming in physics; it is simply the way the world works. We can only make predictive statements in relation to our observations, which are limited.

Like the logical positivists, Reichenbach was concerned with meaning, but he sought to deal with verification in a more pragmatic sense. Using his fundamental premise that all statements are probabilistic, then it is appropriate for the scientist to make statements that may be verifiable in the future based on new technological developments. Reichenbach and the Berlin group shared a common interest with the Viennese group in their desire to develop a language of science; however, the Berlin group preferred an empirical rather than a positivist approach to science. Despite the differences in positivism and empiricism, the two groups shared a great deal and interacted on a frequent basis. Reichenbach (1936) credited the members of the Vienna Circle with making “a great educational influence upon a wide public” (p. 143). He went on to state that during the 1920s

The idea of a scientific philosophy was making headway in Berlin. The ‘Berlin Group’ was organized, among whose members were Budislav, Herzberg, Grelling, and the author. They met in the seminars of the University of Berlin and the ‘Gesellschaft für wissenschaftliche Philosophie,’ open sessions of the latter attracting a large public of educated laymen. In line with their more concrete working-program, which demanded analysis of specific problems in science, they avoided all theoretical maxims like those set up by the Viennese school and embarked upon detailed work in logistics, physics, biology, and psychology. The central problem selected for analysis was probability and induction. Their enquiries led to a new mathematical probability, and to a solution of the problem of induction. For this purpose, a generalization of logic was developed in which the two truth-values of propositions ‘true’ and ‘false’ were replaced by a continuous scale of probability values (pp. 143-144).

Reichenbach’s group, in fact, found a weak spot in the logical positivist view. Positivism dealt with absolutes – propositions were either true or false. Although he credited them with possessing an ironclad system for verification, the underlying foundation of positivism weakened the structure. For the logical positivists “Insisting on the two-valued character of scientific propositions, means confusing the qualities of an ideal schema with

the actual structure of scientific theory and practice “(p. 159). He points out, however, that the goal of the German scientific community had never been the development of a uniform system of philosophy. Their goal was the development of a scientific language absent of ambiguity.

The use of words with ambiguous meaning is permissible for the poet, if he wants to arouse certain feelings in his auditors; but in science, and scientific philosophy as well, it must be absolutely forbidden. It seemed to us that this was overlooked by much of contemporary philosophy. We therefore set as our program the clarification of every scientific concept of the human understanding. As opposed to the era in which essays and enquiries ‘concerning human understanding,’ or ‘critiques of pure reason’ were written, we understood ‘understanding’ not in the abstract sense of a general human power, but in the concrete form of positive science; and so, our method developed into an analysis of science.

We are well aware of the fact that this scientific tendency is not confined to our German group, and that there are corresponding movements in the whole world. It has been to our advantage within the last 10 years, to engage in an active exchange of ideas based on organized discussion. In this way a certain external uniformity of character has been obtained. We hope that the time now has come to widen the field of discussion, to extend the exchange of ideas on an international level. Science, surely, is not limited to national or racial boundaries; we prefer to stand for this historical truth, in spite of all the pretensions of a certain modern nationalism. The first steps have already been taken through the establishment of relations between our group and Polish logicians, French empiricists, American pragmatists, and some isolated philosophers scattered over the world.

This paper by Reichenbach, with its idealistic perspective on the scientific community, was written in 1936 while in exile in Turkey, three years after his expulsion from Germany.

The Vienna Circle also gradually disbanded during the late 1930s, partly due to political pressure from the Nazis (some of the Circle’s members were Jewish and the group tended toward left-wing politics) and partly due to differences in philosophy that began to emerge within the group. The philosophies of this group became widespread as

members took positions throughout Europe and the United States. Of the members of the Circle, Schlick, Feigl, Carnap, Frank, Hempel, and Godel all immigrated to the US taking positions at various universities. American pragmatists eagerly adopted both logical positivism and logical empiricism. The two, especially the latter, fit well with the pragmatic view that “ideas are meaningful or valuable only insofar as they have practical consequences in concrete human experience” (Vescio, 2003, p. IX).

The British philosopher Alfred J. Ayer (1910-1989) also popularized the philosophy of the Vienna Circle in England. Ayer focused on logic and language, adopting and adapting the logical positivism of the Vienna Circle and renaming it logical empiricism.

Ayer made attacks on philosophy, denying the existence of metaphysics. He claimed that

any attempt to describe the nature or even to assert the existence of something lying beyond the reach of empirical observation must consist in the enunciation of pseudo-propositions, a pseudo-proposition being a series of words that may seem to have the structure of a sentence but is in fact meaningless (Ayer, 1934, p. 335).

Although Ayer later denounced much of his early work on the logic of language, he played a significant role in shaping public sentiment in England through much of the twentieth century.

Science and Culture in Post War America

The economy and productivity of Europe was devastated by the war; as a result Americans shared unevenly in postwar prosperity. During the 1920s America went through a second Industrial Revolution. Electricity replaced steam power. New technology utilizing electrical power replaced old equipment. Newer machinery was

more efficient. The advent of electricity resulted in a boom for the machine industry, the construction industry, and an increase in wages. Diversification during the war moved American corporations into new industries, including consumer goods (Zeleny, 1928; Faragher, Buhle, Czitrom & Armitage, 2000).

Consumerism provided the impetus for new types of communication. Science came to the call. Ambitious inventors and investors refined the radio and the movie industry. By 1914 there were about 18,000 movie houses in the US, with over 7 million daily admissions. The first public radio broadcasts began in 1920; by 1923 nearly 600 radio stations were licensed and over 600,000 Americans had purchased radios, and by 1929 radios were in ninety percent of American homes. America was now tuned in to the latest events, fashions, and stories. For millions of Americans the new media redefined what it meant to live the good life (Faragher, Buhle, Czitrom & Armitage, 2000).

The cinema added legitimacy to scientific realism. Sound and color came to the theatre in the late 1920s. The cinema reproduced the sounds, color, and supposed realities of life. On May 20, 1927 the first newsreel footage of Charles Lindbergh's take off to Paris was produced. Technology was able to replicate realism in cinematography. Cinema was able to transmit messages that could transform society at a faster rate than was possible in the past. Movies were able to create the reality they were supposedly reflecting about normal American life (Denizen, 1995).

During the 1930s the U.S. government took an active role in the organization and production of culture. As part of the New Deal, the government actively supported artists and writers. Franklin Roosevelt once declared "You can right a lot of wrongs with 'pitiless publicity'" (as cited in Faragher, Buhle, Czitrom & Armitage, 2000, p. 737).

With government subsidy, an enormous number of artists, novelists, filmmakers, photographers, and journalists documented the poverty and despair of the American people during the depression. These pictures were shared in newspapers and cinemas throughout the US. The impulse to create documentaries during the 1930s fueled the American appetite for evidence and vicarious voyeurism.

A 1934 article in the *Journal of Educational Sociology* claimed that going to the movies had become a significant American pastime, and that the highest rate of attendance was within the areas of highest congestion and poverty. The author discussed the cinema as a significant source of informal education – that it served as a “means for self-instruction in love making, dress, and etiquette” (Cressey, 1934, p. 505). Despite a period of economic depression, the “opportunity to go to the movies [was] regarded almost universally by both children and parents as the child’s natural right” (p. 505).

In spite of the depression, or maybe as a result, Americans looked to science and industry to create new solutions, to produce new jobs, and to improve the quality of life. In 1934 a group of industrialists and scientists gathered at the Century of Progress Exposition in Chicago. The presenters at the opening night included such noted men as Alfred P. Sloan, President of General Motors, Charles Kettering, Vice-President of General Motors, F.B. Jewett, President of the Bell Telephone Laboratories, W.R. Whiney, Vice-President of Research General Electric Company, Arthur Compton, physics professor at the University of Chicago, Robert Millikan and Arthur Noyes from the California Institute of Technology, John Merriam, President of the Carnegie Institution, G.H. Parker, professor of zoology at Harvard University, Raymond Pearl, professor of biology at Johns Hopkins University, J. McKeen Cattell, editor of *Science*

and *The Scientific Monthly*, Charles H. Mayo of the Mayo Clinic, and Ray Lyman Wilbur, President of Stanford University. In their opening addresses each of them expressed a hope in the promise of science. Dr. Charles Kettering, Vice-President of Research at General Motors, stated that

The whole world is now absorbed in a study of social problems. These problems were brought about largely by the war. The depression has had a lot to do with clarifying science and industry's part in these problems...The ultimate aim of all industry, science, government and sociology is for a better life – better living conditions; better health; better food; better government; better houses; in fact, for better everything. And these can come about only in proportion as our daily routine and activities conform more nearly to nature's laws, which we understand so poorly at the present time...

It is my impression, however that we are on the eve of things of an entirely different nature than the mere extension, refinement and development of our present-day scientific knowledge. I feel we have upon us in the immediate future a great change in mental attitudes toward the physical world which would bring into existence new pieces of information which will completely change our scientific view-point. It is not what we know that is so important. It is what we do not know...Each year we discover new things, which a short time ago we did not even know existed...I can not help but feel that in a very short time we are going to break loose another great piece of basic information which will keep us industrially busy for a great many years to come (Sloan, Kettering, Jewett, et. al., 1934, pp. 68-69).

Arthur Compton, a professor of physics at the University of Chicago, echoed the hope expressed by Kettering and the other attendees of the Exposition

The scientist is society's scout who goes far into nature's new territory and brings back a report of what lies there. Almost every new wave of technological advance has followed upon some important new discovery by these scientific scouts... there is no indication that our discoveries have begun to exhaust the possibilities of nature...techniques for making discoveries have been so developed, and the number of trained men carrying on scientific research has so rapidly increased that we may expect the next generation to see more great advances in science even than the last...Unless civilization utterly fails us and removes from the followers of science the means whereby research can be carried on we may confidently anticipate a continued and rapid growth of our knowledge of nature and

with that knowledge a growth of men's powers (Sloan, Kettering, Jewett, et. al., 1934, pp. 74-75).

It would appear that America was open to, and accepting of, an unwavering faith in the ability of science to resolve all social dilemmas. The dogma of religion was being replaced by the dogma of science.

ACT FOUR

Scene 5

BILL: And while everyone seemed to be willing to let science replace faith and personal accountability, we really started messing with our heads with the theories of all the psychologists!

JUSTIN: I take it you don't like scientist or psychologists.

BILL: No, I think science is fine; I think it helps us understand how God created the universe. Scientists strayed when they abandoned God – but it took a psychologist to really mess with our heads!

TONI: Hey, Bill, I go to a therapist and I think it really helps me deal with everything.

BILL: I'm sorry, Toni, I didn't mean to offend you, but most of the psychologists and psychotherapy I've known about has been questionable at best. Just why do we believe this 'expert' who thinks he or she knows how to help us sort out our problems? Most of them have been trained to use techniques. They don't apply wisdom, they just follow the cook-book on therapy and serve your brain up as the main course.

IRENE: Now, Bill, give her a little room. Sorry, Toni, our daughter Becky went to a

therapist and he managed to convince her that she had suffered as a child by being raised in a Christian home. Bill and Becky have worked things out but it caused us many years of pain.

BILL: Minerva, you seem to be more impartial. Do you know anything about the development of psychology and psycho-therapy. Maybe that will help.

MINERVA: Not a problem Bill...

Advances in the Field of Psychology 1900-1940

In the late nineteenth century, the study of psychology was formally separated from the field of philosophy by the work of several scholars, most notably William James. "Under James' leadership, the methodological, conceptual, and substantive boundaries of psychology were greatly expanded" (Vine & King, 1998, p. 266). There were several attempts made to create a narrower unified approach to psychology, all of which were rejected in pluralistic America. James rejected any all-embracing schema for the field and promoted investigation and multiple approaches to exploration. James founded the first experimental laboratory in the U.S. and exercised his influence to extend an invitation of Hugo Munsterberg (1863-1916) to join the Harvard faculty to run the laboratory.

Munsterberg was born in Danzig, East Prussia. He received his Ph.D. in 1885 while studying under Wilhelm Wundt and earned his M.D. in 1887 at the University of Heidelberg. Munsterberg accepted the invitation from Harvard and moved to the U.S. in 1892. Though Munsterberg rejected the philosophical implications of James' pragmatism, he expressed a psychology that was tuned to every day life. He argued that

psychologists should concern themselves with the issues that people faced in daily life, acquainting themselves with the world of work, school, and the courtroom. He foresaw the day when psychological experts would be used as expert witnesses in the courtroom. He was well aware of the relationship between physiological arousal and emotional processes, and believed that one day emotions could be used to detect a lie through physiological measures such as blood pressure and respiration. His work led to advancement of study in the fields of educational psychology, industrial psychology, psychotherapy, and the combination of psychology and the law.

In his 1909 text *Psychotherapy*, Munsterberg covered a broad range of topics. In it he included a discussion on the causes of emotional disorders and their treatment, including the roles of religion, physician, and the interest of the community in the treatment plan. He argued that the therapist should adapt the therapy to the special needs and abilities of the patient. For example, a patient experiencing depression might be asked to go through the physical motions of joyful expression, thereby possibly opening new channels of motor discharge. He also emphasized that the confidence of the therapist, the expectations of the patient, and the level of empathy expressed by the therapist all played crucial roles in psychotherapy.

In the final chapter of his book, Munsterberg discussed the prevention of emotional disorders. He believed that social and legal injustice leads to emotional disorder. The problem, as he saw it, was finding an appropriate middle ground between inhibition and full expression. Blocking emotional expression results in disorder. On the other hand, Munsterberg recognized that society is impossible without inhibition.

Munsterberg also believed that mental illness had a physiological basis. Munsterberg's 'action theory' defined attention in terms of the openness of nerve pathways to muscle adjustment (hence the physical 'action' of joy to treat depression). His theory made him a forerunner in the field of behaviorism. Unfortunately, his literary defense of Germany during WWI resulted in the loss of many friends and ostracism by many in the scientific community, overshadowing his many contributions to the field of psychology (Viney & King, 1998).

Meanwhile, in Vienna, Sigmund Freud was developing his theories about human behavior. Noted as the father of psychoanalysis, Freud based his theories on the discoveries in physics during the last half of the nineteenth century. Applying the concept of conservation of energy that sparked advances in thermo-dynamics (which he adopted from his colleague Hermann Helmholtz), Freud described the human personality as an energy system, possessing what he called 'psychic energy.' Accepting Darwin's theories about the origins of species, Freud denied the existence of a human soul and instead claimed that human behavior was determined by experiences that became embedded in the subconscious. His insistence that neuroses were typically of sexual origin alienated many of his colleagues. Freud did not gain popularity until he was invited in 1909 to give lectures in the United States. He traveled and lectured with Carl Jung (1875-1961), and met a number of American psychologists, including William James. Jung and Freud maintained a close friendship until 1913 when the two parted ways. Jung was interested in the paranormal. Freud opposed anything metaphysical and warned Jung to defend psychoanalysis from the "tidal mud of occultism" (Moore, 2002, p. 187). Jung also objected to Freud's obsession with the sexual basis of behavior.

In 1923 Freud published *The Ego and the Id*, in which he presented his conception of the human mind. Like Plato, he divided the mind into three areas. Plato described the three areas of the mind as wisdom, courage, and elements. Freud described the three as id (driver of basic needs), ego (conscious), and super-ego (conscience). According to Freud, a healthy person is able to keep the id and super-ego in balance; neurosis, in his estimation, is the result of an ego that is not able to balance needs (especially sexual needs) with a sense of conscience or accepted social norms (Moore, 2002).

Freud and Jung, with very different philosophies, made a significant impact on the world. One an atheist and the other exploring the paranormal: Freud supported a positivist philosophy; Jung built on the philosophy of Kant – that the human mind creates our perception of the world rather than being a passive recipient of experiences (Moore, 2002).

Freud saw himself as a hero in the history of the world in the class of Copernicus and Darwin. Copernicus had given us a *cosmological* shock by placing us on a small planet in a vast universe; Darwin gave us a *biological* shock by robbing man of his specially created status and relegating us to the animal world. Freud felt that he had created a *psychological* shock with his theory of psychoanalysis – that we cannot even know what is going on unconsciously in our own minds (Shermer, 2001).

Freud's long term impact on society was not based in his science, for though he continually insisted that he was a scientist, experimental testing has proven his theories to be without foundation. Freud's influence on society lay in his persuasive literary style. Although Freud did not speak in favor of either abstinence or licentious behavior, his

description of sexuality led to an understanding that sexual tension leads to mental illness. Forms of behavior that would have led to arrest and conviction prior to Freud were now described in terms of mental illness. Freud caused a significant shift to occur in how society views and judges behavior (Zilboorg, 1939).

The New Science – Behaviorism

The philosophical underpinnings of behaviorism can be traced back to ancient Greek atomic theory – where only atoms and the void are real. The world, as it appears, is material. Therefore, psychological processes, such as sensations and thought, are also based on material processes. Advances in neurophysiology strengthened the arguments employed by behaviorists.

Ivan Pavlov's (1849-1936) work in neurophysiology served as a springboard for behaviorism. Born in Russia, his family hoped that he would become a priest, for which he was first trained. After reading Charles Darwin, his education took a turn and he graduated in 1879 from the Medico-Chirurgical Academy with a degree in medicine. He attended the Academy not with the intent of becoming a physician, but that after obtaining the degree he could qualify for a chair in physiology. His doctoral thesis was a study of the role of cardiac nerves in circulation. In 1890 Pavlov was appointed chair of pharmacology at the Military-Medical Academy and five years later to a chair of physiology. In 1904 he won the Nobel prize for his work on digestion. In his acceptance speech he emphasized that work on conditioning would occupy the rest of his career, which it did, he spent more than fifty-four years on the study of the functions of the cerebral cortex using conditioned reflexes. Pavlov was more interested in physiology than psychology, but he did acknowledge that conditioned reflexes might explain the behavior

of psychotic people. For example, he suggested that those who withdrew from the world might do so based on a conditioned response that all stimuli in the world might result in possible injury or threat. His ideas played well into behaviorist theories (DiCarlo, 2005; Viney & King, 1998).

In 1914 psychologist John Watson (1878-1958) published a book titled *Behaviorism*, which was based on his work with animal psychology. Between 1925 and 1930 behaviorism developed into a movement that was adopted by the press and debated in both popular and scholarly journals. Stimulated by the ideas of logical positivism, Watson claimed that man was nothing more than a machine and that all human functions were based in terms of stimulus and response (Birnbaum, 1955; Casti, 1989).

By 1925 Watson was no longer employed as a university professor and turned to the world of business. Watson accepted a position as a vice-president in a prominent advertising agency – as a result, all available media was used to publicize his ideas. In one fell swoop, Watson dispensed with heredity and instincts as drivers of human development and replaced them with environmental factors. Watson proclaimed Freudian psychology to be voodoo and disparaged all areas of psychology that did not incorporate behaviorism. Behaviorism was promoted in books and magazine articles. Watson developed a mail course, showed movies, and lectured before diverse audiences.

“The idea of science in the Twenties had a certain self-generating existence. Scientific discovery had brought belief in science...So arose the paradoxical situation in which science had toppled religion but was become a gospel itself” (Birnbaum, 1957, p.19). The scientifically proven theory that human behavior is dictated by environment, especially during childhood, appealed to educators and parents. Behavioral science

appealed to business as well. Watson claimed that behaviorism provided the answers to molding good workers. He validated the idea that success in life was measured by material standards. His theory developed into a system of values that filled the void left by the outgrown beliefs of the nineteenth century. It was in the 1925 edition of *Behaviorism* that Watson postulated the notion that environment is the only significant factor in human development. During the years 1925-1928, articles by Watson filled the pages of popular magazines. In 1929 Watson endorsed a book by George Dorsey titled *Why We Behave Like Human Beings*, which became a best-seller, and even the skeptical Oliver Wendell Holmes praised its contents. Watson's theory became a pervasive American philosophy that lasted for decades; for example, in 1955, Birnbaum wrote an article on the impact Watson made on American society, in it she summarized her findings, stating that

The most pervasive influence of Behaviorism is, perhaps, one that cannot be documented except in human personality. A generation of middle-class mothers read Watson's articles in *Parents' Magazine*, *Cosmopolitan*, *Collier's*, *Harper's*, and other periodicals. An even larger group, one who had never heard of Watson, were to bring up the children according to Behaviorist principles. The U.S. Department of Labor booklet, 'Infant and Child Care,' early incorporated all the major Watsonian premises. This twenty-five cent booklet reaches an audience greater than any other government publication. Only within the last few years has the booklet modified its philosophy of rigid upbringing. Its theme for two and a half decades was the scientific manner of handling the child. Sterilization, firmness, and non-indulgence were the key words of a regimen in which the infant was fed by the clock, had to learn early that crying would not avail, and was subjected to proper habit training from birth...

The wave of reaction to this rigid child training did not occur until the early 1940s when less maladjustment was discovered among tenement children, brought up under quite unsterile conditions whose mothers indulged them at will, than among middle-class children. This led to a reevaluation of principles and a swing in the opposite direction. It was the acceptance of Freudian theory that made the new viewpoint possible. To this next generation of child psychologists, rigid and compulsive personality types were directly attributable to early strict conditioning.

Emotional insecurity in the adult was related to persistent frustration of the infant (pp. 29-30).

It was into this environment that B.F. Skinner (1904-1990) began his program of study at the Harvard Psychology Department in 1928. Skinner adopted some behaviorist concepts, but rejected the simplified stimulus, response, reward/punishment, sequence advocated by Watson and Pavlov. By 1938 Skinner developed a radical behaviorism that replaced the idea of stimulant with the idea of *operant* behavior (behavior that is acquired, shaped, and maintained by stimuli occurring after the response). He promoted the idea that human and animal behavior are shaped and reinforced according to strict laws. As a behaviorist, Skinner did not deal with psychological, physiological, or neurological bases of behavior. His focus was on the relation between an individual's actions and the consequences. Using pigeons and rats, Skinner demonstrated that an animal could learn to behave in particular ways through the use of positive and negative reinforcements following particular behaviors. Through his experiments, he developed a set of laws that are complex and sometimes counter-intuitive. For example, behavior that is only partially reinforced (inconsistently rewarded) tends to take longer to disappear when the reward is withdrawn than behavior that has been consistently rewarded.

Skinner's method of 'operant conditioning' differs from Pavlov's 'classical conditioning'. Skinner used conditioning to establish new behavior, whereas Pavlov's dogs learned to respond in an already established way to a new stimulus. With his model, Skinner sought to explain novel behavior and creativity. The role of the environment was to select behavior rather than to reward or punish. Skinner's ideas were tremendously influential and were adopted into everyday thinking. Skinner became as noted a

psychologist as Sigmund Freud; Skinner spent more than forty years teaching psychology at Harvard (Tallack, 2001).

Although the work of Watson, Skinner, and other behaviorists effectively put an end to the philosophy of the eugenicists of the early part of the century, behaviorism was, like eugenics, based on Darwinian principles. Humans, being part of the animal kingdom, were considered merely a more complex version of a chimpanzee or rat. “There was, therefore, no difficulty in relating the behavior of rats to that of humans, except in so far as one always indicated that it is necessary to take into account more variables in talking about human behaviour” (Palermo, 1971, p. 145).

Behaviorists left genetics to the geneticists, and physiology to the physiologists. Their concentration was an experimental psychology separate of the other areas of science. Although other factors might have an impact on behavior, they believed those factors were insignificant in comparison to environment as a system of reinforcement techniques.

The psychology of behaviourism was the study of stimuli and responses...any ‘looking within’ was rejected. The new empiricism of behaviourism could get along without introspection and needed to concern itself only with externally defined observable relationships measured by the same techniques as are used by all the other sciences. So characterized, behaviourism implied the additional paradigmatic characteristic that the organism is a passive receiver of stimuli which produce, in a mechanical fashion, particular responses determined by the past history of the organism (Palermo, 1971, p. 146).

The behavioral revolution transformed psychology in the US. George Miller (2003), a Harvard PhD graduate in psychology in 1940, notes that behaviorism was so pervasive that all universities had completely immersed their programs in the doctrine of behaviorism. “Perception became discrimination, memory became learning, language

became verbal behavior, intelligence became what intelligence tests *test*" (Miller, 2003, p. 141). He was educated in behaviorism and notes that he learned to "translate [his] ideas into the new jargon of behaviorism" (p. 141). For Miller, his studies in speech and hearing did not translate well into behaviorism, and the translation was often tricky. "But one's reputation as a scientist could depend on how well the trick was played" (p.141). By 1940 behaviorism was firmly entrenched in the American psyche.

Humanistic Psychologies

Humanistic psychology formed as a criticism of behaviorist and psychoanalytic approaches to psychology. While Skinner was working on operant conditioning, Abraham Maslow (1908-1970) was studying human motivation. Maslow's goal was to set forth a holistic theory and approach to human motivation. He believed that the fundamental unit in psychology was not reflex to stimuli, but was much larger – a whole rather than a part. He insisted that he was not attacking the science of behaviorism, but an attitude toward science. In 1954 Maslow, and 125 other psychologists who identified with the humanistic rejection of psychoanalysis and neobehaviorism, formed the genesis of humanistic psychology.

Maslow claimed that behaviorism approached human psychology from a reductive-analytic standpoint rather than from a holistic-analytic standpoint. In the reductive-analytic orientation scientists isolate a part for study. He advocated a holistic-analytic approach in which the scientist studies part of a whole rather than the isolated part itself.

Maslow's theory of motivation suggests that there are five sets of goals that are referred to as basic human needs, each of which must be met before the next can be

realized. The five goals, arranged in a hierarchy of needs, are: physiological, safety, love, esteem, and self-actualization. He saw his theory as consistent with the established facts of both experimental and clinical psychology, as well as the functionalism of William James and John Dewey. He also saw his theory as part of the holism of Gestalt psychology and consistent with some of the theories of Freud and Adler.

Maslow rejected Skinner's emphasis on single determinants of behavior and believed in multiple determinants. Basic physiological needs, such as hunger, thirst, and sleep must be met before an individual or a society will seek to fulfill a higher level of need. The top level of Maslow's hierarchy is the need for self-actualization, an idea that was prominent in Jung's psychology. According to Maslow, self-actualization is realized when an individual comes to realize or accomplish the potentials for which he or she is endowed, and that it is a personal, differentiated potential for each human being. Maslow proposed fifteen positive characteristics that could be identified in self-actualized people,

including a realistic and problem-centered perception of the world, a refreshing sense of spontaneity and simplicity, and a genuine acceptance of one's self as well as others...a mature, unhostile sense of humor together with a quality of detachment, and a fierce need for privacy and autonomy resulting in deep interpersonal relations with only a few friends. Nonetheless...the self-actualized person has a great need to identify with humanity...Additionally, they have a strong ethical sense and belief in democratic values that fosters resistance to the stifling effects of enculturation and obedience. Their need for creative expression and continued freshness of appreciation and wonder about the world may manifest itself in periodic mystical or *peak experiences* (Viney & King, 1998, p. 412).

Maslow cautioned against the belief that people actually ever achieve perfection. Rather, the self-actualized being presents an outlook on life that is balanced, realistic, productive, coherent, healthy, and with a forward-looking perspective.

Maslow was critical of psychology based on the study of sick people or animal models. In his view, the study of healthy people broadens the subject matter of psychology. New topic areas include love, values, mystical experiences, humor, meanings of freedom, competence, and aesthetic needs. Psychology, in other words, can focus on the positive dimensions of life.

Like Maslow and William James, Gordon Allport (1897-1967) was interested in the development of a psychology that was open to democratic methods. He was opposed to any system that uses a forced methodological approach to study. His major area of interest was the psychology of the personality. In his book *Becoming: Basic Considerations for a Psychology of Personality* (1955), Allport distinguished between the Leibnizian and Lockean traditions in psychology. The former emphasizes a proactive, goal-directed nature in human life, while the latter emphasized a mechanistic (reactive) dimension in life. Allport labeled the behaviorist psychologies of Skinner and Watson as Lockean. He preferred the Leibnizian tradition, whereby man possesses an active, intelligent, integrative, self-actualizing capacity for life, emphasizing the importance of expectation or the forward-looking nature in human beings.

Allport was concerned that the push for psychology to be scientific would result in a neglect of what it means to be human – an individual with the individual experiences that create human uniqueness and complexity. Like Maslow, Allport was deeply interested in the subject of human motivation. He believed that biological drives, learned motives, and other psychological descriptors did not adequately address the dynamic nature of human motivation. He believed that an activity could become independent of its original source of motivation and become motivating in its own right. He believed that

motivation was not just a matter of maintaining equilibrium or meeting basic biological needs, but is often oriented toward growth, risk, novelty, and adventure. In his books, Allport discussed conditions that contribute to radical changes in personality using battle experiences as an example of events that can result in such changes. Allport represents a school of thought that challenged the behaviorist and psychoanalytic traditions.

Allport wrote a preface to Viktor Frankl's (b. 1905) book *Man's Search for Meaning* (1985), in it he asked how Frankl could face life in the midst of a Nazi concentration camp. Frankl's father, mother, brother, and wife all died in camps or were sent to the ovens. Frankl lived in the midst of horrific conditions. Allport offered that one who had survived such an ordeal is worthy of our attention. The core concept in Frankl's psychology is the human need for a meaningful existence. Frankl argued that belief in the behavioral model of conditioning, or the Freudian view that human lives are simply a battleground in a war of unconscious forces, produces a sense of despair and meaninglessness. Frankl claimed that, although conditioning and suppressed urges may affect our lives, many of the problems we experience are the result of our failure to find a meaning or purpose in life.

Frankl called the neuroses that result from existential distress and the failure to find a sense of purpose in life *noogenic neuroses*. He devised a therapeutic intervention for treating noogenic neuroses called logotherapy. Logotherapy seeks to aid the individual in discovering the *logos* (the reason or controlling principle) of existence. It assumes that people are able to adopt an attitude that controls day-to-day events and can have a powerful effect on the meaning of our daily work. Frankl found that some people in concentration camps could somehow find meaning in their suffering. By doing so, they

were more likely to be survivors. Even in situations where we have little control, we can make a choice about our attitude. If we can see suffering in a larger context, as serving some possible and meaningful goal, we are better prepared to deal with it and survive. Frankl commented that “in some way, suffering ceases to be suffering at the moment it finds a meaning” (as cited in Viney & King, 1998, p. 416). In logotherapy Frankl helped clients search for an alternate perspective on their situation. He rejected the idea that there is one universal meaning orientation, and that all individuals must explore the possible meanings in their particular situation.

Frankl believed that human beings have an innate capacity for what he called paradoxical intention – the ability to do the very opposite of what we would prefer to do. This ability lies dormant in all people and is the source of defiant or even heroic acts. He claimed it as one of the unique features of being human.

Carl Rogers (1902-1987) is another psychologist who challenged established views of psychology. Rogers opened the doors to studying the methods and effects of psychotherapy. Rogers recorded his psychotherapy sessions and assessed results with pre and post tests, comparing clients to control groups. Prior to the Rogers studies, psychotherapy was a mysterious process practiced behind closed doors by only an elite group of therapists. Rogers also opposed the medical model approach to psychology, where diagnosis precedes treatment. Rogers was concerned about the negative effects of labeling his clients. He rejected diagnosis, and proceeded directly to listening to his clients as a means of determining and initiating treatment.

Rogers emphasized a focus on the entire range of experiences that comprise a person’s life (known as the phenomenal field). According to Rogers, the *self* includes all

the ways we evaluate ourselves, others, and the way we relate to objects in the environment. The self is constantly evaluating and comparing itself to the *ideal self*. The greater the congruence between the two, the greater the health. Rogers believed that the valuing process is based on the difference between unconditional positive regard (indicating intrinsic worth) and the conditional love to which many children are subjected. The task of the therapist is to provide an accepting atmosphere marked by unconditional positive regard. In this environment, the client can move toward self-actualization. Over the years, Rogers became involved in education, advocating a student-centered rather than a teacher-centered pedagogy.

Humanistic psychologists such as Maslow, Allport, and Frankl, were criticized for the lack of rigor in their studies compared to what is typically expected within scientific experiments. Despite the criticism, humanistic psychology has established a significant position within the larger field of psychology. The humanistic viewpoint gained momentum during the 1960s while behaviorism and psychoanalysis still dominated the field. The humanistic viewpoint became known as the 'third force' in psychology because it stood in contrast to the two dominant systems of thought. Both behaviorism and psychoanalysis emphasized a deterministic perspective, while humanistic psychology emphasized the capacity for free choice. Humanistic psychologists advocated a broader field of study, arguing that psychologists should add the meaning of human experience to their areas of interest, claiming that psychologists should find ways to come to terms with all aspects of human life.

Humanistic psychology is now a well-established field of study. In the 1970s and 1980s a number of programs were developed to provide graduate degrees with a

humanistic orientation. By the close of the twentieth century, there were several prominent humanistic centers offering research programs that promise new directions for humanistic psychology in the twenty-first century (Viney & King, 1998).

ACT FOUR

Scene 6

BILL: Thanks, Minerva, that was helpful. I know some of this stuff is ok, but I get upset because I don't find much of psychology to be scientific or based on a sound philosophy. I know my views are considered narrow minded, but I myself feel pretty firmly grounded because I believe there is a bigger purpose in life than my own personal gain.

TONI: It's ok, Bill, this has given me some things to think about.

GEORGE: Some of this stuff sounds familiar. I remember the whole T-Group thing back in the 70s. Sounds like it shows up in business too.

MINERVA: Right, George. Management theory picked up on all the natural and social sciences and applied them to the work force. Almost like having a living laboratory...

Management Theory 1900-1950

Frederick W. Taylor's studies at Bethlehem Steel in the late 1890s marked the application of science to the management of large operations. His ideas of management, however, were not actively applied until the early twentieth century, during which time his theories caught the imagination of the American public. Taylorism effectively

expressed and legitimized a bureaucratic centralization of power. The new management schools embraced his theories, creating a professional agenda for managers in modern corporations as well as educators. Organizations were encouraged to make scientific studies to improve the management of bureaucracy. Scientific management theory followed Newtonian physics and treated the organization as a machine, with machine like qualities. Every component of the organization had a specific role. Each role could be scientifically selected to ensure maximum efficiency.

In a study conducted between 1912-1915, Thompson (1915) documented the application of scientific management in 140 organizations with workforces of more than 100 employees. Although the new theories were only in practice amongst less than one percent of the industrial workforce, Thompson claimed that the movement was expanding rapidly. He stated that “Scientific management shares with the modern movement of cost statistics the credit for the wide-spread interest in the improvement of methods and details in factories of every type...[and that] ‘production engineering’ just now is belatedly coming to town” (p. 306).

Taylor’s philosophy of management was brought to government attention during hearings in 1910 and 1911. In 1910 the railroads north of the Ohio and Potomac rivers and east of the Mississippi River filed a request with the Interstate Commerce Commission to raise rates. From September through November of that year, a series of hearings were held to make a determination on the request. Louis Brandeis (1856-1941), who later became a Supreme Court Justice, was a leading attorney objecting to the increase. Brandeis had read some of Taylor’s papers and, having discussed them with others, he came to the conclusion that wages could be increased and labor costs reduced

simultaneously if operations were more efficient. In his search for expert witnesses Brandeis held a meeting at the apartment of Henry Gantt (1861-1919), one of Taylor's close associates. Among others, Gantt, Brandeis, and Frank Gilbreth were in attendance. In hearings conducted between 1910 and 1914 Brandeis effectively argued against the rate increases.

Then, in 1911 the unionized machinists and molders at the Watertown Arsenal walked out in protest over the application of Taylor's system. The workers returned to work but petitioned an investigation by the Labor Committee of Congress, requesting protective legislation. An investigation was conducted; the subsequent brief report recommended no legislation. There was, however, a large mass of testimony published. Many of Taylor's supporters and collaborators, such as H.L. Gantt, Carl G. Barth, and Henry Metcalf, published books and articles on the topic. Taylor did not publish his own paper on the topic until 1911, the same year his book *The Principles of Scientific Management* was published (Thompson, 1914).

The fundamental principles of scientific management as described by Taylor were

First. Each man in the establishment, high or low, should daily have a clearly defined task laid out before him. This task should not in the least degree be vague or indefinite, but should be circumscribed carefully and completely, and should not be easy to accomplish.

Second. Each man's task should call for a full day's work, and, at the same time, the workman should be given such conditions and such appliances as will enable him to accomplish his task with certainty.

Third. He should be sure of large pay when he accomplishes his task.

Fourth. When he fails he should be sure that sooner or later he will be the loser by it.

When an establishment has reached an advanced state of organization, in many cases a *fifth* element should be added, namely, the task should be made so difficult that it can only be accomplished by a first-class man (Taylor, as cited in Cunningham, 1911, p. 541).

R.F. Hoxie, in a 1916 article in the *Quarterly Journal of Economics*, claimed that scientific management was “one phase of the efficiency philosophy and movement which of late [has] gripped the imagination of the business world and which may be said to constitute the latest phase of capitalistic industrial development” (p. 62). Taylorism became the political philosophy of bureaucratic organizations, including the federal government, gaining popularity through the early years of the century. His ‘system’ was applied to a wide variety of industries, ranging from the railroad, to shop operations, clerical operations, and the retail industry. In a study published in 1916, C. Bertrand Thompson claimed that

Scientific management in its best manifestations may be distinguished from other types of management in that it proceeds on industrial principles which may be defined as generalized rules of conduct based on *law*, recognized or as yet undiscovered, and useful for the attainment of important industrial ends such as maximum output, low cost, high wages, equitable distribution, reduction of unemployment, industrial peace. If we define a law as a summary statement of fact or a description of a tendency common to a class of things, then an industrial law is any law, physical, chemical, biological, psychological, economic, or social, which is or may be a factor in industrial management. The test by which scientific management makes any law an industrial law is the effect of that law on economy of production or conservation of energy, human or material.

What makes a type of management scientific, then, is the fact that it rests on laws and principles rather than on policies. To be sure, until all the laws and principles of management are ascertained, it still remains true that policy must play a large part and that to that extent management remains at least partially an art; but the intention and the conscious effort to reduce the field of policy and enlarge that of principle and law justly entitle any system which holds to it consistently to the name scientific management.

That the Taylor system is such a system has been shown in former articles. It rests on both laws and principles. Its laws are the physical and chemical laws covering materials, equipment, and processes; and the psychophysical laws, undoubtedly operative no matter how dimly understood, which govern the individual conduct and reactions of the human beings involved. Its principles are those which govern the relations of individuals to each other in organized groups and the methods of procedure by which scientific management is made effective in practice. It

is important to bear in mind the distinction between the science on the one hand and the principles on the other. Natural laws are fixed and inflexible. They cannot be altered by a majority of votes. Principles, however, if defined as rules of conduct, may be changed and in fact are constantly subject to modification... This analysis makes clear the fact that scientific management is the extension to industrial organization of the positivist movements in current thought... scientific management is positive management... So far as possible, nothing is left to accident or to individual judgment (Thompson, 1916, pp. 312-315).

Frank (1868-1924) and Lillian Gilbreth (1878-1972) were associates of Frederick Taylor. Unlike Taylor, the Gilbreths' had experience in unionized industry. Frank Gilbreth was an engineer and Lillian was a psychologist and the author of *The Psychology of Work* (1911). The Gilbreths' expanded on Taylor's theory of scientific management. Their method emphasized focusing on identifying the elemental motions in work. Taylor identified the elemental motions in work, assessed the way these motions were combined to form operations, and the time required for each motion.

The Gilbreths' believed it was possible to design work methods whose times could be estimated in advance rather than studying an existing process and making minor change. One of Frank Gilbreth's first studies concerned bricklaying (he had worked as an apprentice bricklayer). Based on his observations, Frank designed and patented special scaffolding that permitted a bricklayer to work with a minimum of bending and reaching; his invention more than doubled the productivity of a bricklayer. The Gilbreths believed there was 'one best way' to do a job (a principle of Taylor's), but that way could be discarded when a better one was devised. Frank Gilbreth wrote *Motion Study* in 1911, and together they wrote *Applied Motion Study* (1917); between the two of them they published more than 20 books and articles on scientific management, motions studies, and the psychology of work.

Another compatriot of Taylor's was Morris L. Cooke. Cooke was one of only four men, including Gantt, that Taylor acknowledged as true followers and who he authorized to teach his system. Cooke was trained as an engineer. Before meeting Taylor, Cooke questioned the inefficiencies in industry and attempted to apply scientific methods to eliminate waste. Taylor was so impressed by the young engineer when they met that he recommended Cooke to be commissioned to study at the American Society of Mechanical Engineers.

Taylor also recommended Cooke to the Carnegie Foundation for the Advancement of Teaching to study the efficiency of higher education administration. Cooke published his report titled *Academic and Industrial Efficiency* in 1910, launching him into instant notoriety. In the report, Cooke claimed that the university committee's decision-making structure was cumbersome, the system of tenure protected unproductive professors, and that departments were uncooperative. He recommended the establishment of 'student credit hours' as the unit of measure for rewarding professors based on efficiency. He also recommended the development of a university system that looked more critically at itself rather than seeing itself beyond the criticisms of the society that supported it.

Following his work at the university, Taylor recommended Cooke to the new mayor of Philadelphia. In 1911 Cooke accepted the job of director of public works, eager to try out his ideas on efficiency in the public sector. His book, *Our Cities Awake* (1918), presented his case for improvements in municipal management. Over the course of four years, he saved over \$1 million in garbage collection and sued the Philadelphia Electric Company over its rates. When World War I erupted, Cooke advocated an efficiency

organization to Secretary of War Newton Baker in order to manage the war scientifically. Baker liked Cooke's suggestion and Cooke became a prominent figure in Washington D.C. Cooke's contributions to the field of scientific management are significant. He expanded the system of scientific management beyond the manufacturing industries, applying the concepts to higher education and government. His work was recognized by President Hoover, who appointed him, along with another noted efficiency engineer, Harrington Emerson, to a committee to eliminate waste in industry (Duncan, 1989).

French industrialist Henry Fayol (1841-1925) contributed to the scientific school of management theory with his establishment of a set of fourteen universal principles of management. He claimed these principles could be taught in universities and schools. Fayol spent his entire working life of forty-eight years with the mining and smelting company, Commentry-Fourchambault, in France. He started his career in 1860 as a mining engineer, became a pit manager in 1866, and then the managing director in 1888. Two years before his retirement in 1918, Fayol published a 162-page paper titled *Administration Industrielle et Generale* (1916). Following his retirement, Fayol continued to write and speak on business management and public administration until his death in November 1925. Fayol was a well-noted authority on administration and his fame spread throughout Europe and into North America, although he was not well known in England and America until a limited version of his writing was translated into English in 1930. He is considered the founder of administrative management, and from 1900 on, his contributions focused on administrative rather than technical issues.

Fayol's use of the term 'administration' was frequently translated into English as 'management'. However, this does not exactly fit with his use of the term. Fayol saw

administration as only one of the six functions of management, which also included technical operations, commercial operations, financial operations, security, and accounting. Fayol was one of the earliest of the management writers who viewed management or administration as a process and not simply a set of rules and structures, even though these were necessary. Fayol saw management or administration in terms of five functions: plan, organize, command, coordinate, and control. He viewed these activities as duties and not necessarily independent tasks. His five elements of management and the associated sixteen organizational duties were to be performed in accordance with his fourteen principles of administration. His fourteen principles, although prescriptive, were also open to flexibility and interpretation. The principles are:

Specialization/division of labor: Labor is allocated and specialized in order to improve efficiencies, although there are limits beyond which it would bring diminishing returns

Authority with corresponding responsibility: If responsibilities are to be allocated, then the responsible person needs the requisite authority to handle them.

Discipline: Fayol argued that discipline only applied to honoring agreements and rules.

Unity of Command: Fayol believed that employees should not be subject to orders from two different and potentially contradictory sources.

Unity of Direction: Fayol viewed the organization as a living organism and any living organism cannot survive with two heads. There has to be clear agreed upon purposes and plans.

Subordination of individual interest to the general interest: The interests of the whole are greater than those of the individual. This principle requires unitarianism – a shared set of values by all people in the organization.

Remuneration: Pay should be fair and enough to motivate without being excessive.

Centralization: Fayol favored a pragmatic approach where appropriate levels exist for each type of decision, with executive management at the head.

Order: Organization and order are held as an ideal.

Equity: Equity, fairness, and a sense of justice should be pervasive in the organization.

Stability of Tenure: Time is an important investment and a necessary ingredient for an employee to adapt to his/her work and perform it effectively. Fayol emphasized investing in managers who know the organization.

Initiative: Organizational zeal, enthusiasm, and energy are enabled by people who have personal initiative and should be engendered and encouraged in the organization.

Esprit de Corps: Fayol emphasized the need for building and maintaining harmony among the work force, including teamwork and good interpersonal relationships. He argued against a culture of memo writing,

which he considered divisive, and advocated personal, verbal communication.

Fayol also introduced the use of the organizational chart, job specifications, and the concept of management as a field of education and training, as well as some original ideas on industrial psychology. His stress on long-range planning was unique in his time. His emphasis on clear hierarchical divisions was balanced by his belief that administrative activity is spread throughout an organization (Elwell, 1996; Nixon, 2003; Wood & Wood, 2002).

The sociologist Max Weber contributed to the scientific management movement with his proposed 'ideal type' of organizational structure. Weber believed that the rationalized bureaucratic structure of large organizations was a distinctive mark of modern social structures. The rational organizational structure was bureaucracy characterized by a division of labor (specialization of activities), detailed rules and regulations, and impersonal relations. Weber was concerned that the growth of the state and the increasing complexity of society threatened personal liberty. He believed the task of sociology was to provide a conceptual framework that would make human society, and therefore the world, understandable. His famous 'ideal types' were constructed as analytical tools that could be used to assess the impact of human systems on society. Although designed as a tool for social analysis, Weber's design prototype became the model for both private and public organizations (Elwell, 1996; Nixon, 2003).

Industrial engineer Henry Ford adopted the principles of scientific management as well as Weber's bureaucratic form and Fayol's administrative management. Ford recognized the growth trend in the production of automobiles. In 1893 Ford built a

gasoline engine and in 1899 went to work for the Detroit Automobile Company. In the plant cars were still built one at a time. Ford wanted to incorporate ideas from other industries, including assembly lines and standardized parts. His employer resisted the idea. Ford left the Detroit Automobile Company and began to produce racing cars. After several failed attempts, Ford finally obtained backing and incorporated the Ford Motor Company in 1903. In the early years, the company produced only a few cars a day. Ford visited a meatpacking plant in Chicago where he observed, and was impressed with, the speed and efficiency of the plant. He reasoned that if cattle could be disassembled efficiently, then cars could be assembled using the same approach. As a result, Ford developed the moving assembly-line method of car production in 1914, producing cars more quickly and cheaply. The savings were astounding. During the first operational year of the moving assembly line, production almost doubled, but the number of employees dropped by about 1500. In 1908 Ford introduced the Model T at the price of \$850; by the 1920s he had reduced the price to \$275, despite the inflation caused by World War I.

Ford effectively applied the principles of scientific management. However, there was a price to be paid for the efficiency of the assembly line. Workers who did the same task day after day became bored and fatigued. Ford experienced high turnover of workers. He sought to reverse the trend by paying his workers five dollars a day – an amazing wage for an industrial worker. Although his competitor's thought he was foolish, his move paid off. The wage hike reduced turnover and improved productivity. And, as an unexpected return, many of his workmen could now afford to buy a car, increasing his sales.

By the 1920s, Ford was producing over half of the cars in America. Between 1922 and 1930 the United States produced over thirty million passenger cars. The boom in automotive sales stimulated many other businesses: the industries that provided materials, such as steel, rubber, and glass flourished. The machinist industry blossomed. Construction companies benefited as highways and garages were built. Oil companies, who were losing revenues in kerosene sales as electricity spread, replaced the lost revenues with increased sales in gasoline (Duncan, 1989; Gordon, 2001).

Taylor and his associates were concerned about efficiency, but it is Harrington Emerson (1853-1931) who can be credited with creating a philosophy of efficiency. Emerson believed that while work should be conducted in an efficient manner, it should also be a blessing rather than a curse. Emerson developed, independently, his own version of efficiency management. Emerson was one of the first management professionals to create a professional consulting company with other than an engineering focus (established in 1899). Emerson focused on the reduction of waste as a means to lower the cost of production and consequently provide for an increase in wages.

Born in Trenton, New Jersey, Emerson's father was a professor of English literature and a Presbyterian minister. As a young man, Emerson studied in Germany, England, France, Italy, and Greece. He was able to speak nineteen languages and at the age of twenty-three was appointed as the head of the modern foreign languages department at the University of Nebraska. After five years, he lost interest in university life and turned his interest to the business world. He then spent twenty years conducting research on economics and engineering for the Burlington Railroad. He also served as a consultant to firms around the world. As a consulting engineer, he reorganized the

Atchison, Topeka, and Santa Fe Railroad where he also introduced a number of cost accounting, record keeping, and bonus systems. Because of his expertise, Emerson became a key witness in the Eastern railroad rate cases fought by Louis Brandeis. He testified that the railroads could save “a million dollars a day” (Cunningham, 1911, p. 545). As a result of his involvement in the trials, his fame grew and both industry and government engaged his services. Taylor never completely trusted Emerson’s approach to efficiency engineering and so Emerson’s contributions were independent of other supporters of scientific management. Unlike Taylor, Emerson took an interest in the individual worker, believing that the concepts of scientific management needed to be justified to the worker.

In 1908 Emerson wrote *Efficiency as a Basis for Operations and Wages*, in which he contrasted the inefficiencies of human actions with the efficient methods of nature. He used the example of ‘nature’s pump’ whereby water is drawn from the oceans into the upper atmosphere, carried thousands of miles to the mountains and plains, and deposited; all without pipes, friction loss, or mechanical parts. His claim was that if humans could be as efficient there would be no poverty. To reach a higher level of efficiency requires careful analysis of the elements of work and then transferring this knowledge to the workers. Secondly, he believed that goal setting is required. He claimed that humans could operate at sixty per cent efficiency, but, he believed that the lack of goals resulted in efficiencies that fell below one per cent. Like other writers of his day he emphasized the importance of both goal setting and task management.

Emerson’s extensive travels allowed him to study and accumulate knowledge about the ways in which work was performed in many countries. He found that all

countries suffered the burden of inefficiency, but also noted the unique strengths of each. He credited Great Britain's position as the industrial leader of the world to their discovery of the importance of oceanic trade. While most countries were building fast wooden ships, Britain was developing steamers. He credited the Germans with their intellectual abilities, which served as their source of economic development. He saw the French as logical innovators – they developed the fastest trains, the first submarine, the machine gun, and photography. And America excelled through the accomplishment of great individuals, like Edison, Ford, and Westinghouse. As a result of his exposure to difference cultures, Emerson was capable of thinking in broader terms and with less cultural bias about management and productivity. One of the unique differences between the writings of Emerson and the larger body of scientific management consultants were his insights into the relationship between efficiency and organizational design. He advocated a decentralized organizational model, claiming that the bureaucracy of large factories led to inefficiency. In addition he taught that the way work is structured and who performed it also affects cost and productivity. He led energetic discussions about the virtues of the line and staff form of organization. He used an analogy that nature, the human body, and other well-functioning systems are all organized around line and staff concepts. Like Max Weber, Emerson was impressed by the organization of the Prussian army, which was organized around line and staff with functional specialization led by a strong executive who controlled, adjusted, and harmonized the line and staff to accomplish the organizational objectives.

In Emerson's model, the line has the authority to initiate action in conjunction with staff officers. Staff is responsible for the selection and training of employees (human

resources), overseeing the proper installation and maintenance of equipment, for ordering the right material for use by employees at the right time, and for working with line employees to determine the best methods for accomplishing work. The means by which efficiencies are maintained are through the development and adherence to professional standards; a set of predetermined rules that govern the line operations. Emerson concluded his book *Efficiency as a Basis for Operations and Wages* with the statement that “efficiency is unattainable from overworked, underpaid, and brutalized men [efficiency is achieved when] the right thing is done in the right manner by the right employees at the right place in the right time” (as cited in Duncan, 1989. P. 35).

Emerson’s most influential book was *The Twelve Principles of Efficiency* (1913) in which he argued for simple, common sense principles as the guide to organizational efficiency. The introductory statement to his book states that

The twelve principles are not isolated and independent influences, but are interdependent and co-ordinated – related to one another...as the stones of a dome. One or even several may be lacking; yet the structure, though weakened and imperfect, will stand. From a wholly material, non-moral, and near-visioned point of view, indeed, the seven ‘practical’ principles alone would be sufficient for the achievement of success. Even an evil purpose can be effectively accomplished by their observance. When, however, these are interlocked with the five ‘altruistic’ principles, purposes, as well as measures, are turned from lower temporary desires to the larger eternal desirabilities. The doctrines of efficiency therefore define something infinitely greater than a system of management. They set forth a morality, and provide practicable measures for its attainment (Emerson, 1917, p. ii).

The first five principles are labeled as ‘altruistic’ and the last seven as ‘practical’. He used examples from nature to illustrate each principle. His twelve principles are:

Ideals: The ideals of the manager must be promoted and embedded within the organization. A clear sense of managerial ideals leads to a high degree of individual and aggregate excellence.

Common Sense and Judgement: The lack of common sense leads to over-capitalization. Unnecessary machines are purchased, installed, and employed less than full time.

Competent Counsel: The increasing complexity of business requires the use of technical experts. No single manager can be competent in all areas. The use of competent counsel is necessary to ensure that 'best practices' are used in all areas.

Discipline: Discipline is a necessary component of cooperation. Using another example from nature Emerson contended that the fundamentals of discipline are better learned from the "government of a beehive than from college courses, from armies, or from an industrial organization...cooperation is a matter of course, not a virtue; its absence is the crime" (Emerson, 1917, p. 150). He believed in preventive control – the hiring decision being the critical point for initiating discipline. One of the worse faults a manager could commit was to hire people for jobs for which they were unfit. Under the best forms of management there are few rules and fewer punishments. There are, instead, standard practice instructions that everyone understands and in which everyone knows his or her role in the organizations success. "Supernal discipline is inspired by a greater emotion than fear" (p. 150).

Fair Deal: According to Emerson managers need three important qualities: sympathy, imagination, and a sense of justice. This includes the establishment of parity between pay and performance.

Reliable, Immediate Adequate and Permanent Records: Once again Emerson used the example of nature, “Many of Nature’s warnings are reliable, immediate, and permanent; they reach us and the other animals through the senses – we hear, we see, we smell, we taste, above all principally we feel” (p.205). In large organizations, however, the senses are not adequate to collect all data. Records, therefore, “increase the scope and number of warnings, to give us more information than is usually received immediately through our senses” (p. 206). Records give us warnings, allowing us to recall the past and make projections into the future. He emphasized the importance of cost accounting as a means to know how well things are operating.

Planning and Despatching: Emerson adopted the term *despatching* from the railroad industry. By planning and despatching he was referring to the tally at the end of the day, week, or month, by which there is a perfect balance between work planned and work executed.

Standards and Schedules: Emerson pointed out that standards and schedules can be mathematically precise, or defy quantification. The point is that humans have wrongly reasoned that more results require more effort. He reasoned that animals in nature achieve astounding results with a minimum expenditure of energy. Rightly measured, “there is only one

point where maximum result is attained for minimum effort, a point properly scheduled at 100 percent” (p. 264).

Standardized Conditions: “The easiest way for any individual to live his own life in fullest measure is either to standardize himself to suit the environment or to standardize the environment to suit himself” (p. 283).

His claim is that man, “The youngest of nature’s brood, has attempted to satisfy great wants without standardizing either himself or the environment” (p. 284). He proposed that organizations standardize either themselves or their environment for greater efficiency. The acceptance of past techniques and rules of thumb propagate inefficiency and the increased expenditure of effort crowds out intelligent control. The future cannot be created out of the past; it must be reinvented afresh.

Standardized Operations: Good results are never achieved by chance. The standardization of operations supports good outcomes. According to Emerson high levels of efficiency require only proper intelligence, spirit, and organization.

Written Standard-Practice Instructions: Written instructions are permanent laws and practices of the plant. Written instructions enable organizational learning and the opportunity for continuous improvement.

Efficiency Reward: Emerson promoted reward that consisted of three components: “pleasure in the work...a definite end in view, a definite accomplishment...[and] form” (pp. 394-395). By form, Emerson meant the grace and ease inherent in a good work process. A skilled ice-skater,

for example, had form in comparison to a novice. Reward was in the work itself; mere monetary reward did not equate to maximum efficiency.

Maximum efficiency, however, could result in monetary reward and also result in maximum satisfaction with one's work.

Emerson promoted a type of scientific management based on a philosophical perspective that transcended Newtonian physics. Man, imbued with a spirit, is more than the sum of his parts; the human spirit is the source of creative energy. He proposed that

The man of supreme ability is the one who can create and control an organization founded on and using principles to attain and maintain ideals, who then is able to assemble for the use of his organization in incidentals of land, of men, and money (labor and capital), of buildings and equipment, of methods and devices (p. 422).

Emerson ended his book with the statement that "It is impossible that righteousness married to wisdom should rule without immensely benefiting humanity" (p. 423).

While the principles of scientific management were being applied to American business, the country entered a period of progressive reform. The Human Relations movement started as an outgrowth of the unprecedented cooperation between government, unions, and business during the First World War. Mobilization of the economy to support the war led to full employment. The government sought ways to engage the American people in the war effort. The war raised a need to increase productivity. The government encouraged corporate managers and owners to bargain with elected employee representatives. Officials sought increased productivity through the reduction of industrial disputes, absenteeism, and turnover, as well as through the standardization of working conditions and pay structures. These were exactly the types of issues Taylor sought to address through his Scientific Management system. However, in

order to facilitate these objectives, the government encouraged worker representation rather than the segregated decision-making systems advocated by Taylor (Reshef, 2003).

Henry Gantt, perhaps the most influential of Taylor's associates, integrated the human element with Taylor's approach to scientific management. Gantt's experience with labor differed from Taylor's. The Civil War had taken Gantt's family from prosperity to privation. As a result, Gantt came to understand an aspect of work that Taylor never seemed to recognize or appreciate – the perspective of the worker. Gantt's work concentrated more on processes that included the workers' perspective, such as motivation, leadership, and training. Gantt supported democracy on the job, socialism, and reward of workers. He also held strong views about the social responsibility of business and management. In his last book, *Organizing for Work* (1919), he expressed concern for the future of America's free enterprise system if organizations did not find some means of reconciling the quest for profits with the welfare of society. Gantt believed that business firms exist only for the good of society. If society deemed a business enterprise's existence too costly in comparison to the benefits received, it would take such action as necessary to destroy it.

Gantt held a fear of big business. In his estimation, as businesses became larger and controlled the market, they became less responsive to the needs of customers and pursued excess profits through higher prices. Gantt heralded the emergence of concern for social well-being in the midst of scientific management, signaling the beginning of the reform movement (Duncan, 1989).

The reform movement brought with it a new set of management theorists. Disciples of the new social sciences and the field of experimental psychology began to

promote the new science in industrial settings. Referred to as a behaviorism, the new science emphasized the importance of understanding human behavior as a means to work with and motivate employees. One of the early behaviorists was Mary Parker Follett (1868-1933).

Like Frederick Taylor, Follett believed in analyzing the situation in order to improve organizing and managing; but unlike Taylor, she believed workers should be involved in the analysis rather than just managers or experts. As a business consultant, Follett played the role of social philosopher and business institutionalist. Follett began her career as a political scientist and distinguished herself on her work on various political ideologies. Late in her career, she turned her attention to industrial lectures and business literature. She emphasized 'human factors' in management. The mode of thinking in her day was still based on a limited, scientific, technique-oriented methods of management. Follett offered strong support for the individual behavior-pattern, group thinking, and continuous decision making. Like John Dewey, she suggested the facilitation of democracy and individualism through the structure and operation of groups. Follett moved beyond Taylorism, declaring it correct in outline but incomplete. She proposed that management take an expanded role in the development of an ideal democracy at the group level.

The shift away from the belief in a set of scientific laws governing society and economics was expressed even among economists. In a 1929 article in *The Quarterly Journal of Economics*, O.H. Taylor claimed that

the idea of natural laws, which so largely dominated scientific and philosophical thought in the eighteenth and nineteenth centuries, has in recent decades lost something of its former freight of meaning, and perhaps of its former prestige. Philosophers have been criticizing the

notion which the phrase conveyed to the nineteenth-century mind, and especially the uses that were made of it in psychological and social 'sciences'; and even physical scientists have been revising their conceptions of the nature and significance of scientific 'laws.'...The tendency of present-day economists, even of the more 'orthodox' type, to speak with more modesty and caution about the 'laws' of their own science, and to drop all rhetorical language about the 'natural laws' of economic life is thus in harmony with current tendencies in other sciences...

In the last few decades, physics itself appears to have been moving away from the rigid doctrine of determinism...The view is expressed by high authorities that all scientific laws may be only 'statistical laws'; that is, laws of the average behavior of things or entities in 'crowds', which leave the behavior of individual entities partly a matter of real 'chance,' and which may even leave room, in the case of the higher organisms, for 'free will.' The whole matter is under lively discussion among physicists. Determinism, if not universally abandoned, at least is under fire. Meanwhile, teleological ideas crop up with renewed strength in some quarters...

Now it is clearly the mid-nineteenth-century conception of purposeless but inexorable 'laws of nature,' which has caused most of the trouble in the social sciences...the bias introduced by this whole way of thinking has caused the knowledge of men's motives and purposes which we acquire in practical life to be neglected, because the notions of practical life do not square with the dogma of mechanistic determinism. It may be that the change now in progress in the philosophy of the natural sciences will in time produce a 'mental climate' more favorable to the unembarrassed progress of the social sciences (pp.1-11).

Follett's notion of the modern organization as an embodiment of the state and civil society was prevalent in managerial thought into the 1930s. During this time, the writings of men such as Elton Mayo (1880-1948), Chester Barnard (1886-1961) and Douglas McGregor (1887-1957) began to appear. These management theorists argued, through their research findings, that business owners could achieve their organizational goals in a more humane way. They presented the idea that business owners should create and design their organizations and work environments to recognize and meet the work needs of their employees and not treat them inhumanely or impersonally like a cog in the machinery (Miller & O'Leary, 1989; Sethi, 1962).

Mayo's philosophy was based in the perspective that the "human mind and the social organism are still very largely uncivilized" (Mayo, 1923, p. 117). He felt that the calm, scientific approach we take to solve the problems of inorganic materials is abandoned in a heat of temper when dealing with human issues. He claimed that human beings all too often resort to primitive force in dealing with one another.

Mayo noted that exceptions do exist, as in the case of WWI, when scientific methods were employed to address the problem of 'shell-shock'. Mayo noted that military leaders quickly "discovered that 'shell-shock' was a mental condition that required medical treatment rather than punishment. It was not due to cowardice but was the inevitable effect of abnormal living conditions, overstrain and fatigue" (p. 117). He was dismayed that we could come to an understanding of the damage the war caused on men's mental state and fail to see the need to apply this lesson in industry.

Defective or mistaken factory organization may be just as effective as war in giving rise to overstrain, fatigue or manifestations of abnormality. There is, of course, less sense of imminent personal danger in industry; but economic fears of another type may be as urgent and overstrain and fatigue conceivably greater. This last claim must be conceded when it is realized that in industry, so far as the individual is concerned, we may be dealing with a twenty-year accumulation of fatigue and disgust and not merely with a two or three-year period (p. 117).

Mayo's point was not that labor turnover or other symptoms of industrial discontent were due to stress and fatigue, but rather that "when men are 'difficult' or 'unreasonable' there is always a cause. This cause is usually complex, it is always unknown both to employers and employed; but it is discoverable" (p. 118).

Mayo advocated a combination of worker involvement with scientific means of discovery in order to identify and remedy the cause of industrial human relations issues. Mayo claimed that "psychology has recently shown a capacity for stepping out into the

turbulent market place, for illuminating with understanding the human aspect of the transactions of the market...The problems of business are not merely scientific, they are human” (p. 120).

Mayo participated in and published research findings on human relations experiments conducted at the Western Electric Company Hawthorne plant. In a paper published in 1930, Mayo indicated that the physical and mental well-being of the six women in the five-year study improved as the women came to trust one another and their supervisor. The company officer appointed the task of supervisor conducted himself in such a manner that the women came to view him as a

sympathetic listener and not as a gang-boss with fixed ideas about production. They talked freely every day, they lost their original shyness, and they confided to him most enlightening stories of the effect on them and others of ‘bully-ragging’ methods of supervision. That their liking for their work increased is shown not merely by these confidences but also by their record of absences which is only a fraction of the department average or of their own former habit. So the provision of an impartial person to observe change became itself the greatest change, and has led to a complete revision of the company’s conception of supervision, and of its method of training supervisors. Whereas supervisors have generally tended to be talkers and ‘drivers,’ those who get the best results from their workers are found to be good ‘listeners,’ whose conception of improvement rests upon betterment of working conditions rather than the application of spurs or incentives to the workers. Increases of production – quantity and quality – occur in response to social and physical improvement of conditions and not as the result of conscious effort; in the majority of instances the worker, himself or herself, is as much surprised by the improvement as the observer (Mayo, 1930, p. 171).

During the study the researchers also observed and noted the impact that factors outside the workplace had on worker productivity. One of workers experienced a period of stress over a situation at home. Her productivity failed to meet that of her co-workers.

As she became accustomed to the new conditions of work she began to talk to the observer and to her fellow workers of her situation, and her preoccupations, once expressed, became less morbid and more practical...

[Over vacation she solves her dilemma] and at once her production rises and steadies. Production...shows very remarkably the 'combined effect' of all the factors in the situation.

On the basis of these observations, the Company has formulated a new plan – that of 'interviewing' all forty thousand employees...The interviews are kept carefully anonymous; neither fellow-workers nor high officials can trace any comment to its source. The questionnaire method has been found to be useless; the more fruitful approach to the individual is conversational and indirect. The person interviewed can talk of any topic he chooses for as long as he likes to a trained 'listener' provided by the Company; he is paid his average earnings for the time thus spent. Already over thirteen thousand workers have been thus interviewed; the effect has been an unquestioned improvement of morale in the plant and a complete revision of the Company's method of instructing supervisors.

The experiments...have been made with workers engaged upon highly mechanized and repetitive operations. The tentative conclusions drawn by the Company are something as follows:

1. Total daily output is increased by rest-periods and not decreased. The rest period method has been extended to several departments, with results analogous to those of the test-room.
2. The conditions of work during the working day have more effect on production than the number of working days in the week.
3. 'Outside' influences, i.e., conditions not directly relevant to the task, tend to create either a buoyant or depressed spirit which is reflected in production. A distinct relationship is apparent between the emotional status of the girls and the consistency of their output.
4. The method of the supervisor is the single most important 'outside' influence. Home conditions may affect the worker and his work; a supervisor who can 'listen; and not 'talk' can in many instances almost completely compensate such depressing influences.
5. Pay incentives do not stimulate production if other working conditions are wrong. A second experimental group was given a pay incentive only as its production improved somewhat, but not to an extent comparable with the original group. A third group was set to work under the improved conditions, but without increase pay incentive; its improvement was, and is, entirely comparable with the original group.

The general conclusion with respect to the mechanization of industry that seems to be indicated by these inquiries is that the mechanization itself is of no great importance in an industry that sets itself, intelligently and diligently, to discover what human changes of method must accompany the introduction of repetitive methods of work (pp. 171-175).

Mayo concluded that the fervor over mechanization leading to a 'dumbed down' society were the result of misguided theories. Industrial problems were not the result of

mechanization and that “We cannot make individuals stupid; we may make them dissatisfied, psychoneurotic, or restless” (p. 175). He once again restated his premise that “industry should give as much attention to humans as it has to material inquiry. [And that] With the institution of adequate researches, physiological, psychological, and social, society has nothing to fear from industrial mechanization” (p. 175).

The inability of industrial and political leaders to deal with the Depression became the basis for refuting the knowledge of both industrial and political administration. Mayo and others claimed that the Depression was only an economic issue on the surface; the underlying issue was social, brought about by social imbalances and the collapse of traditional forms of discipline. Therefore, governmental interventions to remedy the problem should be directed at social complications. Mayo claimed that corporations should assume the responsibility of addressing the emotional reactions of people that led to the Depression. He also recommended enmeshing people into effective, stable forms of collaboration. He advocated that only after an individual or a corporation takes charge of human emotions can organizations seek to produce rationality (Miller & O’Leary, 1989).

The work of people like Taylor, Follette, and Mayo in the period before 1930 produced a high level of academic interest dealing largely with plant supervision. As a result of the depression, there was a shift in focus. It was not until the thirties that books began to appear on the structural relations of large organizations. Of the various authors, Charles Barnard (1886-1961) had the most lasting influence. To the administration theories of Henry Fayol, Chester Barnard added a more developed understanding of social psychology. Barnard was the retired CEO of New Jersey Bell Telephone when he

published *The Functions of the Executive* (1938). In the book, Barnard outlined the role and legitimacy of the supervisor's directives and the attendant acceptance by subordinates. Both Fayol and Barnard were business executives; Barnard agreed with French management theorists, that an executive could have proper interchange of information with only a relatively small number of subordinates.

Barnard developed the concepts of strategic planning and the acceptance theory of authority. He described strategic planning as the formulation of major plans or strategies that guide the organization in the pursuit of major objectives. He taught that executives have three top functions: (1) to establish and maintain effective communication; (2) to hire and retain effective personnel; and (3) to motivate those personnel. His acceptance theory of authority states simply that managers have only as much authority as employees allow them to have; that authority flows downward but depends on the acceptance by the subordinate. Barnard taught that acceptance of authority depends on four conditions: (1) Employees must understand what it is the manager wants them to do; (2) employees must be capable of complying with the directive; (3) employees must understand and see the directive as keeping with organizational objectives; and (4) employees must see the directive as not contrary to their personal goals. Barnard believed that every individual has a 'zone of indifference' or a range within which he or she would willingly accept orders without consciously challenging authority. It was therefore up to the organization to broaden the zone of indifference so that manager's orders will be obeyed. In order to accomplish this, Barnard advocated that managers understand and practice effective human relations.

Barnard emphasized an understanding in human relations in order to effectively run an organization. He suggested that “with respect to understanding in the field of human relations...there should be instruction about formal organizations as organic and evolving systems” (Barnard, 1945, p. 178). He emphasized a biologic comparison because

we persistently think about such systems in terms of mechanical, rather than biological, analogy...It results in regarding an organization as static and fixed, like a machine, instead of something that is living, that has to grow up, and that is ever progressing or regressing with changing states of equilibrium of human forces involved (p. 179).

Barnard taught that the change of human beings was unlike changes in machinery. If a machine is replaced with one that does the same task there is no disruption to the system. If, however, a human being is replaced, the system is disrupted because the human comes with different values, language skills, and beliefs. It is only through experience that individuals unite to form a cohesive, operational group. Using communication and the use of language Barnard illustrates that

In ordinary human relations the same words in the same context often have different meanings when uttered by different individuals. We understand people easily through our experience with them, which teaches us their special uses of words, the meaning of intonation and gestures, whether they are matter of fact or emotional, given to exaggeration of understatement, are reliable or unreliable, are reticent or voluble, and many other subtle characteristics of communication. Without the confidence that accompanies this kind of understanding, reticence, hesitation, indecision, delay, error, and panic ensue. ‘Know your people’ is nearly as important as ‘know your language’ in the communication upon which organized effort depends (p. 179).

Relationships, therefore, are vital to effective communication of goals and objectives and in the accomplishment of tasks. These relations are also key to expanding the ‘zone of indifference’ (Allen, 1998).

ACT FOUR

Scene 7

ELLEN: That was fascinating, Minerva. I guess I have never read anything on management history. I have never even heard of any of those people except Gantt and I thought he just created a chart or something.

MINERVA: Now you will have some measure of understanding and sense of history to evaluate the advice you get from all those MBA consultants.

GEORGE: Sounds like Mayo applied science differently than Taylor – more qualitative than quantitative.

ELLEN: I have heard of the Hawthorne experiment, but I always thought it proved that it didn't matter what changes you made to the environment, it was the observation, or supervision that changed worker productivity.

MINERVA: There are some articles that interpret the results that way. That is why it is important to investigate for yourself and check the source rather than accepting everything you read or are told at face value.

GEORGE: The fascinating thing is that everything seems so practical and relevant to today, but the approach is seventy-five years old.

IRENE: Remember what Minerva said – things move so fast today that twenty years ago feels like ancient history to us. We should probably try to fully understand one concept before disregarding it and moving to the next. We seem to think new is better.

ELLEN: I think some of those new MBAs are just packaging old stuff and selling it as

new. When my boss gets stressed out, he's willing to pay anybody who claims to have an answer to his problems.

MINERVA: Unfortunately that seems to be part of mankind's repeating pattern. We follow anybody who claims to have an answer to our problems. Consider the situation that led to the problems in Germany and World War II...

World War II

The Great Depression of the 1930s was not confined to the US; nations throughout the world experienced economic decline. Hard economic times created political instabilities. Adolph Hitler was able to play upon nationalist hatreds, old resentments over WWI, and economic hardship to leverage his political aspirations. Hitler came to power through participation in the German democratic process. After years of economic woes, the Crash of 1929 triggered a series of events that worked to Hitler's favor. Between 1930 and 1933 there were five parliamentary elections. Through the course of these elections, the Nazi party established themselves as the largest single party in the Reichstag. The deepening recession coupled with increasing unemployment, communists fighting anti-communists on the streets, and Cabinet crises, resulted in Hitler's appointment as Chancellor. President Hindenburg and the German Right thought they were being clever in using Hitler against the Communists, who were also gaining political numbers. Hitler played on the feelings of oppression felt by most Germans as a means to unite them in his cause. In his writings and speeches, he tirelessly argued that the Jewish population in Germany was responsible for the country's woes. He claimed that Jews were fixed on the exploitation of economic resources and systems of all people

everywhere. Germans, who had long nurtured anti-Semitic feelings, looked around and saw affluent Jews who were untouched by the economic hardship of other Germans. Hitler claimed that the Jews were siphoning off national wealth that should have been distributed among hard working German workers and peasants. The Nazi invitation to smash the Jews had a double appeal – it offered a means to vent pent up feelings of desperation and at the same time the possibility of ending economic hard times.

Nazi ideology was anchored in Romantic irrationalism. Instinctive urges and feelings were honored above pure intellect. Hitler and his minions continuously denounced reliance on logic and the human conscience. They considered logic to be a foolish game, and the human conscience an unnecessary vestige of foolish guilt feelings. In place of logic and conscience, they promoted the notions of intuition and iron will. The Nazi ideology laid claim to the Spencerian Darwinist theory of survival of the fittest. To the Nazi's 'fittest' meant the active destruction of the unfit. The struggle to survive and increase in strength was, for them, the essence of the meaning and glory of life. And survival, by any means, was justifiable. The means and ends were interchangeable.

Philosophically, many of the Nazi elite were attracted to Friedrich Nietzsche. Although Nietzsche would have likely rejected Nazi-ism, his concept of power and his rejection of both Christianity and support of the weak in society were adopted to their extreme by the Nazi party. As the Nazis saw it, German society exalted the weak (which they considered evil) and scorned the good (the Nazis considered 'good' to be the absolute use of power). Hitler was also a fan of the pessimistic philosopher Arthur Schopenhauer and the music of Richard Wagner (who was also adored by Nietzsche). Until the pressures of the war became consuming, Hitler regularly attended Wagnerian

operas. Wagner's operas portrayed all the ingredients of the Nazi creed – the mystic dynamism of the Volk, anti-intellectualism, anti-Semitism, and rule by the elite.

Once Hitler was appointed Chancellor, he moved quickly. A bill was presented to the Chamber empowering the government to decree laws when national interests required it. In order to gain approval for the bill, Hitler outlawed the Communist party and denied its representatives their seats in the Chamber. The Enabling Act was approved 441 to 84. Ignoring his promises to use the Act sparingly, Hitler immediately used his new power to disband all political parties except his own. All of Germany's sixteen states were stripped of autonomous powers and came under the rule of Nazi-appointed governors. A new judicial system was imposed. In order to control his image with the German masses, Hitler appointed his Nazi compatriot, Dr. Josef Gobbels, as the head of the newly formed Ministry of Propaganda and Enlightenment. Gobbels immediately gained control over the nation's newspaper, periodicals, radios, cinema, theater, literature, art, music organizations and activities. The German people were fed nothing but Nazi propaganda.

As Nazi aggression spread through Europe, many of the intellectuals of Austria and Germany escaped to other western countries, including the US. Einstein, who so dramatically changed our view of the world in 1905, resigned his position in Berlin in 1933 and moved to America. Over the course of the next six years Hitler extended his control, eliminating any opposition, setting up concentration camps, establishing the dreaded *Schutz Staffe* (protective squads) or SS, empowering the Gestapo, and annexing his neighboring states. In 1935 he unilaterally denounced the section of the Versailles treaty that limited German armed forces to 100,000 men. He then instituted a formidable conscript army. In 1936 he marched on Rhineland along the border with France and both

Hitler and Mussolini supported General Francisco Franco's insurrection during the Spanish Civil War. In 1938 Hitler absorbed Austria into the borders of the Greater German Reich followed by the invasion of Czechoslovakia. In 1939 Hitler signed a pact of non-aggression with Russia and he turned his attention to Poland. On September 1, 1939 Hitler invaded Poland. After two days of incursion, Britain and France finally honored the guarantees they had made to Poland to protect the Poles from German invasion and declared war on Germany. World War II had begun. Germany and Russia split Poland and the Soviet forces headed north, invading Finland on November 30.

On the night of November 9, 1938 Hitler revealed the extent to which he would go with his racist doctrines. A Jewish boy, angered over the Nazi mistreatment of his parents, shot and killed a German official. The Nazis responded by unleashing Nazi Storm Troopers on the Jewish population. All over Germany Storm troopers smashed windows in Jewish shops, hospitals, and orphanages, and burned synagogues. They beat up thousands of Jews, and raped and murdered an unknown number. An additional thirty thousand were rounded up and shipped off to concentration camps. Jewish property was seized and Jews were excluded from all but the most menial forms of employment. The government later confiscated any insurance money paid to Jews whose businesses were destroyed and collectively fined the Jews a billion marks for provoking the attacks. Nazi prosecutors ignored the murder of Jews, but rapists were sternly punished because they violated the law forbidding sexual intercourse with Jews (Davies, 1996; Davis, 2004; Faragher, Buhle, Czitrom, & Armitage, 2000; Stipp, Dirrim, & Hollister, 1972).

America responded to these events with caution. Americans had adopted a strong isolationist sentiment following World War I. In 1933, 39 percent of college students

who were polled stated they would refuse to fight in any war and 33 percent would only fight if the US was attacked. In 1936, 500,000 students staged a nationwide student strike, boycotting classes as a demonstration of the opposition to any preparation for war. According to a Gallup poll in 1937, nearly 70 percent of Americans felt that US involvement in WWI had been a mistake.

When Einstein learned in 1939 that two German physicists had split the uranium atom, with only a slight loss of total mass that was converted to energy, he realized the significance of the discovery. After discussing the implications with colleagues, Einstein wrote a letter to President Franklin Roosevelt, in which he described the danger of a weapon based on the fission of the uranium atom in Nazi hands. The president responded politely, but did not tell Einstein, a committed pacifist, that he had taken his advice seriously. In 1939 Roosevelt funded the most expensive scientific research program up to that time – the Manhattan project. The result was the development of the atomic bomb, which was used to defeat the Japanese (Van Doren, 1986).

Meanwhile, Roosevelt was faced with a Congress of which two-thirds opposed even economic sanctions against Germany. He felt sure that the US needed to prepare for war. He was finally granted \$1 billion in appropriations to expand the navy. As late as 1939, in his annual address to Congress, he was still arguing that the US must use all means to deter aggression.

Calculating that America would remain in isolation, Hitler started a *Blitzkrieg* (lightning war) in April 1940 in an effort to gain control of all of western Europe. After taking Denmark, Norway, Holland, Belgium, and Luxembourg, British troops were forced to retreat across the English Channel from Dunkirk. Hitler's forces then combined

with Italian troops and conquered France in June 1940. Hitler then turned toward England. Even with Nazi bombers attacking population and industrial centers in Great Britain, opinion polls indicated American resolve to stay out of the war. But most Americans, including Roosevelt, felt that American security depended on a strong defense and the defeat of Germany. Invoking the Neutrality Act of 1939, Roosevelt began shipping arms and surplus planes and equipment to the Allies.

Then, on June 21, 1941 Hitler shocked his Russian ally. With France defeated and Britain struggling, Hitler felt prepared to take on the Soviet Union, allowing him to gain control of the last great continental state and bring with it the capitulation of Britain. Hitler launched an attack, sending three million men to fight in Russia along a 2,000-mile front. He carried out a three-pronged attack with forces targeting Leningrad, Moscow, and Kiev. His main objective was not territory; it was the capture and annihilation of Russian manpower. His plan was to move quickly and defeat Stalin before the cold Russian winter set in. Stalin was shocked, despite the fact that he had received numerous warnings and intelligence reports that indicated Hitler's intent. The Russians were ill prepared for a blitzkrieg. By fall, the Germans had encircled Leningrad in northwest Russia and had conquered half the wheat lands of Ukraine. Of the six million Russian troops captured over half died at Nazi hands. Hitler cut off supplies to Leningrad and let the civilians die of starvation. Over a third of the city's population perished.

In September, Roosevelt instituted the first peacetime draft and sent 1.4 million men to army training camps, still claiming it was for defensive purposes only. The US had still not accepted the fact that they would be required to go to war. The rhetoric for

preparedness was geared only toward defensive posturing. While Roosevelt worried about Germany, he had to keep his attention on Japan as well.

Throughout 1940 and 1941 Japan mounted an ever increasing campaign of aggression in Asia. Anticipating danger to American interests in the Pacific, Roosevelt transferred the Pacific Fleet from bases in California to Pearl Harbor in May 1940. In September 1940, Japan formally joined in a pact with Germany and Italy. Under the terms Germany would support Japan's seizure of Dutch, British, and French colonial possessions in the Pacific. America stood aside as Japan became more aggressive. But when Japan occupied Indochina in July 1941, Roosevelt responded by freezing Japanese assets in the US and prohibiting the shipment of oil supplies. Then, on December 7, 1941, Japan attempted to destroy the U.S. fleet in one blow with an early morning attack on Pearl Harbor. Within two hours Japanese pilots destroyed nearly 200 U.S. planes, badly damaged the fleet, and killed more than 2,400 Americans. On the same day Japan also attacked U.S. bases on the Philippines, Guam, and Wake Island. On December 8 Congress declared war against Japan. Hitler responded by asking the Reichstag on December 11 to declare war on the 'half Judaized and the other half Negrified' US. Mussolini joined him in the declaration of war. The Americans were now involved in WWII.

The war raged until 1945 when the Allies finally crossed the Rhine and took control of the Ruhr valley with its closely guarded industrial resources. Hitler committed suicide and Germany surrendered on May 8, 1945. Unfortunately Roosevelt did not live to see the victory; he died of a stroke on April 12, 1945. His successor, Harry S. Truman, took office and the US turned its full attention on the war in the Pacific. By 1945 the

Japanese were losing ground and were prepared to end the fighting if the Allies would set aside the stipulation of unconditional surrender. However, on August 3, 1945 Japan wired its refusal to surrender. Three days later Truman ordered the atomic bomb dropped on the Japanese city of Hiroshima. The bomb instantly killed 80,000 people; in the following weeks thousands more died of radiation poisoning or burns. A second bomb was dropped on Nagasaki. The Japanese surrendered on August 14.

The cost in lives of WWII was enormous; by the time the war was over, it is estimated that between 40 and 50 million people died – four times the number in WWI – and half the casualties were women and children. More than 405,000 Americans were killed and more than 670,000 were wounded. The atomic bomb may well have been the worst aspect of the war. In addition to ending the war with Japan, the bomb taught us something new. For the first time in history, human beings possessed the power to destroy the entire world with the flick of a finger. Editorialists in Japanese papers and leading religious publications in the US denounced the dropping of the bombs as a crime against God. Shortly after the war, the world also learned about the atrocities committed in the Nazi death camps and in Japanese POW camps (Davis, 2004; Melvin, 1946; Faragher, Buhle, Czitrom & Armitage, 2000; Roberts, 1999; Stipp, Dirrim, & Hollister, 1972).

Post World War II Europe

Europe was left wracked in the aftermath of the war. The enormous destruction wrought by the war left a clear sign that the post-war European world would have to be built anew. Only the neutral states of Ireland, Portugal, Sweden, and Switzerland had escaped serious damage. In addition to material damage, Europeans were left

psychologically damaged. Severe economic depression followed by full-scale war killed millions, destroyed homes and industries, and left unknown numbers of people homeless, including children. The United Nations Relief Fund and Rehabilitation Administration took over the care of 50,000 abandoned children in Germany alone.

Europe and America were left scarred as they were forced to face the reality of Hitler's death camps. In all, there were an estimated six million Holocaust victims. In 1939 Hitler escalated his anti-Semitic rhetoric. For years Jews and other 'undesirables' disappeared from society. Starting in 1941 the Nazi program turned toward wholesale slaughter of the Jews. The world turned a deaf ear and a blind eye toward the pleas for help. Prior to the end of the war, there had been a number of eyewitness accounts of the genocide program the Nazis were carrying out. On an individual level, Europe's response to the Holocaust ranged from the depths of depravation, to apathy, to the heights of heroism.

Governments adopted a variety of responses to the genocide. In Copenhagen, King Christian wore the Star of David armband in protest over treatment of the Jews. Most of Denmark's 300 Jews were able to escape. In Romania, where hundreds of thousands of Jews were killed by local authorities, the government resisted handing Romanian Jews over to the Nazis. In France, the Vichy regime took the lead in collecting 'alien' Jews, yet protected French Jews. The French Protestant Churches registered protests and the French Resistance took measures to disrupt the deportation trains. In Holland and Poland most of the Jews were lost. In Hungary, which resisted German occupation until 1944, a Swedish diplomat, Ralph Wallenburg, organized many Jewish escapes. His efforts resulted in his disappearance into a Soviet detention camp following

the war. Overall, however, most of the countries of the world, including the US, closed their borders to people fleeing the advancing onslaught of Nazi terror.

One of the problems was the refusal of the outside world to understand the enormity of Hitler's campaign. Entrenched in their own problems, they ignored the problems of people and nations beyond their own borders. There were, however, signs that required effort to ignore. As early as 1940, Witold Pilecki, an officer in the Polish Underground, succeeded in penetrating Auschwitz I. He spent two years organizing resistance cells within the camp before escaping. His reports, however, were not judged credible outside of Poland. By 1942, articles in magazines, newspapers, and journals highlighted many of the atrocities of the Nazi regime and people still had difficulty accepting the magnitude of the genocide and the enormity of Hitler's intent.

During the Nazi era, Germans who resisted Hitler were persecuted. One man who dared speak his mind was Martin Niemoller, a Lutheran pastor in an upscale suburb in Berlin. Niemoller was a decorated officer in WWI, earning two Iron Crosses for valor. He originally supported Hitler and stood aside as he took action against various groups in Germany. He did not speak out in protest until after Hitler took control of the Protestant Church in Germany. He was arrested in 1937 for speaking out against Hitler during a sermon. He spent the next eight years in concentration camps and was kept alive only because Hitler did not want to incur the wrath of Germans and the international community for executing him. He was liberated from Dachau in 1945 by Allied troops. After the war Niemoller became a committed pacifist, speaking out for individual freedom and in opposition of nuclear weapons. He gave many speeches and often ended with these words:

They came first for Communists –
and I didn't speak up because I wasn't a communist.
Then they came for the Jews –
and I didn't speak up because I wasn't a Jew.
Then they came for the trade unionists –
and I didn't speak up because I wasn't a trade unionist.
Then they came for the Catholics –
and I didn't speak up because I was a Protestant.
Then they came for me –
and by that time no one was left to speak up
(Niemoller, as cited in Davis, 2004, p. 321).

Niemoller started a Christian Confession group and called for the confession of all Germans for ignoring the atrocities perpetrated in the name of German nationalism. He incurred the wrath of many for his claim that after Hitler, Harry Truman was the greatest murderer of all time for his orders to drop the atomic bomb on Hiroshima and Nagasaki (Davis, 2004; Roberts, 1999; Stipp, Dirrim, & Hollister, 1972).

Niemoller held himself and other Germans accountable for placidly accepting Hitler's program of social cleansing. Those who carried out his orders and did the killing were ordinary soldiers and civilians. For example, members of the German Reserve Police Battalion 101 were all non-party, middle-aged, mainly working-class conscripts from Hamburg, which was one of the least Nazi-party-dominated cities in Germany. The Battalion was stationed in the Polish village of Jozefow in July, 1942. On the morning of July 13 the men were called out before dawn and ordered by their SS officers to seize all the able-bodied Jewish men in the town, and to shoot all the women, children, and elderly men. On that day alone over 1,500 people were killed. By the time their job in Poland was completed, the members of the Battalion were responsible for the outright killing of over 83,000 people. Between 1962 and 1972 West German prosecutors examined ex-

members of Battalion 101. Almost all expressed revulsion of their duties, but most claimed to be innocent of direct killing, although most had taken part (Davies, 1996).

Only after the war was over, did the whole world learn about the atrocities against human life and dignity carried out in the Nazi death camps. As Allied troops broke down the barbed wire and barricades of the Nazi death camps, they found proof of the individual stories that had been shared throughout the war. In addition to the camps, documents and pictures were discovered that verified the magnitude of Hitler's campaign to cleanse the German race of those he considered unfit or 'under-men'. Hitler carried his hatred of the Jews to the end. Knowing the end was near and with Russian troops outside his bunker, Hitler ordered his cherished dog and puppies poisoned, wed his mistress, and then the two of them committed suicide on April 30, 1945. He left a brief will and testament and orders for the burning of their bodies. In his testament he claimed

It is untrue that I, or anyone in Germany, wanted the war in 1939. It was desired and instigated solely by those international statesmen who were either of Jewish descent or who worked for Jewish interests...I die with a happy heart, aware of the immeasurable deeds of our soldiers at the front...Above all, I charge the leaders of the nation...to scrupulous observation of the laws of race, and to merciless opposition to the universal poisoner of all people, international Jewry (as cited in Davies, 1996, p. 1045).

Hitler escaped the fate of Mussolini and his mistress who had been murdered and then strung up by the feet the previous day in Milan. With Hitler and Mussolini dead, the long drawn out process of European reparation began.

ACT FOUR

Scene 8

JAKE: My dad fought in that war. I know it made an impact on him. But I have to admit that I can't see that it changed anything for the following generations. I think we'd be just as likely to follow a charismatic leader now as then.

BILL: It did make a difference in Europe. They all had to live with the war and work on recovery after the war. Here in the US only the soldiers really felt the impact. The rest of the U.S. population was pretty insulated. Heck, we even prospered because of the war.

MINERVA: Let's discuss the differences...

Post World War II European Philosophy

Following the spectre of war and the threat of annihilation, philosophers emerged to sort out the human condition, all of whom grew up under the influence of post-WWI sentiment. American philosophers and European philosophers appear to have adopted two distinctly different philosophic traditions. America had escaped the devastation of WWII and had actually prospered as a result. The war was romanticized and Americans saw themselves as the victors. With nothing forcing them to face their underlying assumptions, Americans continued to hold science in high regard and maintained an empirically-based philosophical system. European philosophers, on the other hand, adopted a broadly non-scientific orientation.

Edmund Husserl (1859-1938) influenced many of the notable European philosophers of the twentieth century, including Gadamer, Heidegger, Marcuse, Sartre, Ricoeur, and Derrida, among others. Husserl spent most of his career trying to make sense of what science *means*, both as a practice and as an ideal. Husserl did not abandon the ambitions of science; he opposed the manner that scientific practice distorted our normal connection with the familiar ‘life-world’ (Moran, 2000).

Husserl was concerned that the success of the fact-minded sciences in the nineteenth century had led to a generation of fact-minded people who fail to ask questions related to the self-determination of human existence. Husserl labeled his philosophy ‘phenomenology’ and saw it as a method that brought out aspects of experience and consciousness without incorporating traditional metaphysical assumptions. Husserl died in 1938. As a Jew the Nazis had persecuted him. His one-time assistant Martin Heidegger built on Husserl’s efforts and incorporated the philosophies of Soren Kierkegaard (1813-1855), who opposed rational philosophy and theology, and Friedrich Nietzsche (1844-1900). Nietzsche was an atheist who claimed ‘God is dead’ – he developed a philosophy in which there are no moral facts, only different ways of representing the world. Man could choose to be a master or a slave, but the choice is his. Nietzsche’s philosophy is marked by a reckless abandon of all social norms. He described the world as devoid of intrinsic purpose and rejected the purpose of any external moral guides in a world where conditions were in flux (Forese, 2001).

As a result of his philosophic views, Heidegger became one of the darkest of the existential thinkers. During the Nazi period Heidegger supported Hitler, joined the Nazi party, and was made rector of the University of Freiburg and subsequently banned

Husserl, his former teacher, from using the library. One year later, in 1934, Heidegger resigned the rectorate and took no further part in politics. His inaugural rector's address was devoid of the biologism and anti-Semitism that supported the Nazi party; the Nazis subsequently banned his speech. In his lectures of the late 1930s and early 1940s he was critical of Nazi ideology. During this same period Heidegger offered courses on 'the essence of truth' and became fascinated with the question of language and its use. In 1944 he was deemed the most 'expendable' of the faculty and sent to the Rhine to dig ditches. Because of his political involvement and the ambiguity of his attitude toward Nazism his philosophy became quite controversial. From 1945 to 1949 he was banned from teaching.

Heidegger claimed that the basic goal of philosophy is to discover the nature of *Being*. According to Heidegger, human beings are present in the world and are affected by their circumstances, that life has no ultimate purpose other than to be lived, and that in the absence of purpose there is total freedom. He claimed this freedom then results in a sense of guilt over what we could have created, but didn't (Korab-Karpowicz, 2001; Popkin & Stroll, 1993; Scruton, 1995).

Heidegger's dark and oppressive philosophy was adopted by a disparate group of French philosophers. From 1932-1934 Jean-Paul Sartre (1905-1980) studied the theories of Husserl and Heidegger. Sartre's abilities in the writing of plays, novels, and essays propagated existentialism into the public realm. Rather than looking to religious faith, Sartre promoted a humanist philosophy as a way of dealing with one's experiences so as to make life meaningful.

Sartre was born in France and graduated in 1929 from the Ecole Normale Supérieure. After teaching philosophy in a lycée in Le Havre, he obtained a grant to study at the French Institute in Berlin, where he discovered the field of phenomenology in 1933, and wrote *The Transcendence of the Ego*. Adopting and adapting the philosophy of phenomenology, Sartre set out to develop an ontological account of what it means to be human. During WWII he wrote *Being and Nothingness* (published in 1943) and taught the philosophy of Heidegger in a war camp (Onof, 2004).

In his *Existentialism and Humanism* (1946) Sartre argued that there are two kinds of existentialists: Christian existentialists and ‘existential atheists’ – and he grouped himself and Heidegger into the last. According to Sartre the two groups share in common the view that existence comes before essence. In other words, humanistic existentialism can be defined by its premise that “human beings do not have a pre-determined nature that makes them what they are prior to their engagement in the world” (Sedgwick, 2001, p. 168). In addition, since he was an atheist, Sartre claimed that what we as human beings cannot be defined in relation to a divinely-articulated notion of ‘human nature’ that exists prior to each of us being born. We become what we are through concrete experience. “Thus the first effect of existentialism is that it puts every man in possession of himself as he is, and places the entire responsibility for his existence upon his own shoulders” (Sartre, as cited in Sedgwick, 2001, p. 168). In this manner, Sartre’s philosophy supported the behavioral school in psychology.

Heidegger also influenced the German philosopher Hans-Georg Gadamer (1900-2002). Gadamer received his doctorate at age 22 from the university at Marburg. Gadamer met Heidegger in 1923 and became his assistant, completing his second

doctorate (again on Plato) under Heidegger's direction. During the war Gadamer neither supported nor opposed the Nazi party, accommodating himself first to nazism and later to communism. After the war Gadamer moved to West Germany. His *Truth and Method* (1960) is likely his most famous work. In *Truth and Method*, Gadamer argued that experience, culture, and prior understanding make it impossible to be scientifically objective. In fact, humans live in a world that is subject to constant interpretation. A historian's own 'prejudices' affect his or her own interpretation of history. Gadamer envisaged the role of hermeneutics to be the examination of such prejudices – how they are displayed in language and how they evolve. In the years following the publication of *Truth and Method* Gadamer engaged in a number of public debates, most notably with Emilio Betti, Jurgen Habermas, and Jacques Derrida (Malpas, 2003).

Influenced by Kantian phenomenology, existentialism, and Freudian philosophy, Jacques Derrida (1930-2004) picked up the banner of humanism and carried it into language construction. Distancing himself from the various philosophical movements dominant among French intellectuals (phenomenology, existentialism, and structuralism) Derrida developed a strategy of critiquing philosophy and written text. Derrida's name is inextricably associated with a movement referred to as deconstruction, and is counted as one of the most controversial of the post-war European thinkers.

Derrida was born in Algiers; began studying philosophy in 1952 at the Ecole Normale Supérieure in Paris, where he later taught from 1965 to 1984. Between 1960 and 1964 he taught at the Sorbonne in Paris. From the early 1970s on he divided his time between Paris and the US, teaching at U.S. universities, such as Yale, John Hopkins, and the University of California at Irvine. Derrida's work focused on language.

Through his work in linguistics, Derrida strived to demonstrate the subjectivity of any text, verbal language, or sign, and thereby the arbitrariness in all philosophical language. According to Derrida there is no one right true meaning in any thing, including scientific endeavor. Meaning is generated only out of personal experience. All meanings and truths, therefore, are not absolute or timeless, but are framed by socially and historically specific conditions of knowledge. The result is a radical relativism. The aim of deconstruction is to discover hidden assumptions in text. These assumptions are buried in the knowledge resident in the society, culture, or language in use at the time of the writing. Text, in other words, cannot be interpreted at face value based on the knowledge and cultural context held by a specific reader. The implication is that all belief systems, no matter how 'rational' they may appear, are open for critique.

In *White Mythology* Derrida argued that philosophy, and in particular, metaphysics, is built on the use of metaphors and that it is impossible to attain any degree of control over metaphor. He claimed that

Although metaphysical metaphor has turned every meaning upside down, although it has also effaced piles of physical treatises, one ought always be able to reconstitute the original inscription and restore the palimpsest [the original piece on which the old writing has been rubbed out to make room for new]...By an odd fate, the very metaphysicians who think to escape the world of appearances are constrained to live perpetually in allegory. A sorry lot of poets, they dim the colors of the ancient fables, and are themselves but gatherers of fables. They produce white mythology...

What is metaphysics? A white mythology which assembles and reflects Western culture: the white man takes his own mythology (that is Indo-European mythology), his logos – that is the mythos of his idiom, for the universal form of that which is still his inescapable desire to call Reason...

What is white mythology? It is metaphysics which has effaced in itself that fabulous scene which brought it into being, and which yet remains, active and stirring, inscribed in white ink, and invisible drawing covered over in the palimpsest (pp. 10-11).

Since there can be no 'rational' command over the expressive power of metaphor, then there is nothing which would enable science to distinguish between 'bad' and 'good' examples. In effect, Derrida's goal in writing *White Mythology* was to

deconstruct the concept/metaphor distinction to the point where philosophy becomes just a species of rhetoric (or 'kind of writing'), and where science can be shown to consist in nothing more than a range of 'pre-scientific' tropes and images masquerading as hypothesis, proof, inductive warrant, law-governed causal explanation, etc. (Norris, 1997, p. 15)

Derrida specifically criticized the work of the Swiss linguist Ferdinand de Saussure (1857-1913). Saussure had constructed a system that provided, in his estimation, a scientific account of the process of signification (how words represent meaning). According to Saussure, a sign (word) is held to possess a meaning as a direct consequence of its relationship to other words with which it is associated, especially in terms of differences (e.g. good/bad, light/dark, etc). Derrida viewed structuralism as a system that rendered meaning as something ghostly, disconnected from human experience. It is interesting to note, that by way of clarification, Derrida offered a metaphor of a deserted city to illustrate his point

Thus, the relief and design of structures appears more clearly when content, which is the living energy of meaning, is neutralized. Somewhat like the architecture of an uninhabited or deserted city, reduced to its skeleton by some catastrophe of nature or art. A city no longer inhabited, not simply left behind, but haunted by meaning and culture (Derrida, as cited in Sedgwick, 2001, p. 196).

Derrida's point is that the structuralist conception of meaning requires that the entire structure be revealed. The possibility of full revelation cannot be demonstrated. What makes a city a city is that it exhibits signs of life. In the same way, meaning is not a structural totality. Words and signs make sense only if they exist in context of life force.

‘Meaning’ is not equivalent to ‘structure’. The metaphor and meaning are products of cultures (Derrida, 1969; Lechte, 1994; Norris, 1997; Popkin & Stroll, 1993; Sedgwick, 2001).

Postwar European Culture

Europeans survived WWII as a civilization, but many intellectuals were convinced that its cultural predominance was over. Immediately following the war, there was a flurry of books published that described the ‘end of the European age’. Political and economic power shifted to the United States and it was assumed that all cultural activity would follow suit. With WWI still a recent memory, the Second World War further entrenched a sense of despair and insecurity into the European psyche. Ernst von Salomon’s *Questionnaire* (1946) became a best seller in Germany, in which he expressed the view “that man had been reduced to a few lines on a questionnaire” (Mosse, 1988, p. 396). Salomon rejected all ideologies, claiming there was no difference between Hitler and the democracies – both created a situation where the individual man was minimized. The only solution, therefore, was membership in a powerful elite – membership that did not require one to think. Salomon conjectured that ‘to do nothing’ was the only realistic attitude – bravery and stupidity were really the same thing. He accepted and promoted a nihilism of despair. According to Salomon, technology had reduced man to a cipher. Ideas such as these, remnants of the nihilism that spread through Europe following WWI, were common.

Other publications, such as Vigil Gheorghiu’s *Twenty-Fifth Hour* (1949) and Curzio Malaparte’s *Kaputt*, both best sellers, added a fear of technology to European nihilism. Along with Salomon, Gheorghiu claimed that the application of technology to

the social sciences had reduced man to a meaningless variable in an equation. To demonstrate the truth of these premises writers turned to the US as an example.

European intellectuals held to the old distinction between culture and civilization; civilizations being merely the external state of which humanity is capable, while culture possesses a soul. To demonstrate the difference between culture and civilization, European writers pointed out the depersonalized nature of the United States technological society. Robert Jungk portrayed this viewpoint in his book entitled *The Future Has Already Begun* (1949), which went through nine editions in two years. Jungk described Americans as “displacing their churches with skyscrapers and claimed that the president consulted a ‘thinking machine’ for his political decisions. The United States was pictured as helpless before the technology which it had created” (Mosse, 1988, pp. 396-397). Jungk expressed a fear that the human soul would be swept under by the forces of technological change. Technology was blamed for man’s alienation from society and as a force that led to man’s depersonalization.

Existentialism grabbed hold of the European mind. In *The Wall*, Sartre argued that man must act without hope. Albert Camus (1913-1960) wrote about the necessity of knowing evil in order to understand how to determine one’s own fate. The external world had to be understood and controlled. Fate was a human matter and was determined by the actions of men. Camus’s personal experience in the Resistance during the war gave him tremendous moral authority. His novels *The Stranger* (1942), *The Plague* (1947), and *The Fall* (1956) revolved around metaphors for the war. He revealed humanity’s responsibility for its own dilemmas and explored the limits of the ability for us to help

one another. The theme of individual helplessness was portrayed in George Orwell's *Animal Farm* (1946) and *1984* (1949).

The books of Arthur Koestler (1905-1983) brought together the negation of moral values with nihilism and cruelty. In his *Thieves in the Night* (1946) he rejected the validity of ideology and moral value in favor of the reality of force. European society appears to have become obsessed with the idea of cruelty. Popular literature shifted. George Orwell contrasted earlier literature with the type of literature popular in the 1940s, noting that cruelty and sexual perversion began to appear as dominant themes.

As the psychological and behavioral sciences became more popular following the war, psychology, as expressed by Freud, came to dominate literature. Psychology could explain everything, and if a behavior could be explained, then it could be condoned it. Psychology provided a supposedly 'scientific' explanation for evil. Cruelty and sexual perversion were natural outlets for a suppressed Id. It was not technology or totalitarianism that was the enemy – it was sexual frustration. Psychology was romanticized and became an ideology of its own.

The failure of bourgeois society to maintain a European culture resulted in a rejection of Victorian ideals. If the outward world no longer made sense, then how could the morality to which it was dedicated make sense? Following the failure of society to maintain its moral code during two successive world wars, then why maintain any moral code? Attempts to hide the human body were frowned upon; literature leaned toward a realism that bordered on pornographic (Coffin, Stacey, Lerner, & Meacham, 2002; Mosse, 1988).

Religious life experienced a serious decline. Wartime horrors coupled with post-war materialism provided a full-scale onslaught on people's faith. A new psychological and moral relativism emerged suggesting new explanations of what were previously taken to be matters of religion. Church going ceased to be a social convention. Semi-deserted churches became a common site throughout urban, suburban, and rural areas of Europe. Protestant England and Catholic France both realized a decline in attendance and adherents to Christian doctrine. For the first time in 1,500 years, Christianity was becoming a minority belief in Europe. The response was ecumenism. In 1948 the World Council of Churches, headquartered in Geneva, brought together the main Protestant and Orthodox Churches in an attempt to encourage voluntary co-operation. Vatican II, which held four sessions between 1962 and 1965, officially supported the ecumenical movement, although the Roman Catholic Church has never joined the Council. Despite attempts to re-invigorate the Protestant and Catholic Churches in western Europe, membership continued to decline. By the end of the twentieth century most Roman Catholics in the world were non-Europeans (Davies, 1996; Roberts, 1999).

The decline in religious fervor was coupled with scientific advances that affected all of western culture. Following the war, a variety of wartime technological innovations were applied to peacetime applications. Improvements in communications, the manufacture of synthetic materials, and increased productivity provided for a postwar boom in Europe. France, Britain, Italy, and Austria took the lead in state controlled enterprises. France brought many of its industries under state management. Backed by government dollars the European economy flowered, supporting with it a rapid expansion in population. The population turned to a society of mass consumption. The film industry

flourished. Artistic films reflected the literature of the period: loneliness, war, and corruption. Lifting taboos cleared the way for powerfully realistic films.

By 1965 the television was present in 62 million homes in the US, 13 million in Britain, 10 million in West Germany, and 5 million each in France and Italy. American programs were imported with the same alacrity as other American products. Despite the objection of many cultural critics, television, with its American overtones, became a fixture of Western European homes. Electronic media became a means to transfer culture from one country to another. Music, and most notably 'rock and roll' represented a melding of various cultures. The 'British invasion' of bands blended with American sounds and stars. Eastern influences were absorbed through the arts and a political agenda was supported through a folk-music revival. Recording studios became corporations as powerful as manufacturing enterprises. Rock and roll became a bridge over the division created by the Cold War.

(Abby and David get up and excuse themselves the leave the room)

ADAM: The sixties and seventies were really something. I like hearing about them

because its funny to think of my grandparents as hippies! But I'm glad I wasn't born then – I'd have had to deal with the Vietnam War and that sounds like it was terrible.

BILL: Now you're making me feel old, Adam. I was your age in 1965, and you're right – times were pretty much in turmoil back then.

JAKE: Well, I'm only 40, so I wasn't born till 1965, but I think the 60s and 70s were

messed up. If you are 60 now, Bill, then you were born in 1945. You never saw the war, so how could your generation have such a negative reaction to Viet Nam? The entire country was in an uproar. And I am sick of hearing about the baby boomers. That generation has been crying for attention ever since it was born!

MINERVA: That's a strong reaction, Jake. Do you think the experience of one generation makes an impact on the next?

JAKE: Yes, but the people who fought in WWII all seem to be proud of their contribution. When the next generation of soldiers went to Viet Nam, others in their generation were protesting in the streets and spitting on the Nam soldiers and vets. You'd think they would have been taught national pride by their parents.

MINERVA: Keep in mind it isn't just the parents that make an impact. The reaction of the young people in the US in the 60s and 70s was also the result of other influences. The change in literature and music coming out of Europe caught up a whole new generation – all of whom had impressionable minds and no firm philosophical foundation.

DAVID: *(entering from the main hall)* Sorry to interrupt folks, but Abby has lunch waiting in the dining room. Take a break and we can pick this up later.

(everyone gets up and leaves the room engaged in quiet conversation)

(lights fade)

ACT FOUR

Scene 9

(lights up – everyone is sitting in their seats in the great room)

JAKE: I thought about our discussion over lunch. I can see why the WWII produced such a negative perspective in Europe. Their world was rocked by two major wars that were only about 20 years apart. I can't even imagine how demoralizing and depressing that would be. No wonder the people who lived through it developed a dark philosophy of life. But I still don't see how the youth movement in the US in the sixties had anything to do with European attitudes.

BILL: Well for one, look at the slippage in morals. Between the birth control pill and the hedonistic attitude that seems to come out in humans after major wars and plagues, it's no wonder we saw the problems in the sixties. We just lived up to centuries of human patterning.

JAKE: But I thought Americans went for the pragmatic, scientific stuff. What's up with all the free-love movement – sounds more like those European Romanticism writers.

BILL: And if you remember they were all fairly young. Rash action seems to be a passion of youth. We just have to live long enough to have our common sense return! WWII consumed an entire generation. We suffered less than most because we were in it for so short a time period and it wasn't fought on our shores.

MINERVA: Yes, and that experience embedded different perspectives into European and American minds. Science had failed the Europeans and was a hero to the Americans.

ADAM: So did philosophy on the two continents veer even wider apart?

MINERVA: The gap did widen, with some transfer of philosophy between the two...

Philosophy of Science

Prior to the outbreak of the war, a number of the philosophers from the Vienna Circle transported logical positivism to American Universities. The underlying methodology for logical positivism was the use of logic to formulate a grounded theoretical proposition based on facts or conditions, hypothesize what should be observed, and then test the hypothesis by comparing it to what is observed. Social scientists adopted logical positivism to frame the research questions in the behavioral sciences. Americans quickly adopted positivist philosophy, but rejected, for the time being, existential philosophy. Out of this developed the philosophy of science (Nodoushani, 2000).

“Whereas science is largely empirical, synthetic, and experimental, philosophy of science is largely verbal, analytic, and reflective” (Klemke, Hollinger, Rudge, & Kline, 1998, p. 25). The philosophy of science, therefore, is

the attempt (a) to understand the method, foundations, and logical structure of science and (b) to examine the relations and interfaces of science and other human concerns, institutions, and quests, by means of (c) a logical and methodological analysis both of the aims, methods, and criteria of science and of the aims, methods, and concerns of various cultural phenomena in their relations to science (p. 25).

Sir Karl Popper (1902-1994) is generally regarded as one of the leading philosophers of science of the twentieth century. Popper had a unique ability to influence scientists who would normally ignore the field of philosophy. He wrote with clarity on

the most technical scientific matters, and tackled the social issues of his day. He was a staunch opponent of all forms of scepticism, conventionalism, and relativism in science and in human affairs. He was a defender of an open society and an implacable critic of all forms of totalitarianism.

Popper was born in Vienna in 1902; he entered the University of Vienna in 1918 where he studied mathematics, physics, and philosophy. 1919 was a year of discovery for the young Popper. In that year he became heavily involved in left-wing politics, joined the Association of Socialist School Students, became disillusioned by the doctrinal nature of Marxism and rejected it, discovered the psychoanalytic theories of Freud and Adler, and listened to lectures by Einstein on his theory of relativity. The dominant theme of critical examination inherent in Einstein's lectures contrasted sharply to its total absence in Marx, Freud, and Adler; the latter only offering cases of confirmation while Einstein opened his theory up to testable implications, which, if false, would disprove his theory entirely.

Popper obtained his teaching diploma in 1925 and his Ph.D. in philosophy in 1928. He qualified to teach physics and mathematics in secondary school in 1929. The dominant philosophical group in Vienna in 1928 was the Vienna Circle. Although he was friendly with some of the members of the Circle, especially Feigl, who encouraged him to write his first book, he was critical of their position on logical positivism. He took issue with several of the tenets of logical positivism, most notably its focus on the theory of meaning in philosophy and its method of verification in scientific methodology. He wrote his views on logical positivism in his first book, titled *Logik der Forschung* in 1934. The book attracted attention and Popper was invited to lecture in England in 1935. He spent

the next few years working on philosophy and science, until, like many intellectuals of Jewish descent, he was forced to leave Vienna in 1937.

In 1937 Popper took a teaching position at Canterbury University in New Zealand where he remained until 1945. The annexation of Austria in 1938 prompted him to turn his attention toward social and political philosophy. After the war he moved to England to teach at the London School of Economics. In 1949 he became professor of logic and scientific method at the University of London, where he remained until his retirement in 1969.

Popper was a prolific writer; his reputation and stature as a philosopher of science and social thinker grew over time. Popper was deeply impressed by the differences in scientific method demonstrated by Einstein and in contrast to Marx or Freud. The main difference between them, in Poppers estimation, was that it was possible to deduce consequences from Einstein's theory that were highly improbable, and which would, if they proved to be false, falsify the theory itself. Nothing could, in principle, falsify psychoanalytical theories. He came to view Marx's political theories and Freud's psychoanalytical theories as having more in common with primitive myths than with genuine science. He saw Freud's claim that psychoanalysis could explain all human behavior as a critical weakness since it could not be predictive. Popper also held that Marxism was not scientific. Although Marx postulated a theory that was genuinely predictive, when the predictions were not born out in fact, the theory was saved from falsification through ad hoc hypotheses that made it compatible with facts. By this means a genuinely scientific hypothesis was degraded into a pseudo-scientific dogma (Thornton, 2002).

One of Popper's most noted assertions is that scientific theories cannot be verified by observational evidence or by induction. Thus, regardless of the number of positive observations, one cannot draw a universal conclusion. For example, just because all observed swans are white is not a basis for concluding that all swans are white. There is therefore, an inherent limitation in the method of induction such that it cannot serve as a compelling basis for scientific procedure. In place of inductive methods, Popper argued for a hypothetico-deductive system as the basis for the falsification of theories. The task of scientists is the construction of theories and the deduction of testable consequences from them (as modeled by Einstein). A theory that is falsifiable is a successful scientific theory. In Popper's opinion, any theory that is not falsifiable is not a scientific theory.

According to Popper, the integrity of the scientific method is based on an honest quest for negative instances. The mark of nonscientific or pseudoscientific theories is that they are never falsifiable and tend to live on forever. Even a falsifiable theory is only temporarily supported, for any

subsequent negative decisions may always overthrow it. So long as a theory withstands detailed and severe tests and is not superseded by another theory in the course of scientific progress, we may say that it has 'proved its mettle' or that it is 'corroborated' by past experience...I never assume that we can argue from the truth of singular statements to the truth of theories. I never assume that by force of 'verified' conclusions, theories can be established as 'true', or even as merely 'probable'...

What are the rules of scientific method, and why do we need them? Can there be a theory of such rules, a methodology?

The way in which one answers these questions will largely depend upon one's attitude to science. Those who, like the positivists, see empirical science as a system of statements which satisfy certain logical criteria, such as meaningfulness or verifiability, will give one answer. A very different answer will be given by those who tend to see (as I do) the distinguishing characteristic of empirical statements in their susceptibility to revision – in the fact that they can be criticized, and superseded by better ones; and who regard it as their task to analyse the characteristic

ability of science to advance, and the characteristic manner in which a choice is made, in crucial cases, between conflicting systems of theories...

If you insist on strict proof (or strict disproof) in the empirical sciences, you will never benefit from experience, and never learn from it how wrong you are.

If therefore we characterize empirical science merely by the formal or logical structure of its statements, we shall not be able to exclude from it that prevalent form of metaphysics which results from elevating an obsolete scientific theory into an incontrovertible truth (Popper, 1985/1934a, p. 136-137).

Popper worked to establish rules by which scientists could conduct research and discovery in a manner that protected their work from the danger of falling into the realm of a pseudo-science. Popper knew that “objections [were] bound to be raised against [his] proposal to adopt falsifiability as [a] criterion for deciding whether or not a theoretical system belongs to empirical science” (Popper, 1985/1934b, p. 143). He knew that “The doctrine that the empirical sciences are reducible to sense perceptions, and thus to our experiences, is one which many accept as obvious beyond all question” (Popper, 1985/1934c, p. 152). Popper rejected this doctrine because of its basis in inductive logic, and argued that no proposition can be verified once for all.

Popper’s philosophy of science has been criticized on several fronts. Some believe that Popper ignores the history of science and the work of scientists. Critics claim that Popper arrived at his theory through abstraction rather than the careful study of how scientists have actually conducted their work. Others criticize Popper regarding his doctrine of falsifiability, claiming that his theory discouraged the search for legitimate auxiliary hypotheses when a theory is threatened by empirical evidence. In 1982 Phillip Kitcher, in his book *Abusing Science* provided an example where the application of Popper’s theory would have adversely impacted the advance of science. The behavior of Uranus could have been taken as a falsification of Newtonian theory, but astronomers

instead tried an alternative. They plotted the course of a hypothetical planet to explain the strange behavior of Uranus. Their hypothesis was later confirmed by the discovery of Neptune, which resolved the difficulties because the orbit of Neptune was consistent with the calculations worked out for the hypothetical planet.

It can be argued that Popper's falsifiability in scientific procedures, if extended to all scientific hypotheses, limits the range of what counts as legitimate science. His requirement that all genuine science be subject to falsifiability poses a difficult challenge for researchers in the behavioral sciences, where deductions about hypotheses are difficult to formulate (Klemke, Hollinger, Rudge, & Kline, 1998; Miller, 1985; Popper, 1998/1953; Viney & King, 1998).

The Cold War and Behavioral Sciences

The end of WWII ushered in a new chapter in the history of the world. Although allied during the latter part of the war, the US and Soviet Union were now faced with redrawing their lines. Conflict had existed between the two nations since the Russian Revolution of 1917; WWII had simply put the conflict on hold. Advances in war technology now produced a new threat. It was only the prospect of mutual destruction that kept the two nations from precipitating another war. The icy relations between the two nations came to be known as the Cold War (1945-1952) (Faragher, Buhle, Czitrom & Armitage, 2000).

The most urgent goal for policy-makers during the Cold War was to stop the spread of communism and prevent the thermo-nuclear destruction of the world. The political climate made it acceptable in the scientific community for science to continue being funded and controlled by the U.S. government. In 1950 Congress created the

National Science Foundation (NSF). The purpose of the agency has been to develop national science policy and to support scientific research and education. It was the intent of the Foundation that science would produce the necessary weapons and simultaneously generate peacetime applications for industry.

In 1946 the U.S. Air Force founded Rand (or RAND, an acronym for research and development) as a joint venture with Douglas Aircraft. Rand split off from Douglas in 1948; however, the Air Force continued to fund Rand at a rate of about \$10 million per year. Rand's mandate was to study techniques of air warfare. Then, in 1951 the social sciences (also referred to as the behavioral sciences) were funded through the Ford Foundation. The goal was a planned acceleration in the accumulation and use of knowledge of human behavior. Between 1951 and 1953 the Foundation granted over \$10 million to Universities and scholars to advance the education of behavioral scientists and research studies (Nodoushani, 2000).

In 1956 Rand began to diversify into other areas of defense. At its peak in 1957 Rand employed over 2,600 staff and paid salaries 50 percent higher than universities; as a result, Rand attracted top talent. Rand staff included social scientists, economists, mathematicians, physicists, and engineers. One of Rand's mathematicians, John von Neumann and a fellow economist Oskar Morgenstern invented game theory. The game asked the question how rational players of a zero-sum game would react to one another. The theory is based on maximizing possible gains and minimizing possible losses. It was a theory based on statistical probability. It was believed that von Neumann and Morgenstern had achieved the ultimate goal of a scientist – to theorize a rational solution to a human problem (Stanford University website).

In 1962 J.B. Wiesner, the President's Special Assistant for Science and Technology, released a report of the behavioral sciences that was produced at the request of the President's Scientific Advisory Committee. The report stated that "Behavioral scientists use the methods common to all sciences: observation, instrumentation, field and laboratory experiments, statistical analysis of data, construction of models and theories, and good, hard thinking" (Behavioral Sciences Subpanel Report, 1962, p.233). The behavioral sciences included every science related to the human experience, from biochemical and behavioral techniques to study the brain, to the work of sociologists and anthropologists dealing with institutions and cultures. The report emphasized the importance of behavioral science in solving human problems, changing the conception of human nature, and changing society. The final recommendation was to include all areas of behavioral and social sciences in the National Academy of Sciences-National Research Council and to encourage Federal agencies to use the resources of the Social Science Research Council, including those engaged in international affairs.

Vietnam and Operations Research

As noted earlier, war is a time of scientific discovery. During WWII young scientists were hired to aid military personnel in devising strategies to combat the enemy. Although a fledgling area of study during the 1940s, the approach quickly caught on as these scientists took their experience and expertise into private industry following the war. Operations research was once again applied during the Vietnam War. Operations research brought together natural scientists, social scientists, and mathematicians who applied quantitative analysis and game theory supported by new computer technology – war was reduced to algorithms, electronics, and kill ratios.

General Westmoreland, with full support from Secretary of Defense Robert McNamara, utilized operations research in Vietnam; based on analysis, he decided to wage a war of attrition. Westmoreland kept a tally of the body count of the enemy and reported it on a regular basis. Unfortunately, the strategy was a failure – it did not account for Vietnamese determination. What Westmoreland did accomplish was to incite the American people back home. The baby-boomers were coming of age between 1965 and 1971 and a large number of them engaged in protests against the war (Waring, 1991; Schulzinger, 1998; Faragher, Buhle, Czitrom & Armitage, 2000).

As the Vietnam War escalated in the mid to late sixties, Americans from all walks of life demanded an end to US involvement, especially those being called by the draft. The sixties generation was the largest and best educated in America so far. By 1965 college enrollment was at 5 million, and by 1973 it had doubled to 10 million. These students, amassed through the university system, began to voice their protest against Vietnam and a number of other issues in American society. Many students joined campus organizations that encouraged them to take a militant stand against the government. The generational rebellion took many forms, from the sexual revolution, to the drug culture, to the music.

Students also began to protest against the war-related research taking place on their campuses. The expansion of higher education in the 1960s was made possible through federally funded programs, including military research on counterinsurgency tactics and new chemical weapons. By the late sixties, the war protests spread beyond college campuses. Media pictures of violence against protestors and against the

Vietnamese had begun to sway the opinion of the American public against the government.

The years 1967 and 1968 were violent. The Americans reached a stalemate in Vietnam. The Tet Offensive by the North Vietnamese, although halted by U.S. military, caught them off-guard. The ferocity of the attack shattered the credibility of American officials who had repeatedly told the American public that the enemy was virtually beaten. 1968 also saw the assassination of both Martin Luther King and Robert Kennedy.

Promising to restore law and order, Richard Nixon won the presidential election in 1968. Nixon played on voter hostility toward youthful protestors and the counterculture. His election underscored the division within the US of liberal and conservative views. Promising peace with honor during his election campaign Nixon immediately turned and escalated the conflict in Vietnam. In 1970 Nixon added Cambodia to the war zone and ordered U.S. troops to invade, which triggered the largest series of demonstrations and police-student confrontations in the nation's history. The nation was shocked following police killings at Kent State and Jackson State University. Now even university leaders began to call for an end to the war.

The U.S. media, typically supportive of the government, began to take a stance against government actions in the late sixties. For years the Johnson administration had deliberately lied to the American public and used the news agencies to disseminate the misinformation. In 1970 Nixon ordered illegal wiretaps of news professionals. The media revolted. In 1971 the *New York Times* won its battle with Nixon to publish a book titled *The Pentagon Papers* that exposed the role of presidents and military leaders in deceiving the public and Congress about US conduct in Southeast Asia.

The door was now wide open for a new set of philosophers in the US. The work of semioticians came spilling to the forefront. The government's experiment in social engineering had failed. The public was now aware of the manipulative behaviors used to engineer society. Science was discredited. The war ended in 1972. In 1974 Nixon resigned in the face of certain impeachment for the Watergate scandal. America was left with a lingering bitterness over the defeat in Vietnam. The nation was left feeling cynical and psychologically at war with itself (Faragher, Buhle, Czitrom & Armitage, 2000).

A New Perspective in the Philosophy of Science

Ackoff (1973) proposed that we began to enter the *systems age* in the 1940s, and that old paradigms of the scientific method were not suited to human systems. The most appropriate model, Ackoff argued, was the new understanding we were developing in the study of biological systems, which were also being used to frame the research in cybernetics. His claim is that the systems age is teleologically oriented – that systems are goal oriented, purposeful, and have choice of means or ends, or both. However, in 1966 Ackoff, a leading proponent of Operations Research, commented that “a common mathematical language must be developed to deal with all aspects of organization: content, structure, communications, and control...with these developments science will be able to deal with organizations in the round, not merely with slices of them” (Ackoff, 1966, p. 36). It would appear that between 1966 and 1973 Ackoff experienced the very shift in perspective that he argued was necessary.

The scientific method that Ackoff objected to was the reductionism present in historic scientific research. The new science was still based on mathematics and the scientific method of research. The difference was in philosophic perspective – a holistic

approach to a system rather than the reduction of the system to its parts (Ackoff, 1972). Ackoff, once a proponent of mathematical formulations to explain and predict human behavior, was now an advocate for a change in philosophic perspective. Like Wittgenstein and Kuhn, Ackoff rejected logical positivism.

Wittgenstein, with his later theories on linguistic analysis, initiated the movement that opposed American Pragmatism and logical positivism in Europe. By the time the Vienna Circle formed to study Wittgenstein's early work and form the basis of logical positivism, Wittgenstein had renounced his allegiance to the precepts of positivism and took up a nomadic life. A few of his manuscripts were released, including *The Blue and Brown Books*, and reached Oxford in the 1940s, precipitating the formation of a school of linguistic analysis. His most influential work, *The Philosophical Investigations*, was published posthumously (Scruton, 1995).

Wittgenstein's later works were decidedly anthropocentric, concerned not with abstractions of ideal logic, but with the fallible efforts of human communication. Wittgenstein gave a new, revolutionary philosophy of mind. Building on the Kantian philosophy about the 'forms of life,' he described meaning as a product of public utterance. He described language as a human artifact, controlled by social norms, and integrated at the individual level. This type of reflection led Wittgenstein to a highly sophisticated level of nominalism – the ultimate fact is that language and the forms of life that grow from it, make language possible.

Much of Wittgenstein's later philosophy is devoted to demolishing what science had attempted to do – to create a description of all that represents our humanity. He believed there was a mystery in all human beings that will not yield to scientific

investigation. Describing human experience did not dispel the mystery, for it rested not in experience but in the forms of life which make the experience possible (Scruton, 1995).

Wittgenstein's formulations gave rise to a philosophical school of thought termed 'cognitive relativism.' Cognitive relativism makes several claims: 1) different cultures or communities have different views and beliefs; 2) different communities operate with different epistemic norms; and 3) no one set of epistemic norms is metaphysically privileged over another. It is the third claim that creates the controversy. Non-relativists, especially those with a positivist view, claim that the epistemic norms of science are excluded from this relativism since science can serve as an objective, universally valid criteria for truth and rationality (Westacot, 2001).

Thomas Kuhn (1922-1996) in his treatise titled *The Structure of Scientific Revolutions* (first published in 1962) subscribed to the concepts of cognitive relativism. The point he made, using historicity as a means to do so, was that great advances in science happened in revolutionary cycles because those credited with the revolution possessed a different paradigm than the scientific community in ascendance at the time.

Kuhn, a physicist turned historian and philosopher of science, popularized the word paradigm, using it to describe the collection of beliefs shared by scientists, the set of agreements about how problems are to be defined and understood. He credits the development of his theory to his readings of a disparate group of scientists and philosophers, especially the writing of Alexandre Koyre, who credits the radical change in thought in 16th and 17th century Europe to the radical changes in our conception of the universe.

While Kuhn was entering Harvard in the fall of 1940, Koyre was teaching his first class in America at the University of Chicago. Koyre was astounded at the naivete and ready acceptance Americans had of things unknown to them. Without a sense of history, students accepted historical statements and people as current rather than historical. Americans were devoid of the cynicism present in Europe, and appeared to possess a blind faith in science. This fueled Koyre's drive to assess science from a historiographic perspective. Kuhn also expressed this perspective when he stated that "science should be learned from the textbooks and journals of the period" (Kuhn, 1977, p.110). In doing so, he discovered that often times famous scientists actually had results that they did not intend and were later attributed to the scientist as the result for which he or she was seeking (Kuhn, 1962; Kuhn, 1970; Kuhn, 1977; Hoyingen-Huene, 1993).

Kuhn claimed that an understanding of science, based on history books, was skewed; current concepts, language usage, and paradigms were used to interpret the past advances in science. Individuals were credited with great discovery versus describing an evolution of thought that led to the discovery. As modern day historians attempted to research history anew, they discovered that it was not as easy to ascribe discovery to a single individual as previous history books had done. The result, and a needed one according to Kuhn, is a historiographic revolution in the study of science. Once viewed historically, science is not compared to the present – it is discussed as it evolved within the historical period (Kuhn, 1977).

The community of positivist scientists converged in debate with Kuhn. If his premise was accepted, then the principles of verification (from logical positivism) and falsification (Karl Popper) were open to debate as to their value in discovering truth in

nature. Truth would be relative to the questions asked in any particular context, culture, or setting. Kuhn accepted Koyre's summation that "in history, the influence of philosophy upon science has been as important as the influence...of science upon philosophy" (Koyre, 1955, p.107). Kuhn demonstrated that the old historiography of science was aimed at teaching contemporary scientific methods, and history was simply a means to illustrate the method. The new historiography of science that emerged between 1955 and 1970 was based on historicity; scientific discoveries were studied within historical context rather than as a direct path to the current state of scientific knowledge. Kuhn argued that there were multiple paths that could have been taken in science that would have provided a different current reality than the one in which we now live; that the questions asked by every scientist are based on his or her background, experience, and philosophy (Kuhn, 1970).

By the early 1970s the U.S. scientific community was in a quandary. The government had set the research agenda for years by means of funding and resource allocation. The failure of the scientific method to help the US win in Vietnam shook the scientific community. In 1973 Russell Ackoff declared that "we are leaving one cultural and technological age and entering another; ...we are in the early stages of a change in our conception of the world, a change in our way of thinking about it, and a change in the technology with which we try to make it serve our purposes" (Ackoff, 1973, p. 661). Ackoff, in full support of the historicity proposed by Kuhn claimed that "scientists and philosophers wanted to invest the history of science with more logic than history itself provided" (p. 667). Yet Ackoff fell prey to a governing philosophy that dictated that an empirical method, based on mathematics, was still the only acceptable methodology.

Wittgenstein's philosophy made an impact on Paul Feyerabend (1924-1994), a young graduate student in Vienna. Feyerabend was born in Vienna and served in the German army during WWII. In 1947 he returned to Vienna to study history and sociology and soon transferred to the study of physics. Like many scientists in his time, Feyerabend could be described as a raging positivist. While at the University in Vienna he met Karl Popper and Ludwig Wittgenstein. Upon receipt of his doctorate he applied to Wittgenstein at Cambridge, but Wittgenstein died before he arrived in England, so he chose Popper as his study supervisor instead. Over the next six years Feyerabend studied and wrote articles on the works of Wittgenstein and translated Popper's *The Open Society and its Enemies* into German. He also published articles on quantum physics. During this period he appears to have rejected positivism for empiricism based on Popper's system of falsification.

In 1958 Feyerabend relocated to the University of California, Berkeley. Between 1958 and 1967 Feyerabend remained committed to his empiricist views. However, in 1969, in a small article titled *Science Without Experience* Feyerabend demonstrated his first break with his empiricist views. Then, in 1970 Feyerabend published *Conversations for the Specialist*, in which he attacked Popper from a Kuhnian point of view. There were, however, significant differences in Kuhn's and Feyerabend's philosophies of science. Kuhn approached advancement in science from the perspective of 'schools of thought' and 'paradigms' that frame the scientific pursuit. Feyerabend was an advocate of outright epistemological anarchy where scientists actively seek to defy all accepted knowledge in the pursuit of new discovery, working from induction to deduction in the process (Preston, 2002; Viney & King, 1998).

In his 1970 article 'Against Method: Outline of an Anarchistic Theory of Knowledge' Feyerabend coined the phrase "epistemological anarchism". He claimed to have applied the liberalism of John Stuart Mill's *On Liberty* to scientific methodology. He presented a strong argument against Popper's falsification, stating that

The idea of a method that contains firm, unchanging, and absolutely binding principles for conducting the business of science gets into considerable difficulty when confronted with the results of historical research. We find, then, that there is not a single rule, however plausible, and however firmly grounded in epistemology, that is not violated as one time or other. It becomes evident that such violations are not accidental events, they are not the results of insufficient knowledge or of inattention which might have been avoided. On the contrary, we see that they are necessary for progress. Indeed, one of the most striking features of recent discussions in the history and philosophy of science is the realization that developments such as the Copernican Revolutions, or the rise of atomism in antiquity and recently (kinetic theory; dispersion theory; stereochemistry; quantum theory), or the gradual emergence of the wave theory of light occurred either because some thinkers decided not to be bound by certain 'obvious' methodological rules or because they *unwittingly broke* them (Feyerabend 2004/1970, p. 373).

He claimed that there is no such thing as a single scientific method. The belief that there is such a method "arises from too naïve a view of man and of his social surroundings. To those who look at the rich material provided by history...there is only one principle that can be defended...It is the principle: anything goes" (p.376). He concluded the article with the comment that "The idea that science can and should be run according to some fixed rules, and that its rationality consists in agreement with such rules, is both unrealistic and vicious" (p. 387). Unrealistic because it is an oversimplification of the talents applied to scientific discovery; and vicious because it attempts to enforce a rule that erects barriers to scientific discovery and possibility, reducing our humanity while increasing our professional qualifications. He recommended that

We can free ourselves from the idea and from the power that it may possess over us (i) by a detailed study of the work of revolutionaries such as Galileo, Luther, Marx, or Lenin; (ii) by some acquaintance with the Hegelian philosophy and with the alternative provided by Kierkegaard; (iii) by remembering that the existing separation between the sciences and the arts is artificial, that it is a side effect of an idea of professionalism one should eliminate, that a poem or a play can be intelligent as well as informative (Aristophanes, Hochhuth, Brecht), and a scientific theory pleasant to behold (Galileo, Dirac), and that we can change science and make it agree with our wishes. We can turn science from a stern and demanding mistress into an attractive and yielding courtesan who tries to anticipate every wish of her lover. Of course, it is up to us to choose either a dragon or a pussycat as our companion. So far mankind seems to have preferred the latter alternative: 'The more solid, well defined, and splendid the edifice erected by the understanding, the more restless the urge of life...to escape from it into freedom.' We must take care that we do not lose our ability to make such a choice (p. 388).

In 1974 Paul Feyerabend gave a talk to the Philosophy Society at Sussex University. The talk was titled *How to Defend Society Against Science* (1998/1974), in which he commented that science had become a religion.

For example, consider the role science now plays in education. Scientific "facts" are taught at a very early age and in the very same manner in which religious "facts" were taught only a century ago. There is no attempt to waken the critical abilities of the pupil so that he may be able to see things in perspective. At the universities the situation is even worse, for indoctrination is here carried out in a much more systematic manner...Society...is criticized most severely and often most unfairly...But science is excepted from the criticism. In society at large the judgement of the scientist is received with the same reverence as the judgement of bishops and cardinals was accepted not too long ago...Pursue this investigation further and you will see that science has now become as oppressive as the ideologies it had once to fight.(p. 56).

Feyerabend took exception with the dominant scientific position that science and the scientific method led to discovery of 'Truth'. He argued that any system that rested its ideology on truth-finding was suspect of twisting that which it was in search of, and that the Truth it found was in its own ideology, not the nature of life.

By 2003 Feyerabend's predictions are born out in the words of science writer

John Brockman:

Through the process of creativity and criticism and debates, [scientists] decide which ideas get weeded out and which become part of the consensus that leads to the next level of discovery. Unlike the humanities academicians, who talk about each other, scientists talk about the universe. Moreover, there's not much difference between the style of thinking of a cosmologist trying to understand the physical world by studying the origins of atoms, stars, and galaxies and an evolutionary biologist trying to understand the emergence of complex systems from simple beginnings or trying to see patterns in nature. As exercises, these entail the same mixture of observations, theoretical modeling, computer simulation, and so on – as in most other scientific fields the worlds of science are convergent. The frame of reference is shared across their disciplines...

There are encouraging signs that the third culture now includes scholars in the humanities who think the way scientists do. Like their colleagues in the sciences they believe there is a real world and their job is to understand it and explain it. They test their ideas in terms of logical coherence, explanatory power, conformity with empirical facts...they do believe that art, literature, history, politics – a whole panoply of humanist concerns – need to take the sciences into account.

Connections do exist: Our arts, our philosophies, our literature are the product of human minds interacting with one another, and the human mind is a product of the human brain, which is organized in part by the human genome and evolved by the physical processes of evolution. Like scientists, the science-based humanities scholars are intellectually eclectic, seeking ideas from a variety of sources and adopting the ones that prove their worth...They think like scientists, know science, and easily communicate with scientists...Science-based thinking among enlightened humanities scholars is now part of public culture (pp. 6-8).

Brockman, in defiance of Feyerabend's warning, views science and the scientific method as the tool by which we discover 'Truth'. By the end of the twentieth century science was the new religion, the means to discover the truth and purpose of man's existence.

The Social Sciences

Social science research has a long history; it has historically been referred to as a 'soft' science, not in a pejorative sense, but more as a means to recognize the imprecision and lack of dependability in the research results within the social sciences. A science is

typically classified as a ‘hard’ science once a degree of quantification can be delivered within the particular field (as is the case now with biology, once referred to a soft science) (Guba & Lincoln, 1994).

John Stuart Mill is said to have been the first to urge social scientists to adopt a positivist, quantitative approach. He claimed that to do so would lead to maturation of the field, and liberty from the philosophical and theological ideologies that limited the social sciences. Social scientists took this to heart, as is exhibited by the popularity of operations research in the twentieth century. In recent years, however, strong opposition has emerged to a purely positivist (verification) or post-positivist (falsification) approach; social scientists adopted and championed the use of qualitative research (Guba & Lincoln, 1994).

Qualitative research philosophy differs from quantitative with its emphasis on processes versus outcomes. These processes are assumed to be value-laden. The goal is interpretation rather than explanation and as a result “[t]he word *qualitative* implies an emphasis on processes and meanings that are not rigorously examined, or measured (if measured at all), in terms of quantity, amount, intensity, or frequency...[and stresses] the socially constructed nature of reality” (Denzin & Lincoln, 1994, p. 4). In contrast, quantitative research emphasizes the measurement and analysis of causal relationships between variables and is considered to occur within a value-free framework.

The surge of qualitative research, along with the debate as to the merits of its methodology, is indicative of the struggle identified by Thomas Kuhn. The debate about the validity of qualitative research is based on different paradigms, or philosophical systems. One believes that ultimate truth can and will be revealed via the scientific

method (positivism and post-positivism); the other that truth is a human construct and is embedded in meaning found in the textual aspects of human existence (Taylor, 1971/1998; Denzin & Lincoln, 1994, Guba & Lincoln, 1994).

Cognitive Science

“Cognitive science is the study of intelligence and intelligent systems, with particular reference to intelligent behavior as computation” (Simon & Kaplan, 1989, p. 1). The foundations of cognitive science include research in the areas of experimental, social, and cognitive psychology, artificial intelligence (within computer science), linguistics, philosophy, neuroscience, anthropology, and economics.

There are some cognitive scientists who claim that the field is based on an Aristotelian view – that cognition is an integral part of emotion. The reigning view of science for over 200 years was based on a Platonic view – that feelings are the enemy of reason and that true citizens should do all they can to banish emotion from day-to-day rational. The recent ascension of an Aristotelian view of science started with the philosophy of science promoted by Kuhn. Since his original essay on *The Structure of Scientific Revolutions* release in 1962 the debate has raged, but he did provide a new philosophy of science that permitted the very paradigm shift of which he wrote decisions (Dalglish & Power, 1998).

In the mid 1950s a group of scientists broke off from the positivist based views of psychology and sociology. George Miller (1956), a professor of psychology, summarized several studies indicating that the capacity of human thinking is limited; short-term memory, for example, is limited to around seven items. In order to remember more

information it is necessary for the human brain to deal with information in “chunks”. For example

A man just beginning to learn radio-telegraphic code hears each *dit* and *dah* as a separate chunk. Soon he is able to organize these sounds into letters and then he can deal with the letters as chunks. Then the letters organize themselves as words, which are still larger chunks, and he begins to hear whole phrases. I do not mean that each step is a discrete process, or that plateaus must appear in his learning curve, for surely the levels of organization are achieved at different rates and overlap each other during the learning process. I am simply pointing to the obvious fact that the dits and dahs are organized by learning into patterns and that as these larger chunks emerge the amount of message that the operator can remember increases correspondingly. In the terms I am proposing to use, the operator learns to increase the bits per chunk (Miller, 1956).

Miller’s premise proposed a new means by which human beings process information that held implications in other fields of inquiry. On reflection on the history of the field of cognitive science Miller (2003) observed that the field is the product of the 1950s, “when psychology, anthropology, and linguistics were redefining themselves and computer science and neuroscience as disciplines were coming into existence. Psychology could not participate in the cognitive revolution until it had freed itself from behaviorism, thus restoring cognition to scientific respectability” (p. 141). He noted that scientists began to realize that the solution to some of their problems depended on the solution of problems that were delegated to other disciplines. Scientists began to seek collaboration.

Noam Chomsky (1928-), a Harvard graduate like George Miller, is a professor of linguistics and philosophy; like Miller he contributed to the decline of behaviorism. His work in generative linguistics helped to advance cognitive science. Chomsky and other linguists demonstrated that people form sentences based on a very formal system of rules. However, regardless of the formality of the system, people often cannot explain the

system by which they create language. Work was beginning, however, on the exploration of language construction within the newly formed field of computer science.

George Miller credits the date that cognitive science was born to September 11, 1956. Miller's date refers to the Symposium on Information Theory sponsored by the Massachusetts Institute of Technology held between September 10-12. At the symposium Allen Newell and Herbert Simon delivered a presentation of their experiments on computer logic; Noam Chomsky delivered a session on his theory of transformational grammar; and Miller delivered his research finding on the capacity limits of short-term memory to approximately seven meaningful units (Miller, 2003; Viney & King, 1998).

Chomsky's review in 1959 of B.F. Skinner's book *Verbal Behavior* (1957) marked the beginning of the decline of psychological behaviorism. In the book Skinner attempted to give a 'functional analysis' of verbal behavior by identifying variables that control verbal behavior and specifications on how the variables interact to determine a particular verbal response. Applying studies in animal behavior, Skinner labeled these variables in terms of such notions as stimulus, reinforcement, and deprivation. Chomsky objected to Skinner's broad categorization of language in behavioristic terms, arguing that "the insights that have been achieved in the laboratories of the reinforcement theorist, though quite genuine, can be applied to complex human behavior only in the most gross and superficial way" (Chomsky, 1959, p. 28). Using examples of laboratory experiments with animals, Chomsky argued that novelty, variety, and enjoyment of complexity caused animals to 'learn' without any other rewards to reinforce behavior. Reinforcement theorists, such as Skinner, were forced to adopt such mystical forces as curiosity, exploration, and manipulation drives to explain such behavior. He found Skinner's

argument, that reinforcement is necessary for learning, to be preposterous stating that “it is difficult to see how anyone can be willing to claim that reinforcement is necessary for learning...[or] taken seriously as something identifiable independently of the resulting change in behavior” (p. 42). Chomsky recognized that

Anyone who seriously approaches the study of linguistic behavior, whether linguist, psychologist, or philosopher, must quickly become aware of the enormous difficulty of stating a problem which will define the area of his investigations, and which will not be either completely trivial or hopelessly beyond the range of present day understanding and technique (p. 55).

Chomsky had effectively put forth a new scientific challenge and re-introduced the concept of *mind* to the natural sciences. Chomsky is also noted for commenting that “defining psychology as the science of behavior [is] like defining physics as the science of meter reading” (Miller, 2003, p. 142).

Then in 1960, Miller, social psychologist Jerome Bruner, and a collection of others obtained a grant from the Carnegie Corporation and founded the Center for Cognitive Studies at Harvard University. While behaviorism still flourished in the US, this group of scientists

re-opened communication with some distinguished psychologists abroad. In Cambridge, UK, Sir Frederic Bartlett’s work on memory and thinking had remained unaffected by behaviorism. In Geneva, Jean Piaget’s insights into the minds of children had inspired a small army of followers. And in Moscow, A.R. Luria was one of the first to see the brain and mind as a whole (Miller, 2003, p. 142).

By 1985 Haugeland was able to claim that “The current generation has seen a sudden and brilliant flowering in the philosophy/science of the mind; by now not only psychology but also a host of related disciplines are in the throes of a great intellectual revolution” (p.2). According to Haugeland, this intellectual

revolution was the result of the developments in the new field of cognitive science, and its subset area of research on artificial intelligence.

While some scientists, including social scientists, continue down the path of positivism, psychologists, in their attempt to be scientific, found that behavioral theories based on physical processes could not adequately explain either animal or human behavior (Lazarus, 1999; Lyons, 1999). “In effect, academic psychology in the USA after the 1960s and 1970s was beginning to abandon radical behaviorism and logical positivism” (Lazarus, 1999, p.13). But old paradigms die-hard – there is yet disagreement within the field of cognitive science as to whether cognition can be analyzed from a reductive causal point of view or from the perspective of a complex, integrated system. Both paradigms, however, have adopted a new perspective based on the concept of the *mind*, which has metaphysical implications: but it is metaphysics based on materialism rather than spiritualism.

Some cognitive scientists still ignore the impact of emotion. Their concern is the computational processes in the human brain. As late as 1989 Newell, Rosenbloom, and Laird wrote that there was no satisfactory integration of emotion, feeling, and affect into the science of cognition. Although psychologists had dealt with emotion for years, the positivists within the loose amalgam of disciplines comprising cognitive science were reluctant to incorporate human emotions as part of cognition. The theories of Plato and Aristotle still divided the field.

The more revolutionary of the cognitive scientists adopt a holistic approach, holding the view that cognition and emotions are interwoven and interdependent and cannot be separated in a reductionist manner for analysis. Lazarus (1999) points out the

same difficulty that Kuhn recognized with emerging scientific fields, that being “the absence of suitable research paradigms” (p. 16), which creates a sense of dis-unity. Each researcher is “forced to build his field anew from its foundations” (Kuhn, 1970, p. 13). Gordon Bower and John Clapper commented in 1989 that “each intellectual discipline has its own rules for justifying its claims, hypotheses, and theories...Cognitive science is a somewhat uneasy marriage of the differing methodologies and styles of justification” (p. 245).

Regardless of their underlying philosophy, the researchers within the cognitive sciences tend to use quantitative, positivist methods. The experiments conducted within the scientific community are based on the scientific method. The challenge is when theory extends beyond the ability of science to test the hypotheses generated. This is the case with the current theories about emotional intelligence (EI) (Bower & Clapper, 1989; Parrott & Hertel, 1999).

EI has recently emerged as a key area of interest both for scientists and lay-people. “EI refers to the competence to identify and express emotions, understand emotions, assimilate emotions in thought, and regulate both positive and negative emotions in oneself and others” (Matthews, Zeidner, & Roberts, 2002). EI emerged as part of the cognitive sciences and was quickly popularized in Daniel Goleman’s (1995) book *Emotional Intelligence*, which appeared on the *New York Times* best seller list in 1996. Since its publication the topic of EI has been picked up in a number of books, magazines, and e-zines, stirring public interest. Goleman did for cognitive science what Herbert Spencer did for Darwin’s theory of evolution – he brought it into the public domain and stirred the imagination of the non-scientific community. Public interest has

both a positive and negative impact. The movement has pushed the scientific community into exploring the topic and is moving us away from our fixation on IQ based measures. “The negative side of the movement is that it is often crass, profit-driven, and socially and scientifically irresponsible” (Sternberg, 2002).

Consciousness and Philosophy of the Mind

Consciousness, as a part of philosophy and science, and has been studied throughout the history of both fields of endeavor. There was a period of about a hundred years, during the most of the twentieth century, when the scientific consensus was that there was no way to construct a scientific theory of consciousness. American pragmatism effectively suppressed interest in consciousness, assuming that there was nothing useful one could say about it.

Recently, however, there has been a shift in both philosophy science and a re-discovery of consciousness. “Many scientists are now willing to take subjective data seriously, as legitimate data. Inner feelings and awareness are appreciated as real and manifest in the world” (Chalmers, 2000, p. 5). The physicist James Trefil thinks “it’s possible to be a good twenty-first century materialist who thinks that the brain is a physical, chemical system that operates according to known, or at least knowable, laws and still think that there’s something different about human consciousness” (Trefil, 2000, p. 7). Trefil also believes that there is recognition within the scientific community that study of the brain is the frontier of research for the next century.

The theoretical physicist Fred Wolf (2000) promotes the existence of “something beyond all materialism, beyond the physical world, out of which *all* reality, the whole of

existence, projects. This would [also] overwhelm traditional dualism” (p. 8). The crux of the mind-body problem is the relationship between the thoughts in our minds and the brain – does thinking occur in the mind or the brain? At the beginning of the twenty-first century the relationship between brain and mind is a topic of intense scientific debate. How is the human brain different than animals? How does it compare with the artificial brain of computers? Neuroscience (the field of modern brain research) explores the processes of cognitive thought, sensory perception, emotional feelings, and behavioral actions. The question is whether or not neuroscience can explain love and hate, ambition and altruism, music and art?

Some neuroscientists, such as Barry Beyerstein, a professor of neuropsychology, believe that the brain is simply a physical organ with anatomical structure and physiological processes where the output is thought. Philosophers David Chalmers and John Searle argue that there is no conceivable way that materialism is going to be able to explain consciousness. In 1998 Searle wrote that “the neurosciences have now advanced to the point that we can address – and perhaps, in the long run, even solve – the problem of consciousness as a scientific problem like any other” (p. 1935). The challenge is to describe in detail how consciousness actually works in the brain; the solution to which “would be the most important scientific discovery of the present era” (p. 1935).

Biology and the Social Sciences

In 1946 Melvin Rader, a philosophy professor at the University of Washington, posited that the contemporary study of science and philosophy would provide “an emerging synthesis of thought and action, a possible new basis for civilization” (p. 500). Common to an American view, Rader saw the world as a system in the midst of an

evolution of mechanical, organic, and conscious levels; one in which science served as “a better foundation than superstition for a comprehensive interpretation of reality” (p. 501).

Rader’s perspective on science and philosophy represents a shift in philosophic thought to incorporate the discoveries in biologic systems into a philosophic system. Rader rejected both absolute idealism (the theory that all reality is mental) and materialism (reality is merely physical) and proposed a philosophy that recognized the biologic structure of the brain as well as the social systems that a complex human brain creates. Rader advocated a philosophy that rejects the views of Herbert Spencer and Thomas Huxley (both who promoted the concept of social Darwinism), and replaces it with the theories developed in studies of sociology, anthropology, and social biology (Nodoushani, 2000).

In 1971 Charles Taylor (1971/1998) described the sciences of man (social sciences) as hermeneutical – that interpretation in the social sciences is an attempt to “make clear, to make sense of an object of study” (p. 110), meaning man’s social history. Taylor argued that the progress of natural science has reinforced a logical empiricism that did not fit well with the social sciences. He warned against the seduction of the natural sciences – cautioning against the push to move the social sciences into lines of inquiry that fit the logical empiricist paradigm.

Taylor was correct, there was not only a seduction in the empirically based natural sciences – there was an outright disdain for any research not conducted utilizing the approved scientific method. Work in the field of psychology strengthened the argument that the social sciences were out of line. According to behaviorists such as J.B. Watson, psychology should restrict itself to examining the relationship between observed stimuli

and observed responses. Man is an animal and therefore, driven by biological stimuli.

Discussions on consciousness and mental representation were banned from

'respectable' scientific discussion and left to the philosopher of metaphysics.

However, in 1982 Wiegele claimed that there was "an intellectual revolution...brewing in the social sciences" (p. 3). The revolution, he posited, was a new biologically based perspective on social behavior.

Biologically oriented social scientists, while recognizing the importance of both learning and environmental influences, have argued that social behavior is much more complex and that the biological attributes of the human organism and evolutionary processes must be taken into account if we are to understand human behavior more accurately...The natural sciences have long recognized the influences of biological factors on social behavior (p. 3).

Although discussions were common following Darwin's *Origin of Species*, the entomologist Edward O. Wilson was the first to formalize a theory that social behavior could be explained evolutionarily; he called his theory sociobiology. Wilson's theory, which he published in 1975 in a book titled *Sociobiology: The New Synthesis* sparked a series of heated debates. The first use of the term sociobiology actually appeared in 1949 in the book *Principles of Animal Ecology* by Warder Alee and Alfred Emerson and their associates. Research on social insects, such as ants and bees, demonstrated that the Darwinian theory of individual selection, where individuals worked toward their own survival, did not seem to apply to those groups. The worker castes of ant and bee societies do not reproduce, yet they will fight tenaciously to protect the society. In 1964 William Hamilton, a British graduate student, published a paper in the *Journal of Theoretical Biology* describing the concept of 'inclusive fitness', whereby an individual

supports the reproductive success of relatives. In other words, worker bees fight to protect the genetic strain present in the queen mother, who carries their genetic material.

The controversy began when the application of sociobiology was transferred from insects to humans.

For example, the question of human criminal behavior may be analyzed via sociobiology. I should emphasize strongly at this point that such analyses are extremely incomplete at this point. A good example of the kind of controversy that sociobiology causes when it studies humans was a conference on criminal behavior that was canceled forcibly in 1993 at the University of Maryland. Some of the participants in that conference were to present theories and data concerning the genetics of criminal behavior in humans. Why are such data controversial? Quite simply, we live in a society that has a philosophical tradition that says that our behavior is primarily shaped by our external environments. When others suggest that our internal environments, our genes, also have the power to shape our behavior, we recoil away from those people and their ideas. It is most interesting to note that we do not have the same response to sociobiology when it is applied to other animals. We breed chickens and dogs to be more aggressive as a matter of course. One can hardly drive through South Louisiana on a Saturday night without running into a cock fight. But, when sociobiologists suggest that some humans may have been naturally selected in the same way, we refuse to accept those arguments (Kardas, 2001).

According to van den Berghe (1978/1982) the social sciences and biology were due to remerge; the two were born out of the same intellectual movement that initiated the modern phase of biology with Darwin and Mendel and could not but eventually come together.

Indeed, early sociology and anthropology were strongly inspired by biology and by evolutionary theory and asked all the right and important questions about human societies. Unfortunately, the biology of the time was not advanced enough to save the social sciences from giving some of the wrong answers. Unsavory associations of early evolutionary thinking in the social science with social Darwinism, racism, imperialism, and laissez faire capitalism led to a revulsion against biology among social scientists.

From the 1930's through the 1960's, the dominant current in sociology and anthropology was one of dogmatic environmentalism, extreme cultural relativism, antireductionism, and antievolutionism...

Human behavior could be understood, it was widely believed, without any reference to the fact that humans are animals. Among the behavioral sciences, psychology and anthropology both retained an interest in human anatomy and physiology, but at the cost of internal fragmentation within these disciplines...the social have become, in short, a scholastic tradition rather than an evolving scientific discipline.

Some social scientists have given up the pretense of doing science and claim affiliation with the humanities...unless their disciplines return to their biological roots their claims to scientific status are going to become increasingly tenuous (pp. 13-14).

Van den Berghe argued that "if the social sciences are to progress they must demystify human behavior...Given our rapidly growing ability to destroy ourselves and our habit, it is urgent that we improve our level of self-consciousness about our behavior" (p. 27).

Charles Frankel (1979/1982), however, disagreed with van den Berghe, claiming that the social sciences and the humanities cannot be unified with biology. Biology, he argued, cannot explain human emotions or terms of ethics, such as 'love', 'hate', and 'good' or 'bad'. He claimed that the move to unify biology and the social sciences represented the quarrel between the old notion of Divine Design (human spirit) and an almost equally encompassing notion of Human Design. Darwinian theory indicated "no separate Creation for man, there was no moment in the history of the evolutionary process when the laws of development ceased their operation and man, miraculously, was invested with a soul" (p. 49). Darwinian theory also introduced profoundly antiteleological thought. There were no preordained ends to the evolutionary process. In replacing Divine intervention humans

have sought to think their way around [Darwinism] by returning purpose to the universe in the shape of a supremely masterful human reason. At one extreme, that reason can reshape man's environment and make a new animal of him. At the other extreme, that reason can grasp man's genetic

structure, and learn enough to shape his evolution to his heart's desire. This denaturalized humanism is the common thread that runs through the evangelical materialisms and positivisms of the nineteenth century, and as the quarrels over sociobiology reveal, it persists in the twentieth century, and joins many in the hereditarian camp to many in the environmentalist... On both sides, they ignore or underestimate the significance of that great area of human life which is controlled by the custom that is second nature, and which is the product of evolutionary experience... Mankind lives within institutions – markets, legal systems, families, states, etc. – which are the products of history...

As a science, sociobiology is new... It reminds us of what the evangelistic fever about an idea tends to make us forget: that human beings have a certain physiology; that their bodies usually control their minds; that they have certain drives, and go through certain arcs of development, which are biological in origin... Societies shape these drives and affect these patterns of development profoundly... for each form of social orientation or control, there is a human cost... We are not machines to be taken apart or put together again. We are organisms with a long history in our genes, and in our habits and sentiments (Frankel, 1982, pp. 50-51).

Frankel feared that the empirical nature of the natural sciences would detract from the philosophic, psychological, and moral basis of the social sciences. The “languages of molecular biology and biochemistry cannot adequately characterize” (p. 45) the qualities of human experience. He, for one, resisted the push for unification.

Barkow (1980/1982) labeled sociobiology as a paradigm (following the lead of Thomas Kuhn) resembling early Freudian thought – both are “widely applicable frameworks rather than simple theories to be proven or disproven. Both can lead to controversial theories of human nature” (p. 60). The controversies continue to rage into the twenty-first century. Columnist Tom Bethel (2001) commented that

Sociobiology extended Darwinian insights about bodies to behavior, and may be thought of as having revived the old controversy about nature and nurture...

It's a sign of our times that when Wilson tried to show that an elaborated version of Darwinism could as easily explain human behavior and nature as it could the behavior of wasps and ants, the cry of indignation arose not from dismayed Christians but from a handful of

leftist scientists, mostly secular Jews, based in Cambridge, Mass. The battle over sociobiology was sometimes construed as left versus right. But Ullica Segerstråle, the sociologist from the Illinois Institute of Technology whose book *Defenders of the Truth: the Battle for Science in the Sociobiology Debate and Beyond* was recently published by Oxford, writes that “the actual dividing line went, rather, between a particular type of New Left activist on the one hand and traditional liberals and democrats on the other”...

You might think that the left would welcome the inclusion of altruism and cooperation in the Darwinian scheme. But sociobiologists had framed the argument in terms of genes, which seemed too deterministic. How could a New Society be built if our tiny masters, lurking inside every cell, hold us (as Wilson said) “on a leash”? Such a vision could only discourage the advocates of revolutionary change. So there was a counterattack, led by the Sociobiology Study Group of “Science for the People.” Their various statements were signed by up to thirty-five names, often preceded by initials only (to discourage sexist thoughts)...

Fifteen cosigners of a statement in the *New York Review of Books* dismissed Wilson’s book as the latest attempt to reinvigorate theories which in the past “provided an important basis for the enactment of sterilization laws and . . . the eugenics policies which led to the establishment of gas chambers in Nazi Germany.” By the time Wilson deplored “this ugly, irresponsible, and totally false accusation,” he surely had the vast majority of scientists on his side. He was accused of being a “determinist,” but nowhere had he said that human behavior was *determined* by the genes. “In rough terms,” he explained, “I see maybe 10 percent of human behavior as genetic and 90 percent as environmental”...

Nonetheless, in the biology departments and in the academy more generally, Wilson and his supporters resoundingly won the debate... it has had considerable success in academic psychology, where it has advanced under the rubric of evolutionary psychology...

One afternoon, years ago at Harvard, [Wilson] showed me the ant armies penned in his office, patrolling about behind clear glass without paying us any heed. He talked most interestingly about them for an hour or more. Like other visitors before and since, I went away wanting to know more. God is in those details, after all. And when Wilson is studying his ants, discovering their pheromones, writing papers about olfactory communication among animals, he is also doing excellent science. He is being what he calls himself—a naturalist. In his consilient mode, on the other hand, not only will God elude him, but synthesizing the –isms and –ologies of the modern academy is bad science into the bargain. In trying to explain everything, one might say that he is not really doing science at all. Wilson’s career reminds us that not only do science and religion not conflict, but that they actually work together rather well (Bethel, 2001).

The nature versus nurture debate was further conflagrated in a 1995 article by Judith Rich Harris. Her article in the *Psychological Review* on the socialization of children was contrary to the theories that had been in place since the 1950s. Previously psychologists studying the socialization of children held to the behaviorist assumption that parents trained their children through the use of reward and punishment. Psychologists and public opinion also held to the Freudian assumption that people's psychological problems were created by their parents. Abusive parents produce abusive children, neurotic parents produce neurotic children, bookish parents produce bookish children, and so on. Harris claimed that all the years of research demonstrating the correlation proved nothing; the research proved correlation, not cause and effect. Of course children resemble their parents – they share the same genes. Once the studies on identical twins raised in separate homes started coming out, proving a dramatically high hereditary influence on personality, Harris claimed we could no longer ignore the possibility that parents put their children's character in place at the moment of conception, not during the formative years of childhood.

Harris provided evidence from other studies that many of the traits we have attributed to environmental influence have a significant genetic component. Genetics have been found to influence behaviors, such as the hours of television watching. Genetics also play a role in attitudes on everything from belief in the death penalty to a liking of jazz music. "Whenever behaviors are 'handed down' from one generation to another, the possibility of genetic influences must be considered. For example, the heritability of traits such as aggressiveness...and impulsivity...might be responsible for the vertical transmission of child abuse" (Harris, 1995).

According to Harris, aside from genetics the strongest affect on socialization and personality development in children is group socialization outside the home, and children self-select into groups according to their personality. Socialization is not something parents do; it is something children do to themselves. Harris's socialization theory supported the premise that the most important job of a parent is not the shaping of a child's character, but to provide support and opportunities. Whereas terrible parenting can still warp a child's personality, adequate parenting, and even good parenting, produces no discernible long-term effect (Harris, 1995; Ridley 2003).

ACT FOUR

Scene 10

TONI: So much changed so fast. We yo-yo'd back and forth over parenting styles every generation! No wonder we're all so messed up! Any more I don't know who is more childish, my high school kids or their parents. Now I know why – schizophrenic perspectives on raising kids.

GEORGE: I know what you mean, Toni, I see the same thing in business and so does Ellen. I decided years ago just be consistent.

ELLEN: You can enjoy that luxury, George – you own the place and only have a couple of managers. Our company goes through a major overhaul every time we get a new manager.

ADAM: You see the same kind of changes in management?

MINERVA: The workplace is just a microcosm of the larger culture. As goes the

culture, so goes the organization. The difference is that you often see exaggerations of cultural factors. A few people run the company and the rest self-select into it. That is why there is often time a large turnover in staff under new management. In a good economy people have choices.

BILL: Yes, but people used to work the same job for their entire career. You don't see that much anymore. Seems like there's less loyalty on either side.

MINERVA: True, but you would have to understand where we were and where we've come. The workforce is also very different, especially in western countries, than it was even after WWII. There are now fewer hands-on jobs and more that require highly skilled workers. The intellectual landscape of our country has changed, as well as the cultural...

Management Theory 1940-2005

Following WWI the U.S. economy began to soar. Between 1921 and 1929 the gross national product increased 47 percent. Per capita income rose by more than a third and federal taxes reduced. Cities prospered and Wall Street enjoyed a period of bull market. But while the cities were prospering, the rural areas of the country were sliding into economic trouble. The boom in agricultural exports enjoyed during WWI dried up and exports returned to pre-war levels. Still, production continued to climb. The use of the tractor spread, allowing farmers to cultivate more land. Unfortunately, the tractor brought with it economic trouble. Not only were farmers more productive, but it freed up land once used to grow feed for draft animals. In 1900 a third of crops were cultivated to produce feed for work animals. As the horses and mules disappeared from the farm, the

land was increasingly used to produce human foodstuffs – farm prices began to steadily decline.

The decline in farm value hurt the rural banks. In 1921 there were over 29,788 U.S. banks, the majority of which were small operations in country towns. State laws prohibited banks to combine into larger, more financially stable institutions. As farm prices dropped, farmers defaulted on their loans. During the 1920s these small town banks began to fail at a rate of about 550 banks per year. President Herbert Hoover, in a faulty attempt to help farmers, proposed a bill to raise tariffs on agricultural imports. By the time the bill passed through Congress it was laden with special-interest addenda. The resulting bill, called the Smoot-Hawley tariff produced the highest tariff in US history. Economists, predicting disaster, appealed to Hoover not to sign the bill. Ignoring their petition Hoover approved the bill. Other countries reacted immediately; tariffs rose around the globe causing a near collapse in world trade. In 1929 the US exported 5.2 billion dollars worth of goods – in 1932 only 1.6 billion dollars worth was exported. Levels of trade remained lower in 1939 than in 1914. Instead of protecting U.S. jobs the Smoot-Hawley bill was destroying them by the droves.

Coupled with Hoover's tax increase in 1932, the U.S. economy further contracted. The gross national product, which had reached \$87.2 billion in 1929, fell to \$42.8 billion by 1932. Unemployment soared from 3.2 percent in 1929 to 24.8 percent in 1933. The stock market plunged nearly 90 percent between 1929 and 1932. In 1930 more than 1,300 banks closed; in 1931 another 2,000 shut their doors. By 1932 another 5,700 banks failed. By March 1933 a nationwide panic was underway. The newly elected President Franklin D. Roosevelt closed all banks until they could be examined, assuring investors that banks

that re-opened were sound. His approach worked and averted a national financial catastrophe.

In an effort to turn the tide of economic disaster Roosevelt turned government deficit into a matter of deliberate policy. Between 1933 and 1940 government spending doubled from \$4.6 billion to \$9.6 billion, increasing the national debt with it. Along with spending, Roosevelt increased government regulation. The banking system was overhauled. Wall Street brokerage firms came under regulation for the first time. Roosevelt appointed Joseph P. Kennedy as the first chairman of the Securities and Exchange Commission. Roosevelt favored organized labor and in 1935 passed the National Labor Relations Act, guaranteeing labor the right to organize and bargain collectively.

In the meantime, Hitler was making his moves in Europe. By early 1940 Hitler was engaged in a full scale invasion of Europe. All that stood between Hitler and German domination of all of western Europe were the British. Then, on August 24th, 1940, the first German bombs were dropped on London. Roosevelt, convinced that Hitler posed a threat to American security, argued against the Congressional attitude of non-involvement in the European war. Throughout his campaign for presidency in 1940, Roosevelt worked to rally national opinion. After the battle of Dunkirk, Roosevelt convinced Congress to sell supplies to Britain on a cash and carry basis. However, in 1940 Britain ordered 12,000 airplanes and was unable to pay for them. On Roosevelt's urging Congress approved a policy of lend-lease.

On December 29, 1940 Roosevelt gave his 'Arsenal of Democracy' speech, in which he described aid to Britain and China as the best way for America to stay out of the

war. U.S. industry turned to the production of war machinery. With the attack on Pearl Harbor and US involvement in the war American industry increased its production of military supplies. In the four and a half years after Roosevelt's speech American industry produced over 296,400 airplanes; 86,300 tanks; 64,546 landing craft; 3.5 million jeeps, trucks, and personnel carriers; 53 million tons of cargo vessels; 12 million rifles, carbines, and machine guns, and 47 million tons of shells.

In a 1944 memo to Adolph Hitler, Alber Speer, Germany's armament minister, credited US superiority to its system of organization. He wrote that the war was "a contest between two systems of organization...[and that Americans] knew how to act with organizationally simple methods, and therefore achieved greater results, whereas we were hampered by superannuated forms of organization and therefore could not match the other's feats" (as cited in Beatty, 2001, p. 206). The U.S. organizational advantage was scientific management, which was the U.S. corporations' key contribution to the war effort.

The U.S. economy was temporarily converted from free market to centrally planned. Donald Nelson, a former Sears, Roebuck executive, was appointed head of the War Production Board. Nelson controlled all necessary resources and allocated them as needed to meet wartime demands. Under Nelson's direction new industries emerged. With the end of the war the US once again turned to peacetime industry. The U.S. dollar was established as a unit of global exchange. Pent-up demand emerged to fill the potential void left by the lack of demand of war machinery. Because employment increased during the war, so did income, most of which had gone into family savings. Savings rates between 1940 and 1945 were higher than at any other time in US history.

Now, with industry switching back to civilian production the demand for goods kept factories busy (Faragher, Buhle, Czitrom, & Armitage, 2000; Farah & Karls, 1997; Gordon, 2001).

During World War II scientific management was applied in a new way. Systems analysis emerged under the title of Operations Research. Operations Research used systems concepts and mathematical quantitative approaches, including statistics, engineering, and other related fields to solve problems. Born out of the application of scientific management to the fighting of a war the 'science' of operations research developed into a research paradigm by the mid-1950s. According to Russell Ackoff (1956), a leading proponent of operations research (OR) in the 1950s-1980s,

the early work in the USA (1941-1946) under the name of operations research was accomplished primarily by mathematicians and physical scientists... since 1950, an increasing number of statisticians, engineers (particularly industrial engineers), economists, behavioral scientists, logicians, and computers (human and mechanical) have moved into operations research, and this new blood has contributed greatly to its development. The invasion by these disciplines was not greeted with uniform enthusiasm by the 'old timers,' but most of them have learned to relax and even enjoy the precociousness of the newer sciences, pure, applied, and pseudo... many of the developments to which reference [is] made originated not under the name of operations research, but in other sciences and branches of engineering. But these developments are the precursors, in their specialized fields, of the unified science which, for want of a clearly preferable name, is here called 'operations research' (p. 266).

Ackoff claimed that by the mid-1950s most operations researchers would agree on the major phases of an OR project as

1. *Formulating the problem.* This refers to both the consumer's problem and the researcher's problem.
2. *Constructing a mathematical model to represent the system under study.* This model expresses the effectiveness of the system as a function of a set of variables at least one of which is subject to control.

Variables of either type may be subject to random fluctuation, and one or more may be under the control of a competitor or other 'enemy'.

3. *Deriving a solution from the model.* This involves finding the values of the 'control variables' that maximize the system's effectiveness.
4. *Testing the model and the solution derived from it.* This involves evaluating the variables, checking the model's predictions against reality, and comparing actual and forecasted results.
5. *Establishing controls over the solution.* This involves developing tools for determining when significant changes occur in the variables and functions on which the solution depends, and determining how to modify the solution in light of such changes.
6. *Putting the solution to work.* Implementation...

There is usually a continuous interplay between these steps during the research, that is, there is usually considerable recycling of the results of each step through the preceding steps (Ackoff, 1956, p. 265-266).

Operations research incorporated all the cutting edge 'sciences' of the time, including the new field of behavioral science (Ackoff, 1956).

In 1947 Herbert Simon (1916-2001) published his book *Administrative Behavior*, in which he constructed an administrative theory using Barnard's decision-making approach. Since communication of information is required to make good decisions, he sought a way to analyze the human mental processes through the use of electronic computers to simulate rational processes. In his investigations he determined that humans operate in a system of bounded rationality in making managerial decisions. Bounded rationality recognized human limits to a person's knowledge of all the alternatives available and the attendant consequences. The human mind can only focus on a few things at a time, making use of only a small portion of the information present in the environment. Simon described a decision-making process in which people seek a satisfactory outcome, not necessarily the optimum or best. Incorporating the concepts of behaviorism, Simon presented a description of the administrative human being based on three basic principles. First, humans make decisions based on the most convenient, least

costly information. Secondly, that the process is repeated depending on the aspirations and outcomes of the decision. And third, the process is based on an ordering of preferences that are influenced by perceptions, training, experience, goals, beliefs, and values. Organizational objectives, policies, and constraints of the external environment (culture, government, customers, etc) limit these preferences. For example, when a manager must make a decision between increasing the salary of subordinates or risk losing them to competitors, the manager's decision must take into consideration such factors as finances, productivity of subordinates, company pay policies, legal regulations, and many other considerations that limit discretion. In consideration of all these factors the manager strives to reach a good decision, although his or her bounded rationality may not even take into consideration the optimal solution.

Simon postulated a theory of the organization as a structure of decision-makers. At the top of the organization managers are engaged in three types of decision-making activities: intelligence (determining what conditions require decisions), design (developing and analyzing possible courses of action), and choice (choosing a course of action). Managers also develop communication networks that provide information for subordinates' decisions. Simon proposed a framework, terminology, and method that introduced the so-called behavioral school and the quantitative school of management thinking.

The term 'behavioral sciences' came into vogue in the US during the early 1950s as a result of government sponsorship. The depression and the war created a climate in which Americans readily accepted government control of the economy and scientific research. During the war the U.S. government invested heavily into scientific discovery,

which carried on after the war. Large national budgets drove research agendas. Following the war the government retained control of research funding, pushing science in support of government agendas. In fact,

[T]he concept of behavioral science was an invention of the US government, packaged for both domestic use and to be exported to the rest of the world, much as the 'Forum Series' of 'the Voice of America' attempted during the 1950s...the concept 'behavioral sciences' represents...an administrative arrangement that became intellectually institutionalized (Nodoushani, 2000, p. 78).

The U.S. government applied the behavioral sciences as a means to direct the philosophy, policies, and actions of both domestic and foreign governments. The views of logical positivism converged with the behavioral science revolution. Scientists, and social scientists in particular, were encouraged to put all claims into testable form. Social science was pushed to reduce all concepts into common sense physicalist terms.

The Cold War began to dominate the human condition and opened up a cultural discourse that influenced scientists and policy makers. The most urgent goal during the Cold War was the prevention of thermonuclear destruction of the world and the end of communism. The large budgets designed for military research produced positive results for economic growth and technological advancement.

The behavioral science revolution sponsored by the U.S. government made its largest impact in the area of management and business education. A report in 1959 by Robert Gordon and James Howell (sponsored by the Ford Foundation) advised that management education replicate the epistemology of the behavioral sciences. The newly emerging business disciplines of management, marketing, etc. eagerly adopted positivist behavioralism. Supported by government dollars positivism and behaviorism were

closely merged as the only acceptable way to do scientific investigation (Nodoushani, 2000).

Another movement emerged in the early 1950s referred to as the human resources school, which advanced the philosophy of management present in the human relations movement that began in the 1930s with the work of Elton Mayo. The applied behavioral approach focused on leadership traits rather than increased productivity. The human resources school is based on the belief that the creativity and competence of employees is largely untapped. The goal of leadership is, therefore, to create meaningful work that allows employees to contribute and participate in decision making and leadership functions.

In 1960 Douglas McGregor introduced his Theory X and Theory Y perspective on leadership. McGregor stated

that the most significant developments of the next quarter-century will take place not in the physical but in the social sciences, that industry – the economic organ of society – has the fundamental know-how to utilize physical science and technology for the material benefit of mankind, and that we must now learn how to utilize the social sciences to make our human organizations truly effective...

To a lesser degree, and in a much more tentative fashion, we are in a position in the social sciences today like that of the physical sciences with respect to atomic energy in the thirties. We know that past conceptions of the nature of man are inadequate and in many ways incorrect. We are becoming quite certain that, under proper conditions, unimagined resources of creative human energy could become available within the organizational setting (McGregor, 1964/2000, p. 267-268).

McGregor described Theory X as the conventional conception of management. Managers are responsible for organizing the elements of the productive enterprise. People are indolent, lack ambition, are self-centered, resistant to change, not very bright and require direction. In the application of Theory X management can be 'hard' or 'soft'. Employee

behavior can be directed employing techniques ranging from coercion and threat to the use of permissive actions that seek harmony. According to McGregor Theory X management was explored during the early part of the twentieth century. Both the hard and soft approaches were found to create difficulties. He claimed that the approach most commonly applied in the middle of the century was the theme of 'firm but fair'.

McGregor claimed that the conventional view (Theory X) is inadequate, and that

The findings which are beginning to emerge from the social sciences challenge this whole set of beliefs about man and human nature and about the task of management. The evidence is far from conclusive, certainly, but it is suggestive. It comes from the laboratory, the clinic, the schoolroom, the home, and even to a limited extent from industry itself...

Perhaps the best way to indicate why the conventional approach of management is inadequate is to consider the subject of motivation. In discussing this subject I will draw heavily on the work of my colleague, Abraham Maslow...Man is a wanting animal – as soon as one of his needs is satisfied, another appears in its place. This process is unending. It continues from birth to death (McGregor, 1964/2000 pp.270-271).

McGregor claimed that the "carrot and stick theory of motivation" (p.274) works reasonably well in some circumstances, but is inadequate once man has reached an adequate subsistence level. Motivation to achieve higher levels of needs (as described by Maslow) creates a new situation for management. The high standard of living created by modern technology created a situation in which the physiological and safety needs of man are met. As a result, it was time for a new theory of management based on "more adequate assumptions about human nature and human motivation" (p. 275). He referred to this new paradigm as "Theory Y". Theory Y is based on four assumptions:

1. Management is responsible for organizing the elements of productive enterprise...
2. People are not by nature passive or resistant to organizational needs. They have become so as a result of experience in organizations.
3. The motivation, the potential for development, the capacity for assuming responsibility, the readiness to direct behavior toward

organizational goals are all present in people. Management does not put them there. It is a responsibility of management to make it possible for people to recognize and develop these human characteristics for themselves.

4. The essential task of management is to arrange organizational conditions and methods of operation so that people can achieve their own goals *best* by directing *their own* efforts toward organizational objectives.

This is a process primarily of creating opportunities, releasing potential, removing obstacles, encouraging growth, providing guidance. It is what Peter Drucker has called 'management by objectives' in contrast to 'management by control' (pp. 275-276).

McGregor claimed that conventional organizational theory and the application of scientific management for the first half of the century created a work climate in which men were bound to work that was devoid of meaning, jobs that discouraged acceptance of responsibility, and that created a conditioned response to the industrial organization. He advocated a shift from Theory X management to Theory Y. He acknowledged that the shift would be slow, but was already underway. He noted some applications of Theory Y in the movements toward decentralization and delegation, job enlargement, participative and consultative management, and use of performance appraisals (McGregor, 1957/2000).

According to McGregor, the assumptions of a leader are important "because what one believes to be true causes one to behave in a certain way. This behavior, in turn, causes others to behave exactly as one expected. This is the way people create *self-fulfilling prophecies*" (Duncan, 1989, p. 188). Treat employees as if they are lazy and irresponsible, requiring the institution of strict rules and oversight, and workers will soon find way of getting around the system, acting irresponsibly just as Theory X predicts. But treat them as responsible, mature adults and a system of incentives will be set up to encourage responsible behavior.

Critics claimed that McGregor's theory was actually a non-theory, based more on hopes than on evidence. Yet his book *The Human Side of Enterprise* (1960) became a classic in management theory because of its focus on the role of the leader and the impact of the leader's assumptions about followers on leader behavior. The importance of managerial assumptions led to a study of the merits of different styles of leadership and management.

Psychologist Rensis Likert (1903-1981) started a program of research on leadership styles in the mid 1930s. His interest in leadership styles continued throughout his lifetime. In 1961 Likert published the foundations of his theory of leadership in *New Patterns of Management*. Likert claimed that the most effective leaders are those who form a linking function with people above and below them in the organization. He also proposed that leaders should ensure that all interactions in an organization be supportive and build and maintain sense of personal worth for all employees.

In 1967 Likert published *The Human Organization* in which he proposed a set of factors used to classify organizational styles. His four types of organizations are (1) System One organizations – *exploitive authoritative* (no trust), (2) System Two organizations – *benevolent authoritative* (master-servant relationship), (3) System Three organizations – *consultative* (followers are consulted but not in control), and (4) System Four organizations – *participative* (high level of trust). It takes time and effort to transition to a System Four organization. Despite research results that demonstrated the merits of System Four, Likert found it difficult to keep up the confidence and enthusiasm of top management long enough to effect the changes required to build a participative system.

The human relations orientation is evident in the ideas of both Likert and McGregor. Both argue that the type of climate management establishes influences employee performance. Both proposed approaches to management that focused on the human factor as means to achieve higher levels of individual and organizational performance. It seems apparent that the two believed the human relations orientation of Theory Y and the System Four organization were preferable to other leadership styles (Duncan, 1989).

While Likert and McGregor were arguing for one best style of leadership, psychologist Fred Fiedler argued that the most effective leadership style is contingent on situational factors. He argued that organizational dollars are better spent in recruitment and placement of particular types of leaders according to situational factors than on spending limited organizational funds on human relations seminars.

Not to be undone by the human relations movement, management scientists continued to argue for the application of quantitative methods to organizational issues. The behavioral theories of management gurus and new theories in the social sciences were absorbed into systems science. In 1972 Russell Ackoff, the guru of operations research, noted that

With World War II we began to shift into the Systems Age. A system is a whole that cannot be taken apart without loss of its essential characteristics, and hence it must be studied as a whole...nonmechanistic ways of viewing the world were developed which were compatible with the older mechanistic view and which made it possible to deal with free will, goal seeking, and purposes within the framework of science. Instead of thinking of men in machine-like terms we began to think of machines in man-like terms.

The Systems Age brought with it the Post Industrial Revolution. This very young revolution is based on machines that can observe (generate data), communicate it, and manipulate it logically. Such machines make it possible to mechanize mental work, to automate.

In the Machine Age science not only took the world apart, but it took itself apart, dividing itself into narrower and narrower disciplines...Shortly before World War II science began to put itself back together again...As a result, a host of new interdisciplines emerged such as Operations Research, Cybernetics, Systems Engineering, Communications Sciences, and Environmental Sciences... Systems Science is the limit of this process, the amalgamation of all the parts of science into an integrated whole...it denies the value of the separation of science and the humanities...It offers us some hope of dealing successfully with such problems as poverty, racial and other types of discrimination, crime, environmental deterioration, and underdevelopment of countries. Systems Science may not only be able to assure man of a future, but it may also enable him to gain control of it (pp. 40-41).

Management theorists and scientists in the latter part of the twentieth century were coming to understand that it is difficult to address issues in complex systems without a unified approach to science and philosophy in applications of management theory. As organizations transitioned from manufacturing environments to information handling environments, old theories of management and production were no longer effective.

By the late 1970s, management theorists were applying the new discoveries in the cognitive sciences to organizational contexts. The lag between discovery and application was becoming shorter. New scientific research findings were being published, read, adopted, and applied in management settings. Management theorists with advanced degrees in a variety of sciences have written and are continuing to write articles and books that challenge managers and introduced new discoveries; for example, Kurt Lewin (philosophy and psychology), Rensis Likert (economics, sociology, and psychology), Douglas McGregor (psychology), Fred Fiedler (industrial, organizational and clinical psychology), Chris Argyris (psychology and organizational behavior), Donald Schon (philosophy), Peter Senge (engineering, social systems, and management), Edgar Schein (social psychology), Peter Drucker (law, economics and philosophy), and Edward Lawler

(sociology and social psychology) among others. The literature driving change in management theory is dominated by the educated elite. The perspective of the management gurus has been taught in advanced management degree programs now for the past fifty years.

Management guru Peter Drucker (1909-) began researching and writing about management issues back in 1929 and as such has a long-term perspective on management paradigms. In his latest book *Managing in the Next Society* (2000) he commented that “For a half a century, from 1950 to the 1990s, enterprises in the free, noncommunist world and their executives could and did take society very much for granted...[but now] executives will have to understand the realities of the Next Society and will have to base their policies and strategies on them” (p. xi). Drucker pointed to changes in world politics and the ramifications on organizational practice, claiming that

Terrorists and America’s response to them have profoundly changed world politics. We clearly face years of world disorder...But in a period of unrest and rapid changes...one cannot successfully manage by being clever. Management of an institution, whether a business, a university, a hospital, has to be grounded in basic and predictable trends that persist regardless of today’s headlines. It has to exploit these trends as opportunities. And these basic trends are the emergence of the Next Society and its new, and unprecedented, characteristics, especially the global shrinking of the young population and the emergence of the new workforce; the steady decline of manufacturing as a producer of wealth and jobs; and the changes in the form, the structure, and the function of the corporation and of its top management. In times of great uncertainty and unpredictable surprises, even basing one’s strategy and one’s policies on these unchanging and basic trends does not automatically mean success. But not to do so guarantees failure (Drucker, 2000, pp. xii-xiii).

Drucker’s comments address the issue at hand – as the structure of society changes so must organizations and management practice. Globally, but most noticeably in western society, we now live an environment where the general public is educated and expects a

higher standard of living. The western economy has evolved from an industrial to a post-industrial system. With this evolution are new jobs that do not lend themselves to old styles of management.

Without an understanding of these trends, managers will find themselves dependent on management consultants who may or may not have an understanding of the basics of human psychology and management science. These managers will find themselves subject to the latest 'management fad' – the types that led to traumatic cycles that have left residual scars inside organizations. For example,

The early 1990s brought the re-engineering craze. It coincided with a recession and thus meant layoffs...Revenue for the consultants who touted re-engineering exploded to an estimated \$2.5 billion by 1995. That led to a business-school bonanza – a 43 percent rise in M.B.A. degrees during the 1990s – that created an entire class of professionals dedicated to management...Recently management became personalized in the form of celebrity CEOs...By the 1990s, CEOs had become new-age messiahs, spreading a flamboyant gospel of motivation and empowerment that could bring success to all aspects of human enterprise. The personification of the breed: former General Electric CEO Jack Welch. But owing to the bear market and a rash of corporate scandals, 'the bold turnaround and the white knight savior have been discredited'... 'It's back-to-basics time for managers'...The back-to-basic trend, if indeed it is one, has certainly been on display in recent months at the world's largest media company. After the hype surrounding the two-year-old merger of Time Warner and AOL faded and the promised synergies never arrived, a diplomatic attorney has pushed aside a charismatic Internet visionary and a colorful media tycoon to head the ailing firm...new chairman Dick Parsons has promised fewer big deals and radical transformations and more careful stewardship of assets...Who knows? If it works at AOL, back to basics may become the next management trend worth a try (Benjamin, 2003, p. 75).

According to Want (1996) "The age of traumatic business reengineering will be replaced by an age of corporations designed to constantly evolve" (p. ix). The challenge in a rapidly changing corporate environment is how to manage a better educated, more independent, and mobile workforce. New technology created through scientific research

is challenging the paradigms we hold. And as Drucker (1999) with a lifetime in management so aptly observed – change has become the accepted norm; we have now entered a time in management history where “One cannot manage change. One can only be ahead of it” (p.73).

Future Challenges in Management

The last years of the twentieth century mark the transition of western civilization from an industrial to a post-industrial society, with all of its associated challenges. Daniel Bell first wrote about this new phase in 1973. His book *The Coming of Post-Industrial Society* was a forecast of the challenges western society would face in the transition from an industrial economy to a post-industrial economy. In the new forward to his 1999 edition Bell described the dramatic difference between an industrial and a post-industrial society.

The novel and central feature of post-industrial society is the codification of theoretical knowledge and the new relation of science to technology. Every society has existed on the basis of knowledge and the role of language in the transmission of knowledge. But only in the twentieth century have we seen the codification of theoretical knowledge and the development of self-conscious research programs in the unfolding of new knowledge. One sees this change in the new relation of science to technology. Almost all the industries of the nineteenth century – steel, electricity, telephone, automobile, aviation, the wireless – were created by talented tinkers...who were indifferent to or worked independently of the developments in science. But the major developments of the twentieth century – in telecommunication, computers, semi-conductors and transistors, materials science, optics, biotechnology – derive from the revolutions in twentieth-century physics and biology. From Einstein’s work in quantum theory and optics...to the discovery of the double-helix structure of DNA...Research and development are the handmaidens of invention and innovation, and these are integral to the developments in science (Bell, 1999, pp. xiv-xv).

The transition from an industrial to a post-industrial society brings with it new challenges in managing organizations.

Organizations face new challenges as the social and cultural composition of the general employee population becomes more diverse. Knowledge is expanding exponentially, increasing the rate of change, and social values are constantly evolving. Even domestic organizations residing in the United States are faced with this challenge. It is expected that racial/ethnic minorities will make up fifty percent of the U.S. population by the year 2050 (US Census Bureau). Additionally, “more and more Americans have become obsessed with ‘doing their own thing’ and with an independence unencumbered by standards and values perceived to be imposed by...the larger society” (Work, p.72).

Bridges (1996) points out that the majority of changes we face in organizations today are usually related to technological developments. Technology forces people to learn new ways of communicating, produces rapid modification in products and services, and results in dissemination of changes globally that were at one time only visible locally. The first two factors produce change, while the dissemination of changes globally is the primary contributing factor to the increasing rate of change. “The adoption of new IT continually (re)defines work related- and social roles, contributing to a significant shift in the international pattern of specialization and competitiveness at a rate that is often faster than related organizational and socio-economic theories can address” (Korac-Kakabadse, Nada, Kouzin, & Alexander, 1999, p. 293). Employees throughout organizations have “at their command powerful technologies that give them access to a depth and range of information that was formerly restricted to those at the top, as well as the means to apply that information directly in their work” (Helgesen, 1996, p. 21).

Employees in a knowledge-based economy must continually learn and be able to put what is learned into immediate use if organizations are to remain competitive

(Bridges, 1996; Drucker, 1995; Want, 1995). A new vocabulary has developed to describe the changing marketplace. "Companies compete in a 'knowledge economy,' skilled functions are performed by 'knowledge workers,' and firms that improve with experience are 'learning organizations'" (Klein, 1998, p.1). It no longer holds true that organizations with the largest physical and financial resources have the competitive advantage. Now, successful products are easily duplicated and marketed; small, innovative companies can quickly grab market share. The ability to respond quickly, to adapt and innovate, is key to competitive advantage. Organizations now compete on the basis of their intellectual capital, their knowledge, experience, and creativity.

Cultural changes and societal perspective on culture have also created a challenge for today's managers. Change in the cultural composition of organizations has occurred worldwide and the trend will continue due to several factors - immigration, the merger and expansion of global organizations, and organizations hiring technically competent workers from a global pool of applicants. The reaction of the world citizenry to this cultural recomposition varies by country. "Millions of ex-colonials, 'guest-workers,' refugees, and other immigrants have settled in western Europe in recent decades...direct and indirect discrimination against the new minorities is pervasive. Moreover, anti-discrimination efforts have been largely ineffective" (Pettigrew, 1998, p. 77) (Girndt, 1997; Hopkins & Hopkins, 2002; Ivancevich & Gilbert, 2000).

By the year 2020, the U.S. workforce will be 47% female, 51% will be between the ages of 35 to 54, and more than 30% will be of an ethnic or racial minority. There are mixed opinions as to the efficacy of U.S. diversity management programs. Opinions about diversity management programs range from the cynical view that organizations

have adopted diversity as a means to escape public scrutiny and public policy, to the optimistic perspective that organizations have adopted an altruistic view toward diversity management. The most commonly espoused rationale for organizations to adopt a diversity management program is the claim that diversity is good business and produces improved financial performance. However, the claim of improved performance is anecdotal; there is relatively little empirical evidence that demonstrates financial gain in managing diversity (Ivancevich & Gilbert, 2000).

Regardless of motivation, the reality is that the trend toward diversity is changing organizations. A basic tenet of organizational behavior is that organizations are a reflection of the people who work in them and vice versa; work organizations influence people and people influence work organizations (Schneider, 1987; Brief, 2002). Based on this philosophy, increasing diversity makes a significant impact on an organization. Across a wide range of research disciplines, there is an on-going debate regarding the degree to which people impact an organization versus the degree to which the organizational climate impacts the behavior of people. The change in demographics within organizations brings this debate to the forefront – do people change behavior based on the organizational climate or do they change the organizational climate?

For years there has been a divided camp of scholars. Within the field of industrial and organizational (I/O) psychology (the behaviorist camp), there is an assumption that situational variables (environment, groups, technology, structure, etc.) are the main determinants of behavior. Kurt Lewin's approach to change was the product of behavioral psychology, influenced predominantly by the traditions of Watson and Skinner. Within the interactionist camp, the premise is that persons cause human

environments. Schneider (1987) claims that Lewin may have overstated his case when he hypothesized that behavior(B) is a function of person (P) and environment (E), that is, $B = f(PE)$. Schneider's hypothesis is that environments are a function of the persons behaving in them, that is, $E = f(PB)$. The debate provides differing views of organizational and individual behavior that enable us to look at situations from multiple perspectives.

Both philosophies have influenced researchers who have explored the area of diversity. A large body of research has focused on the cultural issues that arise in multi-national corporations. A significant number of articles discuss the issues that exist when expatriates are sent in to work with or manage in countries other than their nation of origin. There is also a body of research dedicated to diversity management, typically from a theoretical perspective (Bandura, 2002; Ely & Thomas, 2001; Markoczy, 1997; Markoczy, 2000; Milliken & Martins, 1996; Romano, 1995;).

The research applied to multi-national organizations and to segregation issues in the US needs to expand to address the issues that arise in multi-cultural organizations and nations. There are two different views about cultural integration of diverse populations. One view is the 'melting pot', where people of different races and ethnicities are blended together and assimilated in a common national culture. The second view is based on a 'multicultural society', where different ethnic groups retain their cultural patterns and coexist with each other. "The view of the dominant or Caucasian race has generally been that the melting pot is what is best" (Ivancevich & Gilbert, 2000, p.76). This belief may be the driving force behind the US approach to integration of the African-American community. Most diversity programs within the US have been designed to address

segregation and discrimination against African-Americans and other minority groups. Up until recently the African-American population has been the largest minority group within the US. Rather than address cultural differences between populations, US diversity programs appear to start with the assumption that African-Americans share a common national culture with Caucasian Americans. As a result, diversity programs focus on assimilating African-Americans into Caucasian culture. The primary outcome appears to be to teach that blatant discrimination based on race, ethnicity, gender, or sexual orientation is wrong. Using this approach we now find

Racial slurs and derogatory remarks are heard rarely in the contemporary American workplace... Just 50 years ago, public opinion polls showed widespread acceptance of segregation and discrimination based upon race; today, these polls demonstrate that blatant racist attitudes are no longer popular and racist expressions are socially unacceptable... [However] Blatant racism has been replaced by a more subtle form of racism that reflects an adherence to such traditional American values as individualism rather than open bigotry. Managers, in attempting to fulfill seemingly reasonable business objectives, may create conditions conducive to these new racist attitudes. Only by understanding the nature of the new racism, including how it is activated, can managers avoid the unintentional promotion of segregation and discrimination in their organizations (Brief, Buttram, Reizinstein, Pugh, Callahan, McCline & Vaslon, 1997, p. 59).

We now have a more polite society, but one that has not yet developed an understanding of what it means to be multi-cultural. Despite more polite and less discriminatory behavior, most Americans do not recognize or understand the communication barriers that exist due to cultural differences. Being born in the US does not mean that we have one common culture. Failure to understand this complicates communication, leads to misunderstanding and distrust, and inevitably slows down a change process.

Without an understanding of what it means to be a multi-cultural society, organizations and organizational members perpetuate a new, subtler, yet corrosive, form of racism. Overt racist behavior is not tolerated; however, internal stereotypes and racism continue to exist. Attitudes and behaviors that stem from negative perceptions are still exhibited. As individuals perceive that they are devalued, the end product is negative outcomes that adversely impact organizational performance.

Failure to understand multi-culturalism leads to another interesting development. “Evidence suggests that minority and majority racial group members develop far fewer informal ties with each other than the availability of cross-race ties within organizations would predict” (Mollica, Gray & Trevino, 2003, p. 123). In their study on racial homophile (self-segregation into like groups) Mollica, Gray, and Trevino discovered that racial minorities “tend to develop more homophilous networks than majorities” (p. 131) and that this behavior is likely linked to their strong identification with their racial group.

Homophilous behavior limits the social capital of minorities within a dominant culture. Social Identification Theory (SIT) demonstrates that “in-group favoritism tends to occur even in the absence of strong leadership, or member interdependence, interaction, or cohesion” (Ashforth & Mael, 1998, p.24). In other words, people identify themselves socially with various groups and share with these groups a set of common traits resulting in favoritism toward group members. Social identity is the means by which individuals make sense of and segment the social environment; it is also the means by which an individual describes himself or herself in the social environment. In-group favoritism occurs because we can more closely identify with and subconsciously support those individuals who we perceive to be similar to one’s own self. Coupled with

dissonance theory and attribution theory, we can begin to understand, and hopefully address the perpetuation of racial bias.

Dissonance theory is based on the assumption that the desire to reduce dissonance between conflicting cognitions may affect people's attitudes and judgements. Attribution theory is predicated on the assumption that people may apply self-serving attributes to others in an attempt to boost their own sense of self-worth (Kundra, Ziva, Sinclair & Lisa, 1999). Evidence shows that individuals are more likely to apply negative stereotypes to others when they are experiencing poor self-esteem. This appears to be motivated by a deep-seated need to redeem themselves and demonstrate their superiority over the situation. Individual conflict between two individuals and/or groups is likely to trigger negative stereotype activation and attribution between the parties. This effect complicates change management within a multi-cultural environment, creating polarization of views.

Combining dissonance and attribution theories with research in the field of organizational behavior, organization development, and the various psychology disciplines may prove helpful if we are to move toward a productive multi-cultural society. Theories are being developed and tested to help us understand and develop better intercultural skills. Unfortunately, due to the fragmented areas of research discipline, the rate of development and application of theories may not be fast enough to keep up with the rate of change in organizational dynamics (Neumann, Miller, & Holti, 1999).

Adding a layer of complexity to cultural diversity is a deeper level of social diversity. Social diversity is defined as the diversity in social groups, in their expectations, beliefs, education, and lifestyle. Social diversity, unlike cultural diversity,

has more to do with expectations in stature, treatment, and access to privileges – in whatever way a society may define those privileges. Social diversity is not bound by national boundaries, but by educational boundaries, and continues to become more diverse within the context of a post-industrial society.

The advent of a post-industrial society complicates issues related to inter- and intracultural relations. The concept of a post-industrial society was introduced with the information revolution; new technologies have changed the nature of wealth, with corporate assets built on intellectual capital and modes of communication rather than ownership of property and raw materials. The social changes driven by this new society have created further fragmentation of social groups as people identify themselves with particular occupations or educational backgrounds. In the 1999 forward to his classic text, *The Coming of Post-Industrial Society*, Bell (1999) provides a context for understanding the impact of a post-industrial society, he states that a

Post-industrial society makes higher education – human capital – the foundation for position and privilege in the society...achievement in school and competing on the job, become the necessary conditions for professional position (p. lxxv)...Like many advances in human history, post-industrial developments promise men and women greater control of their social destinies (p. lxxxiv).

Greater control of one's own social destiny, however, is not the only expectation. Due to the rise of a middle class in most developed countries, the societies within each country have redefined their expectations, moving items that were once considered luxuries to the classification of necessities. Material needs (desires) and the desire for social status may be a shared trait among intellectual societies, but there are also factors that keep us distinct. Cultural traditions, world-views and the transcendental power of beliefs and doctrines found in the great historic religions (Hinduism, Buddhism,

Confucianism, Judaism, Christianity, and Islam) create distinct differences in behaviors. Despite these differences there is a general trend toward higher expectations of what Maslow has described as self-actualization in the workplace (Bell, 1999/1973).

Bell predicted this trend; he commented that as disparities among persons decrease in Western society (people having equal access to affordable goods), that the expectations of equality increase even faster. The effect is that there is an expectation that 'disadvantaged' individuals be granted the same status and access to services as 'privileged' individuals. The distinguishing element, according to Bell, should not be total equality, but equal access based on equal skills. Since the equalizer becomes education and technical skills, higher education has consequently become an expectation for success.

The phenomenon created by a highly educated workforce is that the populace demands more engagement in the decision-making processes in their workplaces. The difficulty this aspect brings to organizational survival is that "when individuals demand full participation in the decisions that affect their lives, the consequence is an increase in information costs and in the time required for bargaining each against each in order to reach agreement in action" (Bell, 1999/1973, p. 475). The demand for full participation, in effect, impairs the ability of an organization to deal with rapid changes in the marketplace.

In his assessment of American economics and society, Bell (1999/1973) highlights another factor that complicates social life in a post-industrial society, he claims

The paradox is that in the nineteenth and early-twentieth centuries we had, in America, individualism in the economy and regulation in morals; today we have regulation in the economy and individualism in morals.

Inevitably, the politicization of decision-making – in the economy and in the culture – invites more and more group conflict (p. 482).

Conflicts arise when individuals expect all or most of their personal views of moral conduct to be permitted and respected. Being unique is a ‘right’, and organizations are expected to support self-actualization in a multi-cultural and socially diverse setting. Individuals now consider self-actualization in the workplace to be a need rather than a desire; the social scale of perceived needs has shifted. Organizations, in an attempt to attract and retain talented employees, have adapted to the demands of the times. There is competition for employees who are creative, innovative, and committed to helping the organization survive in an environment of rapid change. Barrett (1997) claims that in order “to achieve this goal [organizations] will need to take account of the shift in values that is taking place in society, and the growing demand of people to find meaning and purpose in their work” (p. 15). Meaning and purpose are found within organizational culture, which is based on the perceptions and assumptions of organizational members (Wilkins, 1995).

The erroneous assumption we often make when initiating change is that others are operating within the same set of cultural and social mores as are we. Hall (1969) discusses this phenomenon from the perspective of our use of language. According to Hall, people from different cultures “*inhabit different sensory worlds*. Selective screening of sensory data admits some things while filtering out others, so *that experience as it is perceived* through one set of culturally patterned sensory screens is quite different from experience perceived through another” (p. 2). This cultural patterning is different for every human being. Even among a single ethnic group, within a single nation, individual experiences in society are only shared experiences at the fringes. Individual experience,

coupled with a shift in higher expectations about the nature of work, creates a new management dilemma – managing a workforce that expects to be engaged in decision-making and to be provided workplace opportunities that utilize their unique skills and experiences.

As individuals become more insistent that individual cultural and social values be respected and preserved, there exists a possibility for heightened conflict. Bandura (2001) quite aptly describes the dilemma

The revolutionary advances in electronic technologies have transformed the nature, reach, and loci of human influence. These new social realities provide vast opportunities for people to bring their influence to bear on their personal development and to shape their social future. However, many of the contemporary conditions of life undermine the development and maintenance of collective efficacy... As the need for efficacious collective civic action grows, so does the sense of collective powerlessness. Under the new realities of growing transnational control, nation states increase their controlling leverage by merging into larger regional units such as the European Union. However, these regional marriages do not come without a price. Paradoxically, to gain international control, nations have to negotiate reciprocal pacts that require some loss of national autonomy and changes in traditional ways of life (p. 17).

The same situation exists in organizations as they become more diverse. The goal of creating a multi-cultural environment, one that respects the individuality of organizational members, is counter-balanced by the need to create a common culture that research has identified as an essential ingredient for an organization to compete and thrive (Schein, 1996; Heskett & Schlesinger, 1996). Schein (1996) claims that the process of building a viable organizational culture within a newly formed organization

occurs in three ways: (1) the entrepreneurs only hire and keep subordinates who think and feel the way they do, (2) they indoctrinate and socialize subordinates to their way of thinking and feeling, and (3) their own behavior is a role model that encourages subordinates to identify with them and thereby internalize their beliefs, values, and assumptions (p. 61).

The strategies listed above are in essence the same strategies employed to acculturate new members into an existing culture. These strategies may serve an entrepreneur in creating a new business, but these are also the types of practices that alienate talented employees. According to Work (1996) that leaders “of the future will have to have value systems sufficiently expansive and flexible to accommodate socioeconomic dynamics and rates of change greater than those of today” (p. 72). Indeed, our peaceful existence between nations may be at stake if we do not explore, test, and apply new means to peacefully co-habitate in a global economy.

ACT FOUR

Scene 11

ADAM: And I thought all I had to do was graduate with my degree in management and go out and get a job. You make the world of work seem a little scary, Minerva.

MINERVA: There is no reason to be scared. The complexities of life at any age and in any environment do make it important to understand history and your own philosophy. Without a solid anchor you are subject to the winds of change. You don't want your mind to become hard like concrete, but you also don't want it to be wishy-washy and subject to control. Your challenge, Adam, as a young person is to learn from the past and be committed to making the future better. There is an old adage that if you don't know the past you are doomed to repeat it.

JAKE: It seems just as important, Minerva, to be looking forward and to try to get a sense of where new discoveries in science are leading us.

BILL: Yes, it's rather fascinating that many of today's physicists are arguing that the

creation of the universe was by a grand design of the Divine.

JAKE: Science can offer a lot – but it is getting more and more specialized. It's hard to get a grasp on everything that is going on in science today. Still, its exciting.

MARY ANN: But you still see a lot of pessimism in the world.

BILL: True, but there is also hope.

ELLEN: That's good, because I have children and I want them to have the opportunity to live a happy and fulfilled life. Sometimes the things I read and hear in the news are frightening. We have the technology now to kill the entire planet and you never know who in the world is developing what. Everybody has access to advanced scientific knowledge. Even some of the science fiction stuff is scary today because it seems so possible.

JAKE: I guess you could call science the new form of humanism. More than ever we use science to understand and explore the unknown things about mankind. Maybe we'll find the fountain of youth.

IRENE: That's what scares me, Jake – should we?

JAKE: Should we what?

IRENE: Find the fountain of youth – some of the new science today is stretching every principle I hold dear. Some of the kids in our youth group at church don't even know the difference between right and wrong. Everything seems right. We asked them the other day if cloning was moral. They didn't know and didn't seem to care. It didn't challenge their faith at all. That's a new way to boil the frog, as Minerva would say.

MINERVA: And therein lies the challenge, Irene. We have to each explore how science

challenges our philosophy and how our philosophy frames our scientific explorations. The US has deemed some types of research illegal that other countries have sanctioned. The difference in legality is only based in our philosophy. We have to ask ourselves where science is challenging our thinking today...

Science at the Edge – the new Humanism

There is a debate raging as to the ultimate benefits of science. Some argue that science provides the promise of a productive future. Others argue that science holds the recipe and ingredients for cultural, political, and social disaster. Brockman (2003) claims that science is optimistic and serves as a counternarrative to cultural pessimism.

According to Brockman, academic humanists have created a culture of pessimism grounded in the deconstructionist movement following the war. “Key to this cultural pessimism is a belief in the myth of the Noble Savage – that before we had science and technology, people lived in ecological harmony and bliss. Quite the opposite is the case” (Brockman, 2003, p. 5). Brockman credits this optimism to

First...Scientists are constantly acquiring and processing new information...there has been a doubling of computer processing power every eighteen months for the past twenty years, so too do scientists acquire information exponentially. They can’t help but be optimistic...

[S]econd, much of the new information is either good news or news that can be made good thanks to ever deepening knowledge and ever more efficient and powerful tools and techniques (p. 5).

His own optimism spills over into his predictions of the role of science in the twenty-first century. To Brockman and a community of ‘believers’ science is the source of a new

culture, one that will be pervasive and bring with it a new optimism about the future of mankind.

In short, something radically new is in the air: new ways of understanding physical systems, new ways of thinking about thinking that call into question many of our basic assumptions. A realistic biology of the mind, advances in physics, information technology, genetics, neurobiology, engineering, the chemistry of materials – all are challenging basic assumptions of who and what we are, of what it means to be human. The arts and the sciences are again joining together as one culture, the third culture. Those involved in this effort...are at the center of today's intellectual action. They are the new humanists (p. 8).

On the opposite side of the debate, political economist Francis Fukuyama (2002) argues that we are seeing the fruition of the predictions of Aldous Huxley in his book *Brave New World* (1932).

Many of the technologies that Huxley envisioned, like in vitro fertilization, surrogate motherhood, psychotropic drugs, and genetic engineering for the manufacture of children, are already here or just over the horizon. But this revolution has only just begun; the daily avalanche of announcements of new break-throughs in biomedical technology and achievements such as the completion of the Human Genome Project in the year 2000 portend much more serious changes to come...

[T]he most significant threat posed by contemporary biotechnology is the possibility that it will alter human nature and thereby move us into a 'posthuman' stage of history...a technology powerful enough to reshape what we are will have possibly malign consequences for liberal democracy and the nature of politics itself...[the danger of biotechnology], in contrast to many other scientific advances, [is that] it mixes obvious benefits with subtle harms in one seamless package (as cited in Fukuyama, 2002, p. 5-7).

Fukuyama projects several scenarios, all of which combine 'good effects' with what he perceives to be threats to human nature. For example, advances in neuropharmacology may enable psychologists to change the human personality at will – one for weekdays and another for the weekend. Or, with advances in stem cell research, we will be able to extend life – but will we be able to slow the aging of the brain? And what of ethics? The

ability to screen embryos before implantation could result in a new class system – those who are genetically superior versus the ‘unscreened’. Fukuyama points out that in the future the very science that Thomas Jefferson credited with demonstrating the equality of man may create inequality. Jefferson wrote “science has already laid open to every view the palpable truth, that the mass of mankind has not been born with saddles on their backs, nor a favored few booted and spurred, ready to ride them legitimately, by the grace of God” (as cited in Fukuyama, 2002, p. 9). Fukuyama asks, “What will happen to political rights once we are able to, in effect, breed some people with saddles on their backs, and others with boots and spurs?” (p. 10).

Whether one thinks of science with optimism or pessimism, the point is that both views express an acceptance of physicalism – that everything is physically constituted.

The logical positivists in the first half of the [twentieth] century...were much exercised by the question of whether the different branches of science, from physics to psychology, should all use the same method of controlled observation and systematic generalization. They paid little or no attention to the question of whether everything is made of the same physical stuff.

By contrast, physicalism, as it is understood today, has no direct methodological implications (Papineau, 2000, p. 174).

Physicalism is a philosophy that has displaced phenomenology and is “due to contemporary agreement on the completeness of physics...there is now good reason to believe the empirical thesis that all physical effects are due to physical causes” (Papineau, 2000, p. 203). As a result there is now general acceptance in scientific circles that “the mind is in some way constitutively connected with the brain”(Papineau, 2000, p. 176). In other words, the mind is a physical part of the brain and as such, is physical and so it can therefore be manipulated by physical means. With this philosophy, then the questions posed by scientists reach into the very essence of what it means to be human – the human

mind. If the mind can be explored with science we are then faced with the ethical questions of how much and how far?

And while we debate the ethics of biotechnology, our philosophies of life are being assaulted on another front – from the field of computer science. What, you might ask, does computer science have to do with philosophy and religion? Computer scientists, working on the development of artificial intelligence, begin fundamentally with the questions: What are minds? What is thinking? In their efforts to make ‘thinking’ computers, scientists must first determine how the human mind ‘thinks’. The efforts of multiple scientific disciplines unite in the research on artificial intelligence (AI).

According to philosopher John Haugeland (1985), researchers in AI want “only the genuine article: *machines with minds*, in the full and literal sense. This is not science fiction, but real science, based on a theoretical conception as deep as it is daring: namely, we are, at root, *computers ourselves*” (p. 2). AI represents a culmination of centuries of philosophic and scientific endeavor converging in the field of cognitive science.

Researchers in AI return to basic Aristotelian philosophy, with the notion that there is a direct relation between thought and thing – ideas are like pictures or images, symbols of material things. Add Copernican discoveries that led to the realization that observed reality is not always accurate (e.g. just because we see the sun ‘rise’ doesn’t mean it rotates around the earth), and mix in the mathematical approach of Galileo, who used mathematics to represent concepts other than space, and you have the basic science for computers. Descartes and Hobbes took the science of Copernicus and Galileo and applied it to the mind. Hobbes claimed that thoughts are not spoken or written symbols; he described thoughts as ‘phantasms’ or ‘parcels’. He described thoughts as a system of

mechanical rules where the ‘parcels’ were moved about according to the rules of reason. Confusion is the result of a thought process that does not follow the rules. Hobbes’s theory fell short of describing how these parcels develop meaning.

Descartes provided the next major breakthrough in cognitive science with the development of analytical geometry. Through his research Descartes redefined the field of mathematics. Whereas Galileo abstracted Euclid’s spatial geometry to apply it to problems of physics (time and speed), Descartes took mathematics to a new level – geometry, algebra, and physics all became applied math. Mathematics, as such, has less to do with any specific subject matter and more to do with the relationships that might be found in them. Surprisingly, Descartes’ mathematics has a profound impact on the philosophy of mind – it produced a reconception of the relationship between symbols and what they symbolize, and therefore a new theory of meaning. Descartes extended his mathematical notations to produce a new model for thoughts, applying all of his conclusions about representations to the workings of the mind. With his conclusions, and his dualism (the mind and the physical universe being two different kinds of substance), Descartes kicked off the debates that have consumed philosophers for centuries. The sharpest contrasts in philosophy between the two ends of a spectrum anchored on either end by dualism and materialism. Dualists arguing for a distinction between mind and matter; materialists arguing that the brain is matter, and if so, then the mind and its thoughts are somehow built up out of matter. The challenge is that dualists can explain the presence of an immortal soul and materialists do not.

Then in the eighteenth century David Hume wrote his *Treatise of Human Nature* in which he established a new category of human sciences based on the model of the

physical sciences. His purpose was to discover the laws and forces by which ideas are governed and directed, much like Newton had established the laws of physics for the universe. Following Hobbes and John Locke, Hume developed a theory on the association of ideas. Hume did not claim that ideas *are* physical (unlike Hobbes), but that ideas are *like* physical particles in that their interactions can be explained by a set of physical laws based on natural forces. Hume wasn't attempting to develop a hypothesis about *why* ideas follow a set of laws, but simply *how* they follow a set of laws (just as Newton didn't explain the *why* but the *how* in his laws of planetary motion).

In his theory Hume was not able to account for how ideas develop meaning, and that once again set up the debate that was championed by philosophers such as Kant and Hegel. Transcendentalism took the notion of ideas to a new level. But the paradox of mechanical reason refused to die and was carried on by the empirical sciences into the twentieth century and resurrected in the study of the cognitive sciences and the push to develop AI. In 1943 neurobiologists Warren McCullock and logician Walter Pitts developed the first artificial neurons. With the development of cheaper computers in the 1970s, development in the field picked up pace. Artificial neural networks proved to be highly adaptable. Just as the human mind categorizes an image as a 'face' even if it is a stranger, so to do artificial neural networks make generalizations from representative examples – they can actually 'learn' information. In the latter half of the twentieth century computer scientists continued to advance, refine, and 'micro-size' artificial neural networks.

Meanwhile, computers enabled a wide variety of experiments with game theory, chaos theory, 'games of life', and experiments in semantics. Research has led to the

development of computers that can think, solve problems, and learn. The question that remains to be resolved is whether or not AI can accommodate feelings and does it need to? The common view held today is that robots have no feelings – they may be rational and thinking, but in a cold, logical, efficient, and insensitive way. Both science, philosophy, and modern culture now view thought and feeling as separate things – that somehow understanding and affect are fundamentally separate and distinct from one another. However, there is currently a field of neuroscience that explores the foundations of human and animal emotions referred to as ‘affective neuroscience’ (Haugeland, 1985; Tallack, 2001).

The basic premise of affective neuroscience is

that emotional processes, including subjectively experienced feelings, do, in fact, play a key role in the causal chain of events that control the actions of both humans and animals (Panksepp, 1998, p. 16).

Affective neuroscience, in effect, demonstrates how emotions

provide various types of natural internal values upon which many complex behavioral choices in humans are based. However, such internal feelings are not simply mental events; rather, they arise from neurobiological events. In other words, emotional states arise from material events (at the neural level) that mediate and modulate the deep instinctual nature of many human and animal action tendencies, especially those that, through simple learning mechanisms such as classical conditioning, come so readily to be directed at future challenges...

In other words, emotional feelings not only sustain certain unconditioned behavioral tendencies but also help guide new behaviors by providing simple value-coding mechanisms that provide self-referential salience, thereby allowing organisms to categorize world events efficiently so as to control future behaviors...

Once we can specify distinct brain systems that generate emotional behaviors, we can also generate biologically defensible (as opposed to simply intuitive and behaviorally based) taxonomies of emotions (p. 16).

Research and discoveries in the field of affective neuroscience have been applied to the science of artificial intelligence. At this point in time the application is primarily in the

arena of mimicking human emotion in artificial systems in order to improve communication with humans (Okada, 2000; Panksepp, 1998).

In 1995 theologian Anne Foerst joined the Massachusetts Institute of Technology (MIT) to teach a course addressing the relationship between theories about human nature and intuitive and cultural self-understanding. Her perspective was that “we tend to apply our own intuitive sense of ourselves to our theories about humans...[we place ourselves] in a circle in which culturally influenced intuitions about ourselves and scientific theories about human features are intertwined and cannot be separated from one another” (Foerst, 2001, p. vi). The AI lab at MIT is a place where people attempt to build humanoid robots on the analogy of human infants. Foerst immediately initiated a dialog on understandings of humans in AI and in Christian theology. There ensued a series of heated debates “about mechanistic explanations of human features and the usefulness (or uselessness) of religion. The vast majority argued in a fairly reductionist way but, yet, a few people held religious beliefs” (p. v). Foerst observed that the emotional nature of the debates stemmed from a natural tendency in humans to ask questions in the search for meaning. She noted that most people search for meaning in the realm they know best, and for a scientist that is in the realm of their particular scientific discipline. In 1997 she started the ‘God and Computers’ project.

The ‘God and Computers’ project was a series of lectures delivered by famous scientists concerned with human nature in which the speakers addressed questions about themselves and their perspectives on the meaning of life both within and outside of their research. Over the course of the first three years the series took place (1997-1999) the audience consisted of MIT faculty, students, ministers, professors from the Boston area,

and some interested laypeople. The topic of each of the four series was on ‘Mind, Science, and Metaphysics’. The description of the first year of lectures claimed that

a variety of atheists, agnostics, Buddhists, Hindus, Christians, and Jews will discuss the relationship between religion, cognitive science, and computer science. Each speaker will present a different approach on how to deal with existential issues within and outside of a scientific research program. The talks will give some impressions of the people behind the scientists, and cover both the scientific and the personal point of view (MIT, 2005).

The second year included a series of lectures by noted computer scientists. The senior dean at MIT, Bruce Randolph, talked about the history of religion at MIT. But it was the third year that created the greatest stir and the largest audience attendance in the three-year run of the lecture series. In 1999, the last year of the series, Foerst invited only one speaker to deliver all six lectures, the Stanford University computer scientist Donald Kunth.

During his final lecture Kunth provided an insight into why scientists at the end of century were returning to spiritual faith. He described the *science* part of computer science as a basis for gaining insights about God. The focus in computer science on abstract notions of processes, the theories on how to deal with large quantities of nonuniform data in dynamic ways, and the computational models all provide intimate connections with the role of God as creator and sustainer of the universe. In effect, a computer scientist creates and maintains mini-universes.

Kunth also posed an argument that refuted Newton’s perspective that God created a large mechanism (clock-work) and then stepped outside of it to let it run. Kunth argued that God is present and involved in the material universe. To demonstrate his point, he used a computer and a biologic analogy. The computer scientist creates a program in a

distributed computing environment where there are lots of cooperating processes but only one program. This is much like an ant colony, which can be thought of as a single organism, or as all the individual neurons in the human brain are part of a single person (Kunth, 2001).

And so, science once again swings back to openness to things spiritual. Just as the initial theologians were also scientists, searching nature for evidence of *how* God set up the universe; scientists are now becoming theologians, searching for purpose and *why* God set up the universe. The convergence of science and religion is happening across the various scientific disciplines and is emerging in the public domain. Indeed, many of the science books in bookstores today deal with topics like *Science in Culture* (2001), *Brain Science and the Biology of Belief: Why God Won't Go Away* (2001), *Modern Physics and Ancient Faith* (2003), and *The Science of God: The Convergence of Scientific and Biblical Wisdom* (1997). In the opening to his book *God & the New Physics* (1983) Paul Davies shared a quote by Albert Einstein "Religion without science is blind. Science without religion is lame" (p. ix); Davies expounds on this with his own opinion that "science offers a surer path to God than religion. Right or wrong, the fact that science has actually advanced to the point where what were formerly religious questions can be seriously tackled, itself indicates the far-reaching consequences of the new physics" (p. ix).

Science is converging with religion and the humanities. This convergence is demonstrated in daily life and the personal philosophies that we carry into our organizational interactions. We now see biological models of systems translated into communication models as in Barabasi's (2003) book *Linked: How Everything is*

Connected to Everything Else and What It Means for Business, Science, and Everyday Life, or Zimmerman and Plsek's (2001) book *Edgework: Insights from complexity science for health care leaders*, and Kelly and Allison's (1999) book *The Complexity Advantage: How the Science of Complexity Can Help Your Business Achieve Peak Performance*. The new resurgence of interest by scientists in things spiritual has produced a new wave of articles and books about the application of spirituality in the workplace such as Lewin and Regine's (2001) book *Weaving Complexity & Business: Engaging the Soul at Work*, and their article *The Soul at Work: Human Capital with a Human Face* (2000). Rosner (2001) wrote *Is There Room for the Soul at Work?* claiming there is a "new emerging management field of spirituality at work" (p. 82). New consulting organizations have emerged that teach spirituality in the workplace. According to Lance Secretan, a consultant and founder of Secretan Center, Inc. "The modern corporation has the clout, the power, the reach, and the intellect to change the world – for good or evil" (as cited in Taninecz, 2002, p. 8). Secretan claims that leaders who are taught to dominate and motivate, punish and reward are unable to inspire or motivate; he teaches instead a spiritual message of love and trust. His 'preaching' has attracted more than 200,000 people annually in business, government, and academic organizations. Tischler (1999) commented on the increasing interest of people in organizations to find meaning, personal and professional and spiritual growth.

The shift toward spirituality was not driven by traditional religion; it was the result of an acceptance and promotion by the intellectual elite, the scientists in society, of the concept of God and human spirituality. Science has brought the private matter of religion and spirituality into acceptable form inside organizations. Science is uniting with

the humanities and religion. The new borderlands of science have absorbed art into science and expanded the borders of human ingenuity in the arts. Likewise, where science once rejected metaphysics it is now absorbing it as an area of scientific exploration. Metaphysics is no longer the domain of theologians and philosophers. As we explore the borders of science we must ponder the impact of science and philosophy on human interaction. Where will new research in physics, biotechnology, computer science, neuroscience, social science, and all the other areas of science take us? In order to assess all the latest 'management fads' it is important for us to understand the history of human knowledge, to know where great minds have gone before, and to be prepared to explore new discoveries and to judge their merit on a strong philosophical foundation.

(the lights fade as each of them sits and ponders Minerva's final words)

ACT FOUR

Scene 12

(lights up)

(The scene opens with everyone standing in the Great Room with their coats on and luggage at their feet – everyone is laughing and talking at once)

(Bill claps his hands to get everyone's attention)

BILL: I just want to take a minute for all of us to thank Abby and David for being
such wonderful hosts during our stay.

(everyone applauds them)

BILL: Next, I want to thank Minerva for four engaging days of storytelling and

conversation. I think I have enough to think about to keep me lost in study for the next five years.

(everyone acknowledges his speech with nodding heads and words of agreement)

BILL: I think the most profound impact these four days have had on me is to broaden my understanding of other people. I have been an army chaplain for most of my career. I thought I had seen it all and was open to almost anything. These four days proved me wrong. I found myself uncomfortable with a lot that Minerva had to share. I found myself wanting to close off some of it. Instead I was forced to acknowledge those things that made me uncomfortable and to examine my own philosophy of life. I think Minerva helped an old preacher open up to new ideas and to let down my guard a little. I am leaving here with a new sense of humility and a commitment to examine my philosophy of life. The world isn't as black and white now as it was when I arrived last week. I am leaving with a question in my mind...Do I really have any of the right answers?

JAKE: Spoken like a true preacher, Bill. But I think I'd like to follow suit. *(turning to Minerva)* Thank you, Minerva, for opening up my mind as well. I'm not as religious as Bill, but I think I was certainly more rigid. I really thought I could control everything in my life. I'm an engineer...I thought I could calculate and create a plan for almost anything. I'm going home to call my wife and see if she will be open to trying to get back together. She always seemed too emotional to me, now I see that I was the one who was too rigid. I was trying to control her rather than listen to her...I think I was a subject of that behavioral school of

training and thought I could use it on anybody...Thanks for the insights that help me change that way of thinking.

TONI: I thought about all this last night...I plan on taking what I have learned back to my class room. I realized that I was trained to teach...Now I need to be educated and dangerous, so I can pass that dangerous education on to my students! I want them to be able to think critically on their own. If I don't, I set them up to follow the next charismatic answer-man.

MARY ANN: Toni, you're a wonder. Here you have a plan. My head is still swimming. I am leaving with more questions in my head than I have asked myself in my entire lifetime. I thought I had all the answers, and now I don't have any. (*looking at Bill*) I may even call you Bill to see if you can help me sort it out – 'cause now I don't think my psychologist is going to help me through the types of questions I've got.

JUSTIN: I know I haven't had much to add over the last few days, but I have been fascinated just to sit and listen. I guess I am leaving with a sense of wonder that I never had before. I studied history in high school but it always seemed so dry. I never thought about how it all affects me in my own life. I'm Catholic, but I don't go to church much, and I sure didn't know my own Church history. My faith in God isn't changed, in fact the whole four days only convinced me more that He exists. But I do wonder now about all the organized religions. I've always believed because I was taught to believe...now I feel a need to read and study on my own. I guess I am leaving with a question as to what I believe and why?

LINDA: Justin and I make an interesting pair – because I wasn't raised in a church at all.

I am curious now about all this religion stuff and I think I'll study with him. But I think the thing that intrigued me the most about the last four days was how complex life is. I just go through each day trying to do my best; I never thought about life having any other meaning. But hearing all the stories about famous people and regular folks makes me want to examine my own life. I guess I am wondering if I am here for a reason, and if so, what is it?

IRENE: That's a good question, dear, and one worth asking. I think you will enjoy the discovery process, even if it is sometime painful. I actually want to thank all of you. Watching each of you and listening to Minerva's stories has renewed my faith in our abilities to meet the challenges in this old world. I think we all just need a little time to be snowed-in, so we can stop long enough to reflect. I guess the question I am leaving with is how do I pass along this wonderful gift?

GEORGE: Ok, I guess it's my turn. I am sorry I missed the first day of discussions. I'll have to get some history books and catch up on what I missed. But even so, I have to admit that I did learn something. I know I can be a little bull-headed. I've always gotten done what I needed by being an efficient boss. I suppose I have to question whether my style gets the best results. My staff has been with me a while, but I pay them really well. Maybe I need to try some of the basic stuff like Elton Mayo experimented with.

ELLEN: Good, George. And try a measure of that at home as well, the kids and I would love it. (*grimace*) There I go again. Sometimes I feel like a nag. I do the same to my staff. I'm always running off half-prepared working on sheer emotional energy. I get so tired. I think this storm was good for me as well. I got to slow

down. I had never even heard or read anything about management history until now. I have always just reacted and done what seemed right at the time. My best lesson is probably that history can teach me something and help me be a better leader. I will have to study some more so I can understand what works and why and in what situation.

ADAM: Guess that leaves me. This has been a great four days. If you had asked me before if it would have been a good time to be snowed in with a dozen old folks I'd have thought you were crazy. But you guys are alright. Tell you what Minerva, I'll give you my contact info and you check in on me in about ten years and see if I learned anything and applied it to my life. My dad always says forewarned is forearmed. I think you gave a lot of warning that will help me be better armed for engaging in life. And I think I'll go read up on Einstein and all the time-space continuum stuff. Pretty cool.

MINERVA: My pleasure, everyone. And I'm glad that I was able to contribute in some small way to each of your lives. Like Einstein said – all matter, space, and time are connected. Maybe our meeting in a snow-storm was meant to be.

ABBY: Maybe, Minerva, maybe.

DAVID: It's been a pleasure having all of you here. Our maintenance guys are here to help you with your luggage. Bundle up, its pretty cold out there.

(everyone puts on their coats, continuing to talk while they gather up luggage and head out the door).

(we hear Abby and David calling out goodbye from behind the scene, the sound of a door closing, and the two of them walk back into the Great Room).

DAVID: Well Abby. This has been an interesting four days.

ABBY: Not exactly our normal group of skiers, eh?

DAVID: No...This is a group I won't likely forget. Minerva's stories have left me with
more questions than answers.

ABBY: I know...If the old adage "history repeats itself" is true – where do you think we
are headed next?

DAVID: I don't know...I guess that depends on what we believe...

(lights fade)

Chapter Three

Epilogue

The premise upon which this play was written was to research the question: *What relationship and possible timeline can we discover between philosophy, science, and literature that can help us understand the forces that impact management theory within organizations?* The research question was approached using qualitative research methods.

Reflection on the research method

The actual writing of the story line that was shared by Minerva took place in an emerging fashion over a period of ten months. During that time the researcher explored the writings of various historians and authors who wrote contemporary pieces within their time in history. The goal was to gain an understanding of the events that took place within any particular time period in the context of the culture at the time.

Initially a time-line was established that marked the major and minor events from 4000 BC to 2005 AD. The purpose was to populate a timeline that noted the significant scientific discoveries, philosophic (including political) thought, literary pieces, and business changes throughout human history. This timeline was utilized to guide the research. The main story line developed around these events. The researcher remained open to new discoveries and allowed those discoveries to guide the development of the

research. The challenge was to remain focused on the research question, as there were many divergent streams of thought that could be followed.

After the main story line was developed the four-act play was embedded into the story. The purpose of the play was to bring history forward and to help the reader understand the relevancy of historic thought to the present day world. The intent of the play was not to present answers, but to bring the content to life; to allow the actors to struggle with the concepts and to encourage the reader to find relevance of the content independent of the researcher.

Reflections on the Research Question

But did the research answer the research question? The topic area is very expansive. The answer Einstein might have offered is ‘of course – all things are related in the time-space continuum’. As a result of exploring the topic, I, as the researcher, would answer ‘yes – I find a direct interaction between science, philosophy, and management theory’. After more than a year of immersion in the topic I find the interaction present all around me. Einstein theorized that if we move fast enough we could actually re-enter time in the past. The challenge we may have is to understand his theory and take note.

At one time everything in the world was focused on the spiritual. Then mankind determined that through science we could control our environment. We attempted to do so and are only now beginning to realize the consequences of those controls. We are now coming full circle and seeking the spiritual side of life. Even those who reject any formal religion seem to be open to considering the presence of a Great Spirit. Aristotle spoke of Spirit. Science and philosophers denied spirit during the eighteenth century. We worked

hard to control the material world, found we couldn't, and we are back to considering a Grand Designer.

This cycle exhibits itself in a microcosm of history referred to as management history. The story began with the Industrial Revolution when science deemed humans to be no more than part of a great machine. Scientific management attempted to control the human side of the organization. Then came the behavioral sciences and we believed we could train a response. And now we have cognitive science challenging our assumptions about the material nature of the brain. As a result spirituality is now showing up in the work place.

In my opinion the timeline or link between science, philosophy, and management theory has shortened. One of the reasons there appear to be so many management fads is that science and philosophy are going through revolutionary paradigm shifts at a faster rate than at any other time in human history. It no longer takes centuries or decades to change our view of the world. The Internet and news media have forced us to look at and contemplate changes every year or two. Government funding of science has provided the backing and impetus for specialized scientific research, each area of which challenges the others to move faster and question more of our perspective of reality.

To paraphrase the management guru Peter Drucker – change happens so quickly now that we can no longer manage it, we have to figure out how to stay ahead of it. In conducting this research project, I find myself agreeing with Drucker. There are no indications that the rate of change will do anything other than continue to accelerate. Science, philosophy, written communication, and management theory are intimately linked; the continuum that joins them allows very little time for human adaptation before

the next shift. Each new generation possesses skills and expectations that their parents and grandparents find mind-boggling.

Implications for future research

Through the course of this research there were several strands of research that were abandoned in order to keep the project in scope of the original research question. Of these the one that I found most fascinating was the exploration of the link between education and servant leadership. During discussions with advisors and peers I was fascinated by a question posed by one of the characters: Is education dangerous? I think I would flip that question and ask: Is training dangerous?

As we discussed these questions we reflected on the philosophy of Hegel related to the relationship between master and slave. Is there, for example, a relationship between being a master, receiving training, and a lack of maturity, versus the slave, with maturity of thought, and the pursuit of education? Socrates would claim that the unreflected life is not worth living. Has the master reached a point of dominance that he/she no longer reflects? In Roman times this might have been true. Young Romans were trained to be masters and how to treat (or mistreat) slaves. Education and scholarship *should* bring about reflection. Training, on the other hand, teaches a set technique, how to *master* a thing. From these questions there is a myriad of research streams that can be followed. For example: is there a correlation between success as a leader (measured in any number of terms) and the *type* of education of the leader? Is their success as a leader related to the lack of advanced education, a liberal arts education, a Masters in Business, a Masters in Leadership, an educational degree, etc. One thought that several of us had is to explore the notion that education forces reflection – and if so then maybe all business managers

should be required to have a liberal arts education. And if so, then are universities really providing the type of courses that prepare a new generation for leadership roles in a world of rapid change?

Conclusion

The goal of this research project will have been reached if, upon reading and reflecting on the topic, the project has left you, the reader, with a sense of curiosity. You may not agree with my conclusions, but, as we know, qualitative research is not generalizable. And therein lies the beauty of it. Qualitative research opens up doors to new discoveries and new paradigms; it provides new ways of exploring a topic. If this project has given you cause to reflect and engaged your mind then the investment of time will have benefited more than myself.

In the spirit of qualitative research, the research question was approached with an open mind, full engagement with the topic (immersion), and in an open-ended manner. I must also acknowledge, however, that we often find that which we are looking for. I presented the information from history in topical format, using examples of predominant thought from each time period. But as I searched historical text, I looked for the links between science, philosophy, and management theory. As a result, I may have found that which doesn't exist. But I find that highly unlikely. The rate of change in the twentieth century has become almost exponential. Philosophy that constituted cultural norms thirty years ago has faded away in the onslaught of technological advancement. Changes in management theory quickly follow new discoveries in science.

If we are going to follow Drucker's advice we need to give up managing and learn to lead. Change is now the new constant. The books on managing change have

given way to books on leading change. The books on control charts and six-sigma process improvement are already falling out of favor in lieu of books on engaging human spirituality at work. New research on AI will soon show up in management books – maybe something like managing the neural network. Regardless of the change, it will be important for managers of the future to have a better grasp on history, a sense of their own philosophy of life, and the ability to provide employees with a safe haven in the storms of change.

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