H.J. Birx ed. Encyclopedia of Anthropology, 2. SAGE Publications 2006

faculties were located in brain "organs" on the brain's surface, which could be felt if you ran your hands over the person's head. It was believed that brain organs grew larger as they were used, so those who used the organs a lot would create bumps on their skulls.

Phrenology came from the theories of Franz Joseph Gall, a Viennese physician in the late 1700s and early 1800s. He stated that the size of an organ in the brain was a measure of its power and that the development of various organs dictated the shape of the brain. Therefore, the surface of the skull was an accurate index to a person's psychological aptitudes and tendencies. From the mid 1790s to approximately 1810, Gall and his disciple, J.G. Spurzheim, were the only practitioners of the science. The English-speaking world learned about phrenology from a review condemning it in the prestigious *Edinburgh Review*. Many people became interested. A phrenological society was founded in 1820 in Edinburgh. Many others followed throughout Britain and America in the next few decades. During the 1830s and 1840s, phrenology was very popular in America.

Phrenology was always controversial, and never widely accepted as an actual science. By the middle of the 19th century, it had been almost totally discredited as a science in Europe, although the idea continued to flourish in America for quite some time. Phrenology was subscribed to by such illustrious people as Ralph Waldo Emerson, Horace Mann, and Thomas Edison. Even as late as 1934, many people still believed in the pseudoscience. Henry C. Lavery and Frank P. White invented a machine, called a psychograph, that did a phrenological reading with a printout. The psychograph was made up of 1,954 parts and measured 32 mental faculties. The owners of one of the machines netted about $200,000 with the device at the 1934 Century of Progress Exposition in Chicago.

Phrenology did have some correct assumptions about the human brain. Such things as intellect, emotions, and perception are located in the brain. Also different parts of the brain are responsible for different functions.

— Pat McCarthy

Creationism Versus Geology

Creationism is the belief that our universe came into being in exactly the way described in the Bible's book of Genesis. This literal interpretation of the Bible's accountings of our beginnings has been embraced by some—but not all—Protestant Christians and Catholics. Many levels of the Catholic Church give Genesis a more allegorical or symbolic meaning, and Pope John Paul II publicly accepted the theory of evolution.

A History of the Debate

Since antiquity, humankind has tried to apply science to the Bible's description of creation, eventually giving rise to the *science of origins* and a *natural theology*, which considered that the marvels revealed by science through nature confirmed religion. In 1748, Count Buffon proposed that the Earth could be millions of years old, an idea that outraged the theological authorities at Sorbonne, who forced him to publicly recant. Buffon went on to define seven geological eras, in accordance with the days in Genesis.

In the first part of 19th century, naturalists such as Louis Agassiz, Georges Cuvier, and Alcide d'Orbigny supported the idea of a series of successive extinctions and creations. Their *catastrophism* was used to integrate and reconcile the scientific discoveries of geology with the Bible's doctrine. But the Archbishop Ussher had established that the date of creation was 4004 BC, and the new data demonstrated that the Earth was many years older. Today's creationists consider the Great Flood responsible for all fossils, but early catastrophists did not.

By the middle of the 19th century, James Hutton's *actualism* and Charles Lyell's *uniformitarism* began to overtake catastrophism. Geology was an emerging science, and its paradigm questioned some of the constructs of creationism: the Great Flood, the direct creation of all animals by God, and the creation of human beings from clay. Lyell, particularly, presented theoretical foundations that set the stage for Charles Darwin's *natural selection* in the transformation of species and the theory of evolution. Only a few fossils were known in Darwin's time, and scientists could not find support to corroborate the evolutionary process using palaeontology until Simpson demonstrated the value of fossils to document the *synthesis theory* of evolution.

Acceptance of Darwin's theory of evolution has been gradual. At the end of the 19th century, some renowned scientists remained opposed to the theory. Some, such as the geologist James D. Dana, defended evolutionism but supported the specific creation of human beings and the comparison between day and geological era. Others, including Arnold Guyot, a naturalist from Princeton, and the Canadian geologist John W. Dawson not only compared day and era, but attempted to harmonize science and the Bible by invoking a singular creation for matter, life, and humankind.

In 1909, C. I. Scofield published a version of the Bible that enforced Thomas Chalmers's idea that there were long intervals of time between the events described in verse 1 and verse 2 in the first chapter of Genesis. This explanation allowed the time required by earth sciences between the first destruction and a new creation. At the same time, geologist and Protestant minister George F. Wright began a text on Christian opinions about evolution. In the 1920s, evolutionists in some parts of the United States were persecuted, and various professors resigned.

In 1923, a geology textbook by George McCready Price gave the Great Flood credit for producing all the rocks and fossils at the same time through catastrophe. Price, a Seventh-Day Adventist, also wrote other books disputing the theory of evolution, the first time that a creationist took on evolution through a scientific—rather than Biblical—approach. Today, we consider Price a pioneer who inspired the scientific creationists of the 1960s, especially Henry M. Morris.

The Debate in the United States

In the United States before 1925, 37 states approved laws that prohibited teaching evolution in public schools. In 1925, professor John Thomas Scopes went on trial in Tennessee for teaching the theory of evolution. In a case that would become known as the Monkey Trial, the conviction carried so light a sentence that creationists could claim no victory. Still, writers of school textbooks feared an antievolution backlash, and the theory of evolution nearly disappeared from texts. It took 40 years for the antievolution laws to be declared unconstitutional and repealed.

Particularly in the U.S., creationists organized and formed societies to fight evolutionary theory. These included the Religion and Science Association (1935), the Society for the Study of Creation, the Deluge, and Related Science (1938), and the American Scientific Affiliation (1948). At the latter's convention in 1953, Henry M. Morris, a professor of hydraulic engineering, gave a speech on "Biblical Evidence of a Recent Creation and a Universal Flood" based on Price's geology of the Great Flood. In 1957, the theologist John C. Whitcomb wrote *The Genesis Flood.* In 1958, the Seventh-Day Adventists created the Geoscience Research Institute in Loma Linda, California to study the scientific evidence about our origins. In 1961, Whitcomb, in collaboration with Morris, published a well-received work of scientific creationism. In 1963, creastionists formed the Creation Research Society in Michigan based on a committee of scientific experts and nonscientific members (such as Whitcomb). This society's members believed that the Bible was the written word of God and historically and scientifically true.

In 1970 in San Diego, California, the Creation-Science Research Center directed by Morris and Gish was formed to spread the idea that evolutionism and creationism are two concurrent scientific hypotheses. In his book *Evolution, the Fossils Say No!* (1972), Gish attempted to discredit the value of fossils in what amounted to an attack on paleontology. In Whitcomb's 1972 book *The Early Earth,* he revives the idea of long time intervals for the days described in Genesis. This time-interval approach led to the 1981 laws passed in Arkansas and Louisiana that granted equal treatment in the schools for the theory of evolution and the science of creationism. When many American scientists protested the enactment of similar laws in other states, these laws were rescinded in 1987.

In the U.S. today, polls show that half the population believes that God created human beings in our current form less than 10,000 years ago. In 1996, members of the education committee of the State of New Mexico eliminated all references to evolution in the *State's Standards for Science Education* in public schools. Creationists continue to publish antievolutionary works: The Geoscience Research Institute alone publishes *Origins,* a magazine about the history of the Earth; *Geoscience Reports,* a newsletter for the general public; and *Ciencia de los orígenes* for the Hispanic community. The Creation Research Society, still directed by Morris and Gish, publishes the magazine *CRS Quarterly* and the bimonthly newsletter *Creation Matters.*

The Debate in Australia

In Australia, in 1989 Rhondda E. Jones warned about the dangers of creationism in teaching science and proposed that scientific creationism was one of the best illustrations of pseudoscience. In 1994, the director of the Department of Geology at the University of Newcastle, R. Plimer, wrote *Telling Lies for God, Reason vs. Creationism* and soon filed suit against a creationist who claimed to have found Noah's Ark through scientific analysis; Plimer's case was rejected.

The Debate in Europe

In Europe, the Catholic sect *Cercle Scientifique et Historique* was created to spread the word of the diluvian leader, Fernand Crombette. One of the sect's most outspoken members, French sedimentologist Guy Berthault, in 1988 discredited evolution by denying the main principle of the superposition of strata. In 1991, another active leader, Dominique Tassot, concluded that evolutionary prehistory is illogical, irrational, and a permanent fraud. Furthermore, Tassot claimed that only the Bible's trilogy of the Creation, the Descent, and the Flood is simple, complete, and factual. In Spain, creationists may remain Catholic but sympathize with scientific creationists. Professor of geology Indalecio Quintero published *Adam and Eve Were Alive* in 1986 in an attempt to integrate scientific data and the Bible. In 1996, Alejandro Sanvisens Herreros, a Catholic professor, published *The Whole Truth About Evolution* through the University Publishing House of Barcelona. It attacks evolution using the same arguments as Morris and Gish. The creationist publishing house founded in Tarrasa (Barcelona) and directed by Santiago Escuain has translated and published many articles and books written by U.S. creationists.

The Geological and Paleontological Perspective

Historically, data from geology and paleontology have not well served creationists. Scientists such as Kitcher, McGowan, Berra, and Birx, as well as geologists and paleontologists such as Newell, Gould, Gastaldo and Tanner, Eldredge, and Molina have defended evolutionism. Recent data indicate that the Earth is thousands of millions of years old, and that, over this time, slow geological processes—almost imperceptible in the short length of a human life—have molded the Earth's surface, giving rise to the current geological and geographical configurations. Paleontology has demonstrated that, throughout these millions of years, life has evolved from the smallest and most simple cells, in the Precambrian, to the most complex and intelligent animals. In addition to the biological data, fossils are the best evidence of evolution and its mechanisms.

— *Eustoquio Molina*

See also **Big Bang Theory; Darwin, Charles; Evolution, Arc of; Evolution, Disbelief in; Fossils; Monkey Trial (1925)**

Further Readings

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Creationism, Beliefs in

Creationism is a surprisingly complex and diverse position that has had resurgence in the first part of the 21st century. Initially a stance taken in response to the development of evolutionary sciences in the 19th century, Creationism is usually based on three fundamental positions:

- A superior being created all out of nothing.
- The doctrine of the essentialism of species.
- A divine being creates individual human souls.

While creationism is most often cited as a position held by certain Christian groups, there are also a number of non-Christian, Jewish, Islamic, Vedic, and indigenous groups that maintain creationist positions. And, although creationism has often been