

NICOLAUS COPERNICUS (1473-1543)

- a case study in the integration of science and religion.

Major contribution: promoted a heliocentric, as opposed to a geocentric, view of the universe. Suggested it was simpler mathematically to compute the movements of the planets making these assumptions than to presume that the earth was the center of the universe. His views revolutionized planetary astronomy.

Life: studied under Brudzewski a mathematician at the University of Cracow Poland, who, although a supporter of the geocentric point of view, awakened his genius.

studied in Rome, where he had been sent to prepare for church service, under the astronomer Novarra de Ferrara who encouraged him to observe the heavens - Copernicus recorded his first observation on March 9, 1497.

became a priest/advisor at the cathedral of Frombork - subsequently sent back to Italy to study medicine and mathematics at the University of Padua.

returned to Frombork - treated the poor and became an earnest student of astronomy - although asked to help reform the calendar in 1514, he declined because he did not think the positions of the sun and moon were known with enough accuracy to reassess the issues.

made over 27 published observations on the orbits of the planets between 1497 and 1529.

became increasingly dissatisfied with the Ptolemaic system because his accumulated observations made it increasingly necessary to rearrange the deferents and the epicycles which the Ptolemaic system contained. It became laborious to compute the future positions of the sun, moon and planets this way.

was convinced the Ptolemaic contained a basic error - re-read ancient Greek philosophers of the 3rd century BC and discovered that a heliocentric view had been suggested. Found that this idea made for simpler computations and was easier to conceive - however, he still believed in the circular orbits of the planets.

he believed these ideas but did not publish them - He circulated a summary of his ideas in 1530 without diagrams or calculations - Pope Clement VII approved publication of the ideas - in 1540, Rheticus (a devoted student of Copernicus) attempted to publish the writings in Nurnberg but because of the opposition of Luther and Melanchthon went to Leipzig where Osiander and Shoner took over the job.

De revolutionibus orbium coelestium was published in 1543 the year Copernicus died - contained six books.

GALILEO GALILEI (1564-1642)

- a case study in the integration of science and religion-

Faithful Roman Catholic; Italian mathematician, astronomer, and physicist.

Major contributions to science: (1) first person to use the telescope to study the skies; (2) showed the moon was not a perfect sphere; (3) amassed evidence that demonstrated the earth revolved around the sun; (4) pioneered work in gravitation and motion - informally stated Newton's first two laws; (5) re-established "mathematical rationalism" as the basis for studying the world over against the Aristotelian logic - said "the Book of Nature is written in mathematical characters".

Life: born at Pisa. entered the university to study medicine - overheard a geometry lecture - became interested in mathematics -

two legends: the legend of the lamp - the cathedral (became Newton's first law of constant velocity) and the legend of dropping weights from the tower (became Newton's second law uniformly accelerated motion)-

Became professor of mathematics at University of Padua in 1592 - did much of his creative work here - adapted the telescope for study of the skies - demonstrated his discoveries to the Vatican in 1611 and wrote Letters on the Sunspots in 1613 (espoused the Copernican theory) -

Aristotelian professors and Dominican preachers alarmed - referred Galileo to the Inquisition - Galileo wrote defending himself saying that the church had always interpreted scripture allegorically and that it would be a "terrible detriment for the souls if people found themselves convinced by proof of something that it was made then a sin to believe"-

Cardinal Bellarmine insisted that "mathematical hypotheses" have nothing to do with physical reality - declared Copernicanism "false and erroneous" - put Copernicus on the Index in 1616 - warned Galileo not to "hold or defend" the doctrine although he could discuss it as mere mathematical supposition.

Galileo sought to have the decree revoked in 1624 but the Pope did say he could write about the "systems of the world" (Ptolemaic and Copernican) as long as he was noncommittal and that he concluded with a statement that we cannot presume to know how the world is really made since God is omnipotent and we must not presume on his power

Published Dialogue on the Two Chief World Systems in 1632 - espoused Copernicanism - Pope ordered a trial - 1633 Galileo recanted - he "abjured, cursed and detested his past errors"

GALILEO (1564-1642)

- a case study in the integration of science and religion -

Galileo Galilei was the Italian astronomer, mathematician and physicist who became known as the father of the NEW science. The NEW science was based on experiment and mathematical laws rather than on the Aristotelian deductive logic which had characterized the science of the Scholastics and St. Thomas Aquinas. Galileo stated, "The Book of Nature is written in mathematical characters."

In contrast to the Scholastic contention that objects moved because they were seeking to fulfill the purpose for which God created them, Galileo proposed that they moved because they were pushed or pulled by some external force. By the experiment of rolling objects down an inclined plane, Galileo disproved the Aristotelian contention that objects of different weight fell at different speeds. Although he did not use the term, he suggested that some force pulled objects to the ground at a uniformly accelerating rate regardless of their weight. This rule, he contended, can be expressed mathematically. Thus, the NEW science combined experiment, or "ordeal" as he termed it, and mathematical reasoning.

Furthermore, objects came to a stop (e.g. a wagon without a horse), not because of a natural tendency to "rest", as the Scholastics had insisted, but because of friction. To move an object, there had to be force enough to overcome friction resulting from the surface of the object and its weight. Galileo's reasoning was the precursor to Sir Issac Newton's postulation of "gravity" and his "mechanical laws of motion". As Galileo said, "These conceptions give a view of the world as we do NOT experience it."

This concerned the Catholic church because it perceived that Galileo had substituted a "descriptive" for a "teleological" explanation of natural events. He countered by saying he, as a scientist, was concerned with "how" things move, not "why." He insisted that his discoveries were not a challenge to faith. He was a faithful Catholic and suggested that the study of nature was, along with scripture, a way of knowing God. His rules of motivation were, for him, "immediate", not "final", explanations.

In addition to his innovations in experimental physics, Galileo was the first to apply the telescope to the study of the heavens. In the early 1600s he announced a series of discoveries which were to lead him into further controversy with the church. He discovered that the surface of the moon was irregular and not smooth. He also observed spots on the sun. This led him to assume in writing a stronger position in support of the Copernican theory that the sun, not the earth, was the center of the universe. Ptolemy, who the church had embraced, has contended that the planets were perfect spheres which existed in concentric circles the farthest of which was heaven. To suggest that the moon was not perfect and that sun spots moved across the face of the sun was evidence contradictory to this contention.

Although Copernicus had written in German, Galileo wrote in Italian and was a popular expositor of his convictions. His book, Dialogue of Two Chief World Systems (1632) was immediately put on the Index. Some 8 years earlier he had been forbidden to write about his ideas. He was ordered by Rome to recant. He confessed to heresy. In 1980 the pope called for a new study.

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SIR ISSAC NEWTON (1642-1727)

-a case study in the integratin of religion and science-

English scientist and mathematician who was one of the major figures in the history of science.

Major contributions: (1) developed the binomial theory and the method of fluxions which became the essence of differential calculus; (2) experimental analysis of the composition of white light and the nature of colors; (3) discovered the gravitational force that hold the moon in orbit; (4) invented the reflecting telescope; (5) wrote Mathematical Principles of Natural Philosophy (the Principia) from which began the whole developoment of modern science; (6) proposed laws of motion.

Religion: profoundly religious, anti-trinitarian, refused Holy Orders, labeled a "Judaic monotheist of the school of Maimonides", God writes in the book of nature as well in the book of the Bible.

Life: - mother widowed shortly before Newton's birth, left him with her mother when she moved to be with her second husband.
- he became the best student in school after a fight - brought home to run the farm at 14 after step father's death.
- was an absent minded farmer; was interested in mathematics; uncle sent him to school to prepare for Cambridge.
- after graduation while at home on the farm during the Great Plague discovered the binomial theorem and the theory of fluxions (integral calculus), the composition of white light and the discovery of gravity (cf the story of the apple).
- became professor of math. at Trinity College, Cambridge in 1667 - recognized as a 'man of exceptional ability'
- extremely interested in optics - the science of color and spectrum analysis are based on his discoveries
- controversy with Robert Hooke on the nature of theory - Newton strongly advocated experimentation, i.e. let facts reveal properties, then move slowly to hypotheses.
- advocated the particle theory of light as against the wave theory of Hooke.
- on the basis of the apple falling to the earth, proposed universal gravitation as the one force which keeps planets revolving around the sun, moons around planets and objects falling to the earth -
- published the Principia in 1687 - herein proposed a single mathematical law which would explain the movements of the planets, the tides and the motion of objects on the earth.
- proposed three laws of motion: a body continues to move or remain at rest unless acted upon by another body; amount of force is proportional to mass and acceleration; all bodies attract each other with a force proportional to mass and distance.
- defended Cambridge against James II's attempt to have a Benedictine monk appointed without taking the oaths.
- was elected president of the Royal Society in 1703, re-elected each year unti his death in 1727, knighted in 1705.

SIR ISSAC NEWTON (1642 - 1727)

- a case study in the integration of science and religion-

Issac Newton was an English mathematician and physicist who became known as the "father of modern science". He was born the year that Galileo died. He completed the revolution which Galileo had started. He invented the calculus which provided a means of expressing the laws of nature in a form superior to geometry on which Galileo had depended. He performed many ingenious experiments on mechanics and optics. Most importantly, he used his creative imagination by going beyond Galileo's "force" idea to the postulation of an unseen reality termed "gravity". Gravity, according to Newton, explains the orbit of the moon around the earth and the earth around the sun. The moon is being pulled toward the earth and the earth is being pulled toward the sun. This force pulled things down to earth not up to God as the church had contented. By the time of Newton the Copernican theory was accepted without question.

Newton published two major works: Opticks and Principia. The former volume reported his extension of the experimental method to the "properties" of things, such as color. As opposed to philosophers who deduced that color was an innate quality, Newton contended that all color came from refractions of white light. He broke light down by forcing it through a prism. This idea resulted from "establishing properties by experiment".

Just as Newton extended the methods of the new science downward to the properties of natural objects, so in his Mathematical Principles of Natural Philosophy (the Principia) he extended mathematical reasoning to the heavens. For the first time science was able to explain the whole universe by a single mathematical law.

Newton was a religious person. However, his religion was not based on revelation, but on observation. The purpose of God could be empirically rather than rationally verified. It's validation, for Newton, could not be found in the logic of God's plan but in the discovery of nature's law. Newton perceived God in the order of the universe expressed in uniform laws (for example in the design of the eye, the arrangement of the day and night, the proportions of the land and sea, the unalterable laws of motion, the movements of the planets). The Book of Nature was a more trustworthy basis for belief than was the Book of the Bible. God's benevolence could be found in the design of the universe which existed for the convenience of human beings.

Newton was one of a group called the "Puritan Scientists" in the Royal Society of England. They saw no incompatibility between reason and faith although they felt that dogma based on revelation was divisive and erroneous. A more reliable basis for universal belief could be found in nature - a record open to every person. Nature was a law abiding machine which could be seen by all. Faith was reasonable. The image of God in humans was this ability to reason and the think mathematically.

The church was suspicious of this substitute of reason for experience. It felt that Deism based on natural, rather than revealed, theology was a major departure from classical Christian faith. A personal God was ignored and providence became a process applied to nature rather than to individuals.

BLAISE PASCAL (1623-1662)

-a case study in the integration of science and religion-

Blaise Pascal was a French scientist and religious writer who was a contemporary of Descartes and whose career spanned the last part of Galileo's and the early part of Newton's life.

Although not university based, Pascal was a vigorous supporter and practitioner of the new science of experimentation and mathematical expression. In spite of the fact that he never went to school (his father taught him), he was a genius and by the age of 12 had derived the first 32 of Euclid's geometric propositions by tracing patterns in the tile floor of his home. He is credited with formulas for studying cones, with measuring barometric pressure of enclosed gases and of the atmosphere, with inventing a calculating machine, with the existence of vacuums in nature, with constructing the first wristwatch and with designing the first system of public transportation!

He was a faithful Roman Catholic. Up to the time of his father's illness in 1646 his participation was nominal and he substituted conventional respectability for inward experience. At this time he met some Jansenists from St. Cyran's monastery (named after Cornelius Jansen, author of Augustinus - an anti-Jesuit call for church reformation based on scripture, experience and piety). Thereafter, he questioned whether certainty or faith could be based on the use of reason.

From 1646-54 he remained active scientifically but troubled epistemologically. He became ill from overwork and worry. He wrote: "The year of our Lord, 1654, Monday, 23 November from about half past ten in the evening until about twelve at night - fire! God of Abraham, God of Issac, God of Jacob, not the God of philosophers and scholars. Certainty, joy, peace. God of Jesus Christ. Tears of joy. I had parted from Him. Let me never be separated from Him. Surrender to Jesus Christ". Pascal wrote out these words and sewed them into every coat he owned so he could remind himself of that experience at all times.

He began to critique scientific and mathematical reasoning. He felt that certainty was not possible of three "deceiving powers" which affected the reasoning process. Augments an Augustinian understanding of a fallen humanity yet feels that rigorous scientific method can supercede the problems. Also, affirms our humble dependence on revelation in matters of religion. Called for reason grounded in personal existence; discourse and intuition as fundamental methods of knowing; and a humble acceptance of being able to know something, but not everything, about God. "The heart has reasons which the mind knows not of".

DAVID HUME (1711-1776)

(a case study in the integration of science and religion)

British philosopher, historian, economist and essayist who was born toward the end of Newton's life and who lived through the optimistic years of the Newtonian world view.

Became known (along with Berkeley and Locke) as a "skeptic" in epistemology, i.e. what can we know and how can we know it. This first came to scrutiny with his A Treatise on Human Nature (1739) in which he claimed we can know little or nothing about the essence of human beings (a position he was to take with regard to ALL knowledge in his 1748 book Philosophical Essays Concerning Human Understanding). Accusations of heresy and atheism based on his writing caused him not to get appointed to the chair in moral philosophy at Edinburgh. Because of these rumors he was also denied a professorship at Glasgow in 1751.

After being appointed librarian at Edinburgh, he wrote a History of England which, along with other writings, made him famous. In 1762 James Boswell called him the 'greatest writer in England' and Rome put his books on the Index in 1761. He brought Rousseau to England to escape persecution in France after returning from public service. He died in Edinburgh in 1776. Adam Smith added these words to his autobiography (The Life of David Hume Written by Himself), he approached 'as nearly to the idea of a perfectly wise and virtuous man as perhaps the nature of human frailty will permit'.

Contributions: Challenged the Newtonian conclusions regarding universal mechanical laws of causation; challenged the notion that came from Descartes, Leibniz and Spinoza that the mind could grasp the innate ideas on the basis of which the universe was created; challenged the view that humans were above nature and characterized by "rational spirits" which made them akin to God insisting, instead, that they were creatures of sensitive and practical sentiments; challenged belief in God based on natural religion (cf Dialogues Concerning Natural Religion).

Conclusions:

1. Like Locke believed that the only reliable knowledge which humans can have is based on sense impressions.
2. "Ideas" are derived from compounding, etc. impressions.
3. Words have meaning only if they bring to mind objects from which sense impressions may be gathered.
4. All talk about a realm beyond experience is meaningless.
5. "Cause" means precedence and contiguity of objects which are united together in the "imagination" and which are based on "habit". There is no rational justification for assuming a necessary connection.

IMMANUEL KANT (1724-1804)

(a case study in the integration of science and religion)

Immanuel Kant was a German philosopher who was a contemporary of Hume's and who espoused "critical idealism" as a counter to Hume's "agnostic empiricism". His chief concern was epistemology - what do we know and how can we know it. He offered an alternative to the skepticism of the empiricists, insisting, that although the content of the mind was indeed dependent on sense impressions, it yet organized these impressions through native abilities (i.e. the categories of time, space, causality and substance) and, most importantly, there was a universal sense of moral oughtness in every human being which was a clear demonstration, if not proof, of the divine in that it was a reflection of the 'image of God'. This became known as the moral proof for God. Kant felt it was not a product of the mind.

Two famous quotes of Kant: "I believe in the starry heavens without and the moral law within" and "I have given up belief in order that I might have faith".

He was raised in a German pietist family and school at Konisberg. He later attended the university of Konisberg and taught there as a professor all of his life. It is said that he never journeyed farther than 50 miles from his birthplace but read widely in books of travel and, because of his fame, was visited by persons from across Europe.

Contributions: He contrasted "critical" with "dogmatic" philosophy - the latter a term he attributed both to Newtonian and ecclesiastical philosophers; He, like the skeptics before him, questioned whether the mind could come to certain truth by pure thinking and suggested, instead, that there should be an initial survey of the mind's resources and powers; Concluded that the human mind imposes order on experience - it does not passively receive sense impressions; The order of nature is in the mind rather than in nature; Causality (as Hume suggested) is imposed, not inherent; distinguished between scientific or theoretical knowledge and practical or existential knowledge - the former limited to appearances and the latter limited to inward experience.

Religion for Kant: not based on natural theology but based on the universal sense of moral obligation which cannot be threatened or explained away by empiricism. Whereas humans order the world in theoretical reasoning through the 4 categories of the mind, humans experience God through the impulse to behave ethically. The categorical imperatives to adopt rules of conduct that could be universally applied and to treat persons as end, not means - these are evidence for God who we trust by faith.

AUGUSTE COMTE (1798-1857)

(a case study in the integration of science and religion)

French positivist philosopher, gave the basic science of sociology its name, advocated a "religion of humanity".

Comte was a somber, ungrateful, self-centered and egocentric person whose personality was compensated for by a deep and abiding interest in applying scientific principles for the welfare of humanity. He was influenced by Count de Saint-Simon who reacted to the horrors of uncontrolled industrialism by advocating a benevolent industrial feudalism which combined business enterprise with religious idealism toward the end that the industrial revolution might be a blessing rather than a curse.

Comte was among the first to suggest that human society could be studied in a manner similar to nature. He called for a science of society with laws of function and growth.

Like Hume and Kant he espoused an ideal of science grounded in rigorous methodology. What Hume called 'empiricism' and Kant called 'phenomenalism', Comte called 'positivism'. He suggested that human knowledge developed through three stages: the theological or fictitious, the metaphysical or abstract and the scientific or positive. He suggested that society should be studied in terms of the third or scientific stage. He called for getting rid of all traces of the religious and metaphysical and said that the 19th century was the positivistic age. He said the human mind had come to the place where it could do without relying on the action of divine beings or abstract forces. He called for investigating laws of function rather than principles of causation.

He suggested that "sociology" (the scientific study of society) was the highest form of science. He proposed that the discipline should be divided into social statics (the study of social organization and function) and social dynamics (theories of social progress). He was interested in using social statics in order to control social dynamics for the good of all persons.

Although born into a Catholic family, by the time he was 14 years old he "had naturally ceased believing in God". He proposed a "Positivist Philosophy" or "Religion of Humanity" in which God was dethroned and "the great being" put in its place. In a somewhat feudal benevolent fashion, he advocated using the organization of the Catholic church (devoid of its supernaturalism) for social planning. The "priests" of the new positivist religion would be located in Paris and would be secular sociologists. They would guide, interpret, control morality and educate for the development of an ideal social order.

Comte had much influence of applied social science and on religious social liberalism as well as on humanism in general.

CHARLES R. DARWIN (1809-1882)

(a case study in the integration of religion and science)

An English naturalist who was the first to firmly establish the theory of organic evolution through his monumental work, Origin of Species.

Went to Edinburgh to study medicine, then to Cambridge to study theology. Sailed on the H.M.S. "Beagle" as a naturalist for a surveying expedition - became the preparation for his life work. Questioned the fixity of species on the basis of observations of geographically separated and time separated animals. Influenced by Lyell's principle of "uniformity" in his explanation of geological development as opposed to the more religiously tradition view of "catastrophism" - which said that such changes as had occurred were due to great cataclysm's such as the flood.

Upon his return, began to collect facts on the domestication of animals and observed that "selection was the keystone to man's success...But how selection could be applied to organisms living in a state of nature remained for some time a mystery to me". The principle of the "struggle for existence" (as seen in Malthus' Essay on the Principle of Population answered this question for him.

Thus, he provided a scientific explanation for how evolution worked - free from unfounded fancy or miraculous intervention. He succeeded where Lamarck had failed.

Published on November 24, 1859 On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life - all 1,250 copies sold on the first day of publication. Did not include humans but many felt the implications for human evolution was unmistakable. Led to much controversy including the famous debate between T.H. Huxley and Bishop Samuel Wilberforce at Oxford in 1860. Darwin himself was very mild mannered and never engaged in the violent controversies that erupted about his theory. He was pained by criticism. Yet, he decided that the laws that he postulated for plants and animals also applied to humans. He put forth these views in 1871 in his book The Descent of Man, and Selection in Relation to Sex. Noted the resemblance between humans and gorillas.

The most important results of Darwin's work has been that there is no evidence of providential guidance or purposeful design in evolution. Natural selection and fortuitous variations completely explain the phenomena without any need for miraculous intervention. Darwin said, "My theology is a muddle. I cannot look at the universe as the result of blind chance, yet I can see no evidence of beneficent design, or design of any kind, in the details". Darwin also believed morality was the result of evolution and that it was based on social contract. He became an agnostic in his later years and left the church.

ALFRED NORTH WHITEHEAD (1861-1947)

(a case study in the integration of religion and science)

English/American mathematician and philosopher. Taught math at Cambridge. Was dean of science, University of London. Went to Harvard as professor of philosophy in 1924.

Has provided a complete unification of religion and science in his "process philosophy". This is probably the only new systematic metaphysics developed in the 20th century. He attempted to "bring aesthetic, moral and religious interests into relation with those concepts of the world which have their origin in natural science".

He suggested that science cannot avoid metaphysics. Science is more than the reporting of contingencies in a convenient, communicable and functioning fashion. There are always implicit, if not explicit, assumptions about the nature of reality in scientific endeavors. "Metaphysics" is the study of the most general character of events. It must be coherent in that its concepts must be part of a logical, unified system of interrelated ideas. It must also be applicable to and generalizable from immediate experience. The data which metaphysics must consider include both scientific and religious experience.

Whitehead said, "The dogmas of religion are the attempts to formulate in precise terms the truths disclosed in the religious experience of mankind. In exactly the same way the dogmas of physical science are the attempts to formulate in precise terms the truths disclosed in the sense perceptions of mankind". (However, his concept of God is derived less from religious experience and more from the logic of his whole system, e.g. God is primarily understood as the ground of order and novelty in the world).

Basic ideas of process philosophy: (1) time is primary- the world is in a process of becoming; transition and activity are more basic than permanence and substance; reality is composed of interrelated dynamic events not self-sufficient static substances such as essences are atoms. (2) all events are interfused- the world is a network of mutual influences all of which are interdependent; nothing exists except by participation as in the interpenetrating fields of the new physics. (3) reality is an organic process- called the "philosophy of the organism"; all events occur in contexts which effect them; there is unity and interaction without the loss of individuality. (4) each event is self created- every event is a unique synthesis of the influences upon it; each event is free to integrate and appropriate its relationships in its own way.

God is creative persuasion. He is the primordial ground of order. He is the ground of novelty. "Without God there would be nothing new in the world, and no order in the world". God is influenced by events in the world and He acts by being experienced in the world. His activity is akin to persuasion, not compulsion.

GARY R. COLLINS ()
(a case study in the integration of religion and science)

a Christian psychologist, professor at Trinity Evangelical Divinity School, author of The Rebuilding of Psychology: An Integration of Psychology and Christianity.

educated in academic psychology as well as theology, Collins has called for a reexamination of the foundations, the aims, the methods and the direction of psychology.

Beginning with the affirmation that scientists always make presumptions about ultimate reality, i.e. words have a metaphysic, whether they admit it or not, Collins suggests that it is more logical, more research fruitful, more data sensible, and more consistent with other information to build psychology on a religious foundation in accord with the teachings of the Bible than on an agnostic or atheistic foundation.

He proposes that basing psychology on the Bible gives us greater understanding, greater hope and greater openmindedness than we would otherwise have. His two basic premises are: God exists and is the source of all truth and persons who exists are able to know the truth. Derivative truths are that there are two sources of God's truth, one in nature (natural revelation) and the other in the Bible (special revelation). Science is the study of the natural world and theology is the study of the Bible. Both are endeavors engaged in by humans who are able to know the truth.

The ultimate truth of theology supercedes the temporal truth of science. Theology makes known God's nature and work, describes supernatural forces, gives us reason for believing in the dignity of persons and the orderliness of the universe, tells us about human destiny, instructs us regarding God's will and gives us a divine perspective on history. This goes beyond science and gives us a structure into which the findings of science fits.

The working assumptions of psychology on a new foundation are:

1. expanded empiricism - sense experience is one, but only one, way truth comes to man from God; assumes that God exists and has effect on emotions, intellect, past experiences, etc.
2. determinism and free will - humans have the freedom to choose else the biblical witness would be false; they can respond to supernatural influence as well as situational contingencies.
3. Biblical absolutism - all truth is not relative; there are final or absolute truths and admonitions in the Bible which should be sought and obeyed if one would be truly human.
4. modified reductionism - while some parts of human life can be segmented into smaller and smaller units, much of import in life can only be understood as a unit or as a whole.
5. Biblical anthropology - the view of human beings which is derived from the Bible; Humans are physical, emotional, rational, social but also spiritual - created in the image of God and able to respond to Him.

Topic for Historical Paper P584

- Nicolaus Copernicus (1473-1543) - father of modern astronomy, Polish propagator of the heliocentric theory.
- Galilei Galileo (1564-1642) - Italian mathematician and astronomer, tried by the Inquisition for supporting the Copernician theory.
- Sir Issac Newton (1642-1727) - promulgated a view of the world as mechanistic but purposeful- wrote The Principles Newtonian world machine.
- Thomas Aquinas (1225-1274) - construed the Aristotelian synthesis for Christendom- wrote Summa theologia.
- Johannes Kepler (1571-1630) - astronomer- sought harmony through mathematics and observation- wrote Mystery of the Universe- Mathematical relations of revelation of the divine.
- Francis Bacon (1561-1626) - stressed the observational side of science- author of The New Logic collection of facts medieval science- needed new method to discover new truth.
- Rene Descartes (1596-1650) - proposed a dualism of mind and body, man and nature- influenced the establishment of a mechanistic physics- wrote Discourse upon Method (1637).
- Philip Melancthon (1497-1560) - Luther's follower- representative of Protestant Scholasticism- first to use the term "Psychology".
- Auguste Comte (1798-1857) - coined term positivism- initiated science of sociology said society outgrew religion.
- Benedict Spinoza (1632-1677) - 17th century learned Jew of Amsterdam- Gods=order-pantheism-against God as purpose or person- immanent in the process.
- John Locke (1632-1704) - Essay Concerning Human Understanding author of The Reasonableness of Christianity-interested in applying techniques of physical sciences to human nature and society's systematic formulation of empiricism mind "tabularasa".
- Robert Boyle (1627-1691) -originator of the analogy "The universe is like the clock at Straskourg- God is the divine clockmaker"- Deistic

- Thomas Hobbes (1588-1649)- Man an integral part of the natural order- included his mind- materialistic- method introspection- wrote Leviathan (1651)- sensationalist.
- G. W. Leibniz (1646-1716)- optimist-best of all possible worlds- atomist monads.
- Pierre Laplace (1749-1827)- extended the theory of mechanism to account for small irregularities of planetary motion which Newton had said God would do-"I have no need for that hypothesis" (i.e. God).
- J.O. de La Mettrie (1709-1751)- authored Man the Machine psychic life (mind) accounted for by organic charges in the brain and nervous system.
- Mathew Tindal (d. 1733)- authored Christianity as Old as Creation (1730)- Deist.
- Bishop Joseph Butler (1692-1752)- author of Analogy of Religion Natural and Revealed (1736)- natural religion as irrational as revealed religion- both faith.
- David Hume (1711-1776)-authored Dialogues on Natural Religion- a critic and skeptic about natural religion knowledge= sense impressions, radical empiricism.
- Samuel Taylor Coleridge (1772-1834)- suggested feeling and imagination, not rational proof, were the essences of religion- wrote Aids to Reflection.
- William Wordsworth (1770-1850)- Romantic poet- reaffirmed God's immanence against Deism "we murder to dissect"... "I have felt a presence that distrubs me..."
- Philip Jacob Spener (1635-1705)- German pietist- led reaction against Luthran Scholasticism- father of Pietism- against Thomas Hobbes.
- John Wesley (1703-1791)- reaffirmed religion as personal truth and moral commitment.
- Immanuel Kant (1724-1804)- distinguished between science and faith (theoretical and practical knowledge)-suggested categories of the mind- the essence of religion was moral obligation.

- Charles Darwin (1809-1882)- author of Origin of Species (1859) propogator of evolution - Descent of Man (1871) included humans in evolution- challenged fixity of species.
- Charles Lyell (1797-1875)- author of Principles of Geology (1830) beginning of modern geology- argued against "catastrophism"- affirmed "uniformitarianism" creation by natural causation.
- Jean C. de Lamarck (1744-1829)- unlimited organic changes inheritance of acquired characteristics.
- William Paley (1743-1805)- author of Natural theology (1902) a calculated religion based on reason - reward.
- Asa Gray (1810-1888)- Harvard botanist- maintained overall history of nature could be understood in terms of "purpose" dialogued with Darwin- an evangleical.
- A. R. Wallace (1823-1913)- formulated principle of natural selection independent of Darwin- argued for the distinctiveness of humans (mind and language).
- Herbert Spencer (1820-1903)- social (as well as physical) evolution social Darwinism- author of Principle of Psychology (1855) biological view of human nature.
- Thomas N. Huxley (1825-1895)- ethical norms not derivable from evolution against Christianity- in favor of science.
- S. Wilberforce (1805-1873)- defended religion against evolution- asked Huxley whether he traced his descent from an ape on his grandfathers side or his grandmothers.
- Charles Hodge (1797-1878) Princeton theologian- wrote "What is Darwinism?" conservative Protestant major figure in reformed (calvinistic) orthodoxy.
- Henry Ward Beecher (1813-1887) modernist who affirmed evolution and religion.
- Lymann Abbott (1835-1922)- wrote Theology of an Evolutionist (1897)- Congregationalist.
- Friedrick Schleiermacher (1768-1834) father of liberal theology- religion is in awareness of one's dependency- i.e. experience- not in formal beliefs.

- Albrecht Ritschl (1822-1889) - propagator of a "Theology of moral value"- religion is found in ethical action-man's ethical will.
- Friedrich Nietzsche -if evolution is taken seriously traditional values will have to be turned upside down.
- Karl Marx (1818-1883)- dialectical materialism society has outgrown religion.
- Denis Diderot (1713-1784) - edited great French Encyclopedia (1751-1777) popularized all new scientific ideas- scorned mathematics supported Bacon.
- Blaise Pascal (1623-1662) rejected reason as full proof in religion.
- Voltaire (Penne) (1694-1778)- French rationalist- said Jesus would be insulted to be called a Christian- author of Candide which ridiculed Leibniz.
- Baron d'Holbach (1723-1789) - wrote System of Nature (1770) and Common Sense (1772) - attacked Christianity- a skeptic and atheist- contemporary of Hume.
- David Hartley (1705-1757) - founder of associationist psychology- sensation based knowledge- anti-Cartesian- author: Observations on Man, His Frame, His Duty and His Expectations (1749)
- Claude A. Helvetius (1715-1771)- education the determining influence on behavior- optimist.
- Charles Montesquieu (1689-1755)- 18th century political thinker- The Spirit of the Laws (1748) - advocated determinism and social control.
- Gustav Fechner (1801-1887) Pioneer of psychophysics- world is animistic.
- George W. Hegel (1770-1831)- German philosopher- philosophy of history (dialectic), development of the mind- place of spirit in consciousness.