The Creation/Evolution Continuum
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The first page of the "Members Centerfold" section of this issue of RNCSE presents a graphic that I have used in many of my public presentations. So many people have requested copies of the graphic and supporting information that I decided to make it available in RNCSE. Now anyone can make a transparency from page 17, and use it with the information in this article to present some very important information to audiences.

Many -- if not most -- Americans think of the creation and evolution controversy as a dichotomy with "creationists" on one side, and "evolutionists" on the other. This assumption all too often leads to the unfortunate conclusion that because creationists are believers in God, that evolutionists must be atheists. The true situation is much more complicated. I encourage people to reject the creation/evolution dichotomy and recognize the creation/evolution continuum. It is clear that creationism comes in many forms. If a student tells a teacher, "I’m a creationist", the teacher needs to ask, "What kind?"

THE CREATION/EVOLUTION CONTINUUM

Page 17 presents a continuum with creationism at one end and evolution at the other. The strictest creationists are the Flat Earthers.

Flat Earthers -- Members of the Flat Earth Society believe that the shape of the earth is flat because a literal reading of the Bible demands it (Schadewald, 1991). Charles K. Johnson is the head of the International Flat Earth Society, headquartered in Lancaster, CA, and he is very serious about the planet’s shape being as the ancients perceived it: circular and flat, not spherical. The earth is shaped like a coin, not a ball. References in the Bible to the "four corners of the earth" refer to the cardinal directions; more relevant are references to the "circle of the earth", implying a 2-dimensional, flat plane. The International Flat Earth Society has only about 200 members (Schadewald, 1980) and is insignificant in the antievolution movement. However, it represents the most extreme biblical literalist theology: the earth is flat because the Bible says it is flat. Scientific views are of secondary importance.

Geocentrists -- Geocentrists accept that the earth is spherical, but deny that the sun is the center of the solar system. Like flat earthers, they reject virtually all of modern physics and chemistry as well as biology. Geocentrism is a somewhat larger, though still insignificant constituent of modern antievolutionism. At the Bible-Science Association creationism conference in 1985, the plenary session debate was held between two geocentrists and two heliocentrists (Bible-Science Association, 1985). Similarly, as recently as 1985, the secretary of the Creation Research Society was a published geocentrist (Kaufmann, 1985).

Both flat-earth and geocentrist views reflect the perception of the earth held by the ancient Hebrews, that the earth is a flat disk floating on water, and the heavens are held up by a dome (or firmament) with the sun, moon, and stars attached to it (Cartmill, 1998). The waters above the firmament, flowing in through the windows of heaven, were the source of the forty days and nights of rain of Noah’s Flood.
The next group of creationists on the continuum are less strictly literal in their interpretation of the Bible, but they still hold to Special Creationism.

*Young-Earth Creationism* -- The term "Young-Earth Creationism" (YEC) is usually reserved for the followers of Henry Morris, founder and recently-retired president of the Institute for Creation Research (ICR), and arguably the most influential creationist of the late 20th century. Few classical YECs interpret the flat-earth and geocentric passages of the Bible literally, but they reject modern physics, chemistry, and geology concerning the age of the earth, and they deny biological descent with modification. In their view, the earth is from 6 to 10 thousand years old.

Henry Morris defined antievolutionism in its modern form. In 1961, he and John C Whitcomb published The Genesis Flood, a seminal work that claimed to provide the scientific rationale for Young Earth Creationism (Whitcomb and Morris, 1961). As the title suggests, the authors accept Genesis literally, including not only the special, separate creation of humans and all other species, but also the historicity of
Noah’s Flood. The Genesis Flood was the first significant 20th century effort to present a scientific rationale for special creationism. "Creation Science" was fleshed out by subsequent books and pamphlets by Morris and those inspired by him.

The Institute for Creation Research (ICR) remains the flagship creationist institution to which all other YEC organizations look. Most literature promoting "creation science" originates with the ICR, and promotes YEC. The National Center for Science Education provides information refuting the scientific claims of creation science. Criticisms of creation science from a pedagogical standpoint can be obtained from the National Association of Biology Teachers and the National Science Teachers Association. The US Supreme Court has declared the teaching of creation science to be an illegal advancement of sectarian religion (Edwards v. Aguillard). More information on YEC can be found in Scott, 1997, Scott, 1994, and Scott and Cole, 1985.

**Old Earth Creationism** (OEC) -- That the earth is ancient was well-established in science by the mid-1800’s, and was not considered a radical idea in either the Church of England or the Catholic Church (Eiseley, 1958). From the mid-1700’s on, the theology of Special Creationism has been harmonized with scientific data and theory showing that the earth was ancient.

Theologically, the most critical element of Special Creationism is God’s personal involvement in Creation; precise details of how God created are considered secondary. The present may indeed be different from the past, but OECs see God as an active causal agent of the observed changes.

**Gap Creationism** -- One of the better-known accommodations of religion to science was Gap or Restitution Creationism, which claimed that there was a large temporal gap between Genesis chapter I:1 and chapter I:2 (Young, 1982). Articulated from about the late 18th century on, Gap Creationism assumes a pre-Adamic creation that was destroyed before Genesis I:2, when God recreated the world in six days, and created Adam and Eve. A time gap between two separate creations allows for an accommodation of the proof of the ancient age of the earth with Special Creationism.

**Day-Age Creationism** -- Another attempt to accommodate science to a literal, or mostly literal reading of the Bible, is the Day-Age model, which was more popular than Gap Creationism in the 19th century and the earlier part of this one (Young, 1982). This model accommodates science and religion by rendering each of the six days of creation as long periods of time -- even thousands or millions of years instead of merely 24 hours long. Many literalists have found comfort in what they think is a rough parallel between organic evolution and Genesis, in which plants appear before animals, and human beings appear last.

**Progressive Creationism** (PC) -- Although some modern activist antievolutionists may still hold to Day-Age and Gap views, the view held by the majority of today’s Old Earth Creationists is some form of Progressive Creationism. The PC view blends Special Creationism with a fair amount of modern science. Progressive Creationists such as Dr. Hugh Ross, of Reasons to Believe ministries, have no problems with scientific data concerning the age of the earth, or the long period of time it has taken for the earth to come to its current form. Astronomer Ross, a University of Toronto Ph.D., cites the Big Bang as evidence of the creative power of God. Although modern physical science is accepted, only parts of modern biological science are incorporated into PC.

PCs generally believe that God created "kinds" of animals sequentially; the fossil record is thus an accurate representation of history because different animals and plants appeared at different times rather than having been created all at once. PCs reject the inference that earlier forms are genetically related to later ones; kinds are separate creations: descent with modification does not occur. The definition of kinds is inconsistent, but usually refers to a higher taxonomic level than species. Most PCs accept that God
created creatures containing at least as much genetic variation as a Family (such as Felidae, Canidae, etc) and then considerable "evolution within a kind" occurred. A created cat kind thus would have possessed sufficient genetic variability to differentiate into lions, tigers, leopards, pumas, bobcats, and house cats, through the normal microevolutionary processes of mutation and recombination, natural selection, genetic drift, and speciation. The "basic body plans" of major phyla which appear in the Cambrian "explosion" are seen by most OECs as evidence of Special Creation. In PC, God is seen as acting through natural law (i.e., microevolutionary processes) but also as an active creator.

**Intelligent Design Creationists** (IDC) -- Intelligent Design Creationism is a lineal descendent of William Paley´s Argument from Design (Paley, 1803), which asserted that God’s existence could be proved by examining his works. Paley used an analogy: if one found a watch, it was obvious that such a thing could not have come together by chance; the existence of a watch implies a watchmaker who has designed the watch with a purpose in mind. Similarly, the finding of order, purpose, and design in the world is proof of an omniscient designer.

The vertebrate eye was Paley’s classic example of design in nature, well known to educated people of the 19th century. In IDC, one is less likely to find references to the vertebrate eye and more likely to find DNA structure or cellular complexity held up as "too complex to have evolved by chance." The high school biology supplemental textbook, Of Pandas and People (Davis and Kenyon, 1989), weaves information theory into an exposition of the "linguistics" of the DNA code in an attempt to prove that DNA is too complex to explain by means of natural causes.

In the PC tradition, IDC allows for a fair amount of microevolution, but supporters deny that mutation and natural selection are adequate to explain the evolution of one kind from another, such as chordates from echinoderms, or humans from apes. Major body plans and the origin of life are phenomena supposedly "too complex" to be explained naturally, thus IDC demands a direct role for the "intelligent designer" -- God. There have been calls for IDC to be taught with evolution, much as equal time for creation science and evolution was promoted before the Supreme Court disallowed the advocating of creationism in 1989.

IDCs vary considerably in their attitude towards evolution. Most IDC activists are not scientists, but philosophers or historians. The few biologists among them actually accept a fair amount of evolution. In 1996, Lehigh University biochemist Michael Behe published the most scholarly and scientific IDC book to date, Darwin’s Black Box (Behe, 1996), which offers little comfort to typical antievolutionists. Behe accepts that natural selection produces most of the complex structural adaptations of plants and animals, and even accepts that modern living things descended with modification from common ancestors. In a debate with Brown University biologist Kenneth Miller during the summer of 1995, Behe agreed with Miller’s point that common pseudogenes between apes and chimps is strong support for their having shared a common ancestor (Miller, 1996).

Still, Behe asserts that some biological phenomena can’t be explained through natural processes. He claims that at the level of cell biochemistry there are "irreducibly complex" processes and structures, such as the blood clotting cascade and the rotor motor of a microorganism’s flagellum. Such structures cannot be broken down into individually-functioning component parts, says Behe, and therefore cannot be explained through the incremental activity of natural selection. Therefore they could not have evolved, and because they could not have evolved, they must have been specially created. Behe argues, as did Paley, that complexity is proof that there must be an intelligent designer, but his examples of complexity are biochemical rather than anatomical.
Because Behe is a research scientist with a track record of legitimate publications (although not in evolutionary biology), his book has been reviewed by scientists. (Coyne, 1996; Miller, 1996, reviews may be found at a web site: http://www.world-of-dawkins.com/box/behe.htm) The response of the scientific community has been decidedly tepid. Reviewers were quick to point out flaws in Behe’s reasoning, and factual and conceptual understanding, especially concerning the cumulative nature of natural selection.

The Creation/Evolution Continuum, like most continua, has few sharp boundaries. There is a sharp division between YEC and OEC, but less clear cut separation between the various OEC persuasions. Even though OECs accept most of modern physics, chemistry, and geology, they are not very dissimilar to YECs in their rejection of descent with modification.

**Evolutionary Creationism** (EC) -- Despite its name, evolutionary creationism is actually a type of evolution. Here, God the Creator uses evolution to bring about the universe according to his plan. From a scientific point of view, evolutionary creationism is hardly distinguishable from Theistic evolution, which follows it on the continuum. The differences between EC and Theistic evolution lie not in science, but in theology, with EC being held by more conservative (evangelical) Christians (D. Lamoreaux, p.c).

**Theistic Evolution** (TE) -- Theistic Evolution is the theological view that God creates through evolution. Astronomical, geological and biological evolution are acceptable to TEs. They vary in whether and how much God is allowed to intervene -- some come pretty close to Deists. Other TEs see God as intervening at critical intervals during the history of life (especially in the origin of humans), and they in turn come closer to PCs. In one form or another, TE is the view of creation taught at mainline Protestant seminaries, and it is the official position of the Catholic church. In 1996, Pope John Paul II reiterated the Catholic TE position, in which God created, evolution happened, humans may indeed be descended from more primitive forms, but the hand of God was needed for the creation of the human soul. (John Paul II, 1996).

**Materialist Evolutionism** (ME) -- Theistic Evolution is followed on the continuum by a nonreligious view, Materialist Evolutionism. It is important to distinguish two ways that "materialism" is used. One is in science, which is described as a "materialist" enterprise, focusing on matter and energy and their interactions. Modern science operates under a rule of methodological materialism that limits it to attempting to explain the natural world using natural -- matter and energy -- causes. Science in and of itself is neutral to religion: by definition, it lacks the ability to hold constant supernatural forces. It is neither antireligious nor pro-religious: it is neutral because supernatural forces are outside of what it can consider as causation. MEs go beyond the methodological materialism of science to propose that the laws of nature are all there is: the supernatural does not exist. This is a form of philosophical materialism (naturalism or scientism), which is distinct from the practical rules of how to do science.

Antievolutionists such as Phillip Johnson criticize evolution and science in general as being philosophically materialistic (Johnson, 1995). This is a logical error. It is very likely the case that all philosophical materialists are also methodological materialists. The converse is not necessarily true: that all methodological materialists are also philosophical materialists. It may be the case, but this would have to be determined empirically, it does not follow logically. In fact, such a claim is empirically falsified, as there are many scientists who use methodological materialism in their work, but who are theists and therefore not philosophical materialists. In addition to many living scientists, Gregor Mendel is a classic case of a scientist who was a methodological materialist but not a philosophical one.

Teachers of both high school and college have told me that many students come into a class with the attitude that evolution is somehow unacceptable for a religious person. Such students are reluctant to learn about evolution. One way to assuage their concerns is to use the "creation/evolution continuum" to illustrate the wide range of opinion within Christianity towards evolution, which helps religious students...
understand that there are many options available to them as people of faith. Most students will recognize themselves somewhere on the continuum, whether believers or nonbelievers; it makes for an engaging lecture. It is perfectly legal for teachers to describe religious views in a classroom; it is only unconstitutional for teachers to advocate religious ideas in the classroom. I have also presented the "creation/evolution continuum" in public lectures to general audiences, and they have also found it of interest. Many people are unaware that there is far more variation among creationists as to how things came to be than there is among evolutionists!

Source: National Center for Science Education
http://www.natcenscied.org/resources/articles/1593_the_creationevolution_continu_12_7_2000.asp
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CREATION

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Young Earth Creationists
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Progressive Creationism
Intelligent Design Creationism
Evolutionary Creationists
Theistic Evolutionists
Materialist Evolutionists

EVOLUTION
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