Theories of Origins: A Multi- and Interdisciplinary Course for Undergraduates at Wheaton College

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Scientific theories for the creation of the universe, earth, life, diversity of life, and humankind are explored in Theories of Origins, a science course at Wheaton College. Professors representing the sciences and biblical studies guide the class through origins theories and introduce various approaches for relating scientific and biblical accounts of creation. Most students are nonscience majors, so a major course objective is for students to appreciate the sophistication of modern scientific work on origins problems and to understand the evidence leading to paradigms and paradigm shifts. Tensions perceived by students between scientific and biblical accounts of origins are diffused when the purviews of science and theology are properly defined and the cultural-historical contexts of scriptural accounts are considered. Learning is stimulated by a variety of means, such as illustrated lectures, videos, demonstrations, Internet resources, selected reading materials and integrative writing assignments, a museum field trip, and class discussions.

Theories of Origins (IDS/SCI 322) is an upper-division science course for undergraduates at Wheaton College in which students encounter scientific explanations for the origins of the cosmos, earth, life, species, and humankind. The course is team-taught by faculty representing the disciplines of astronomy, geology, chemistry, biology, physical anthropology, and biblical studies. Accordingly, students get exposed to important scientific concepts in each discipline in addition to the sustained consideration of origins from scientific and theological perspectives. Established in 1860, Wheaton College represents the evangelical Christian tradition in undergraduate liberal arts education. Scientific origins theories are controversial, indeed often considered antagonistic to biblical faith for many people in the evangelical subculture. Surveys of students entering the class reveal a range of positions on origins questions, often tracking the results of national polls.

A major course objective is to give students a background for evaluating the merits of scientific and theological claims for origins theories. Mainstream scientific approaches to origins are emphasized in the course, but alternative or "anti-establishment" approaches such as creation science and Intelligent Design are presented because of their influence among Christians. Efforts are made throughout the course to diffuse the warfare metaphor for science-faith issues by framing science and theology as complementary means of discovering truth about origins. This course embodies the educational purpose of Wheaton College to combine faith and learning in order to produce a biblical perspective needed to relate Christian experience to the needs of contemporary society.

Objectives, Outcomes and Assessment

Theories of Origins (hereafter, Origins) is a full-semester, non-lab course in the general education curriculum (4 credit hours) intended to follow completion of a lab course (e.g., general geology, biology, chemistry, or physics). Most students in the course are

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nonscience majors. Origins was conceived and developed by a committee of science faculty in 1994–1995, at a time when the college was revising the undergraduate general education program. The new program, "Essentials of a Christian World View," was designed with the purpose to "introduce men and women to an understanding and appreciation of God, his creation and grace, and to our place of privilege and responsibility in the world." The Christian liberal-arts project of faith and learning integration is embedded in specific goals for all general education curricula. Objectives for Origins reflect the goals that were developed for all science courses in the Nature Cluster of the General Education program. Specific outcomes for students who complete Origins are listed in Table 1.

Student demand for this course has influenced us to raise the class size from 40 to 60 students. There is sufficient interest in the course to justify increasing the cap, probably to 75 students or more. However, additional students would burden the process of reading and evaluating written assignments and exams and returning them in a timely and formative manner.

Students in the course are given opportunities to learn and be evaluated in different ways. Most lectures are illustrated with computer-generated slide shows and some lectures include demonstrations or specimens that are passed around the class. All slide shows, plus other learning resources, are available to students outside of class on the course web page. Examining fossil evidence for the history of life on earth is facilitated by a class field trip to the Chicago Field Museum of Natural History. Questions are welcomed in class and spontaneous discussion is encouraged. There are two designated discussion sessions, at the beginning and end of the semester, in which all faculty participate as a panel. Students' understanding of scientific content is measured by exams

Table 1. Outcomes for Theories of Origins

1. Mastery of content and method necessary to raising and solving integrative problems characteristic of the scientific approach to origins.
   a. Describe the scientific findings and theories regarding the origin of the cosmos, earth, life, species and humankind.
   b. Understand the basis and function of ways of knowing, e.g., science and theology.
   c. Comprehend the nature of scientific evidence and reasoning in theory development.
   d. Discuss strengths and weakness of various scientific theories of origins.
2. Development of a sense of biblical and philosophical relationship to interpretation of theories of origins.
   a. Evaluate various views of origins held by Christians using appropriate scientific and theological criteria.
   b. Perceive the basis of strengths and weaknesses of integrative models in order to form a rationally satisfying personal approach.
3. Practice the analysis and synthesis of certain topics by written assignments.

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and homework assignments. Students' critical thinking on matters of faith-science integration is assessed by their work on study questions relating lecture and assigned reading material. Course assessment is based upon student evaluations of the course, percentage of correct responses on selected exam questions, and results of an assessment exam administered by the science division for all students in the college (after they have completed their Nature Cluster courses).

Textbook and Supplementary Reading

We are not aware of a single text that treats scientific theories of origins according to the content objectives of our course. Articles were selected for a course reader that is reproduced by the college print shop and sold to students at the college bookstore (Table 2). The bookstore secures permission from publishers for articles in the reader. Through the years we have tried various "trade books" (generally, by evangelical authors and publishers) on faith, science, and origins issues to supplement lecture content and to stimulate class discussions (Table 3, p. 292). *Species of Origins: America's Search for a Creation Story* by Giberson and Yerxa is an excellent summary of various approaches to origins questions with some scientific content and excellent historical and sociological perspectives.

Student Backgrounds

We routinely collect information on the students' educational backgrounds and what they consider influences on their views about origins. In this section, we report results from surveys conducted in 2004, 2006, and 2007, about 150 students. Students were mostly educated in public high schools (66%) and private Christian academies (24%) with fewer students with backgrounds in private secular academies (5%) or home schools (5%). The prerequisite lab-science courses taken by most students are Physical Geology (51%) and Introductory Biology (28%), followed by General Physics (11%) and General Chemistry (11%). We have discovered that students with chemistry and physics as prerequisites are actually majors in those sciences who are taking the course for elective credit.

Table 2. Assigned Readings and Web Resource Links

1. PHILOSOPHICAL REFLECTIONS ON SCIENCE AND THEOLOGY
   - "The Natural Sciences at Wheaton College: Understanding Their Significance in Light of Our Christian Educational Mission." Wheaton College Division of Natural and Social Sciences (2003)
   - Bube, Richard H. "The Relationship between Scientific and Theological Descriptions." *Journal of the American Scientific Affiliation* 38 (3): 154–163 (1986)
   - "American Scientific Affiliation Commission of Creation Statement." (August 2000)
   - Van Till, H., Young, D.A., & Menninga, C. *Science Held Hostage*. Downers Grove: IV Press, pp 16–25 (1988)
2. THEOLOGICAL PERSPECTIVES ON ORIGINS
   - Seely, Paul H. "The First Four Days of Genesis in Concordist Theory and in Biblical Context." *Perspectives on Science and Christian Faith* 49 (2): 85–95 (1995)
   - Walton, John H. "Creation." In: T. D. Alexander and D. Baker, (eds.). *Dictionary of the Old Testament: Pentateuch*. Downers Grove: Intervarsity Press, pp 155–168 (2002)
   - Walton, John H. "Genesis." *NIV Application Commentary*. Grand Rapids: Zondervan, pp 82–105 (2001)
   - *Internet:*
   - Walton, John H. "Genesis and Cosmology." (www.wheaton.edu/physics/conferences03/index.html). Slide show/audio lecture.
   - Lamoureux, Denis. "Beyond the Creation vs. Evolution Debate." (www.ualberta.ca/~dlamoure/beyond.html) Slide show/audio lecture.
3. THE COSMOS
   - Astronomy information compiled by Dr. Wharton
   - *Internet:*
   - "Nick Strobel's Astronomy Notes." (www.astronomynotes.com)
   - "Cosmology 101." (NASA WMAP site) (map.gsfc.nasa.gov/html/web_site.html)
4. THE EARTH: ORIGIN AND HISTORY
   - Walton, John H. "Extent of the Flood." In: *Chronological and Background Charts of the Old Testament*. Grand Rapids, MI: Zondervan, pp 100–101 (1994)
   - Walton, John H. "Flood." In: T. D. Alexander and D. Baker, (eds). *Dictionary of the Old Testament: Pentateuch*, Downers Grove: Intervarsity Press, pp 315–326 (2002)
   - Young, D.A. "The Discovery of Terrestrial History." In: Van Till, H.J., Snow, R.E., Stek, J.H. and Young, D.A. *Portraits of Creation: Biblical and Scientific Perspectives on the World's Formation*. Grand Rapids: Eerdmans, pp 26–81 (1990)
   - Brand, Leonard A. "Catastrophic Theory of Earth History: General Principles." In: *Faith, Reason, and Earth History*. Berrien Springs: Andrews Univ. Press, pp 267–283 (1997)
   - Morris, Henry M. "Uniformitarianism or Catastrophism?" In: *Scientific Creationism*, 2nd Ed. El Cajon, CA: Master Books, pp 95–130 (1985)
   - *Internet:*
   - Wiens, Roger. "Radiometric Dating: A Christian Perspective." (www.asa3.org/ASA/resources/Wiens.html)

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Upon entering the class, students are asked to rank influences on their personal views of origins (Table 4, p. 293). Personal study was ranked as the primary influence for 37% of the class. Bible/Theology or prerequisite science courses at Wheaton College were more typically of secondary influence, even though the topic of origins is given some consideration in those courses. High school science courses were considered of least influence. Surprisingly, students showed a slight tendency to rank lower the influence of their church experience (preaching and Sunday school). Student responses to questions on origins showed greater degree of acceptance of evolution than respondents in national polls by the Gallup Organization. Only 29% of the students agreed that "God created people in their present form about 10,000 years ago," in contrast to 44–47% of Americans in recent years. The statement, "evolution occurred, guided by God," was affirmed by 66% of the students, in contrast to the affirmative response of 35–40% in national polls. Students discover that results of such poll questions are difficult to interpret because the questions are often poorly written or open to various interpretations by the respondent.

Introductory Lectures: Philosophical and Theological Foundations

The first three class periods are devoted to providing the students with philosophical and theological foundations for approaching questions of origins. From the very beginning we stress that the course is designed to familiarize students with scientific theories of origins that are widely accepted by the contemporary scientific community. This

Table 2. Assigned Readings and Web Resource Links (continued)

5. ORIGIN OF LIFE
   - Deamer, David W. and Gail R. Feischaker. *Origins of Life: The Central Concepts*. Boston: Jones and Bartlett, pp 3–4, 133–136, 147–148, 337–340 (1994)
   - Zubay, Geoffrey. *Origins of Life on the Earth and in the Cosmos*, 2nd Ed. San Diego: Academic Press, pp 85–105, 182–192 (2000)
   - Behe, Michael J. *Darwin's Black Box: The Biochemical Challenge to Evolution*. New York: The Free Press, pp 238–243 (1996)
   - Dickerson, R.E. "The Game of Science: Reflections after Arguing with some Rather Overwrought People." *Perspectives on Science & Christian Faith* 44: 137–138 (1992)
   - Ross, Hugh. "Earth: The Place for Life." In: *The Creator and the Cosmos*. Colorado Springs: NavPress, pp 131–145 (1995)

6. ORIGIN OF SPECIES AND DIVERSITY OF LIFE
   - Wicander, R. and J.S. Monroe. "Evolution." (Ch. 5) in *Historical Geology: Evolution of the Earth and Life Through Time*, 2nd Ed. St. Paul: West Publ. Co. pp 100–129 (2000)
   - *Internet:*
   - Miller, Keith. "Taxonomy, Transitional Forms, and the Fossil Record." (www.asa3.org/ASA/resources/Miller.html)

7. ORIGINS DEBATE IN PUBLIC EDUCATION
   - Scott, Eugenie C., and Branch, Glenn. "Evolution: what's wrong with 'teaching the controversy.'" *Trends in Ecology and Evolution* 18: 449–502 (2003)
   - Letters in response by Langen, Meyer, and reply by Scott and Branch. *Trends in Ecology and Evolution* 19: 449–502 (2004)
   - Three opinions on ID and education in *Chicago Tribune*, November 27, 2005

8. ORIGIN OF HUMANKIND
   - Wicander, R. and J.S. Monroe. "Evolution of the Primates and Humans." (Ch. 19) in *Historical Geology: Evolution of the Earth and Life Through Time*, 2nd Ed. St. Paul: West Publ. Co. pp 510–527 (2000)
   - Young, Davis A. "The Antiquity and Unity of the Human Race Revisited." *Christian Scholars Review* 24 (4): 380–396 (1995)
   - Arnold, Dean E. "How do Scientific Views on Human Origins relate to the Bible?" In Dorothy F. Chappell and E. David Cook, eds. *Not Just Science: Questions Where Christian Faith and Natural Science Intersect*. (2005)

Table 3. Books Covering Faith-Science and Origins Issues

1. Karl W. Giberson and Donald A. Yerxa, *Species of Origins: America's Search for a Creation Story* (Rowman & Littlefield, 2002), 272 p.
2. Robert B. Fischer, *God Did It, But How?* 2nd Ed. (ASA Press, 1997), 121 p.
3. J. P. Moreland & John Mark Reynolds, (Eds.), *Three Views on Creation and Evolution* (Zondervan, 1999), 296 p.
4. C. John Collins, *Science & Faith: Friends or Foes?* (Crossway Books, 2003), 448 p.
5. Hugh Ross, *Creation and Time* (NavPress, 1994), 187 p.
6. Richard Bube, *Putting It All Together* (University Press of America, 1994), 224 p.

Notes: Book 1 is currently used in the course. Books 2–6 were used various years between 1996 and 2005.

clarification is important because some students come expecting a blow-by-blow comparison of "Christian" vs. "secular" theories of origins. Yet, in a Christian liberal arts setting, the faculty and students are free to explore relationships between faith and science and come to a more informed understanding of what we can learn about origins from nature and Scripture.

In the first class period, students watch the television documentary, "What about God?" from the 2001 PBS network series "Evolution." The program features Wheaton College students who share their personal experiences reconciling the theory of evolution with their evangelical Christian faith. Students in the class can see that their questions and intellectual struggles on origins issues are not unusual and that exploring them can be a meaningful experience.

The second class period is presented by a scientist on the teaching team. Basic tools of *doing* science and theology are compared. The illusive scientific method is discussed and concepts of laws, hypotheses, models, and theories are defined. Using Robert Fischer's scheme in *God Did it, But How?* science and biblical theology are cast as means of organizing and interpreting systematized knowledge of what is discovered in nature and revealed in Holy Scripture, respectively. Other topics introduced in this lecture (but not covered exhaustively) include methodological vs. philosophical naturalism, miracles and natural laws, and chance and design.

Richard Bube and Ian Barbour, among others, have identified patterns for relating scientific and theological descriptions, or put more simply, patterns for relating claims of science and faith. Some would hold either theology or science in the position of authority. Others would keep theology and science compartmentalized or independent of one another. Still others would strive for complementarity between theology and science. Students are asked to keep these patterns in mind as they explore different approaches to origins questions. As a guest lecturer one year, Denis Lamoureux (St. Joseph's College, University of Alberta) recounted his personal journey thorough the various positions on the "creation-evolution continuum." His lecture has been available to subsequent classes on the Internet (see Table 2, p. 291). Students are asked to apply Richard Bube's categories for relating science and theology to the positions described by Dr. Lamoureux, and then determine which category fits their personal approach to questions of origins.

Having introduced the framework for the discussion of origins, in the next class period our biblical scholar (J. Walton) considers the Genesis creation account. The message to students is that we are not just starting with science and then going back to the text in order to bring it into conformity with scientific investigation. Instead we communicate very forthrightly the need to understand the biblical account in its context against the cultural environment of the ancient Near East and on its own terms. Many students are concerned that the Bible be interpreted "literally" and while that word can be understood in a multitude of ways, we affirm the importance of reading the biblical text as its author intended and as its audience would have heard it. It is thus made clear that the Bible is not intended as a scientific text, and we demonstrate that, on many levels, God's revelation did not offer any new scientific perspectives, but communicated to the ancients within their conceptual world. We then proceed to introduce the concept that many of the ways we moderns think about the world, nature, and origins did not apply to the ancient world. As an example, for them existence was not defined by having material properties, but by having a function in an ordered system. This is demonstrated from the Bible as well as from the ancient Near Eastern literature. This being the case, we find that creation is not an act of physical manufacture, but of assigning function. Consequently the seven days, understood "literally," are concerned not with material origins, but with functional origins. By this interpretation, the Genesis week has nothing to do with the material age of the cosmos.

Even if students are reluctant to consider new ways to approach the issues, we succeed in communicating to them that (1) the account in Genesis One may not be as transparent to them as they may have thought and (2) they become aware that they have to recognize how easy it is to impose our worldview on the biblical text and, in the process, risk distorting its meaning.

Table 4. Relative Significance of Influences for Views on Origins

	Most 1	2	% 3	4	Least 5
1. My own reading …	30	20	19	17	14
2. My church (preaching and Sunday school) …	18	16	18	18	29
3. Science classes at Wheaton College …	21	25	15	15	18
4. Bible/Theology classes at Wheaton College …	19	26	20	20	9
5. High school science classes …	13	18	23	23	25

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In their final question set, students are asked to evaluate each [Origins] position and identify one that conforms to their view … [Their responses showed] marked shifts in positions over the course of the semester.

Origin of the Universe

The cosmology segment, presented in five class periods by our physicist (W. Wharton), begins with consideration of the enormous expanse of the universe. As we look out to different distances in space, we see slices of the Universe at each time period back to the Big Bang. We show the Moody Institute video, "The Milky Way & Beyond." Next, the Big Bang model is presented with a summary and evaluation of supporting evidence. Techniques to measure distance are presented, that is, stellar parallax and the inverse square law using so-called "standard candles." Evidence for a dominance of dark matter and dark energy in our universe is briefly summarized.

One lecture is given on stars, their history and general characteristics, since most of the elements in living organisms were generated in stars. Explaining the historical process of paradigm shift to Big Bang cosmology from a timeless, static universe model, provides a good opportunity to discuss how scientists deal with anomalies within their existing paradigm. We also discuss a few earlier problems with Big Bang cosmology, which were resolved with additional data. The cosmology segment is framed in the context of the Anthropic Principle, as directed to the characteristics of the universe as a whole. The concept of Earth as "Privileged Planet" is also discussed as another attempt to see evidence of design in nature (The Discovery Institute video of the same name is shown). Students are evaluated with an hour exam and completion of a quantitative assignment covering Hubble expansion.

Earth History

Since the origin of the earth is described in the preceding cosmology segment, the geology segment (S. Moshier) focuses on how geologists interpret Earth history after it formed. The first presentation, during half of a class period (and after the cosmology exam), includes case studies of radiometric dating of rocks and minerals. Assumptions concerning the stability of decay constants over time, initial isotope ratios, and processes that can effect resultant dates, as well as tests for the assumptions are explained.

In the following class period, our biblical scholar explores the flood account in Genesis, because of its influence in pre-modern understanding of Earth history and its importance in contemporary creation science. As in the study of Genesis One, we stress the practice of reading the text as an ancient reader. For the flood account, this primarily involves a recognition of how people in the ancient world understood cosmic geography. We point out some of the significant obstacles to a global flood interpretation and identify other options, including a "universal" flood (the known world), a "regional" flood (e.g., Tigris-Euphrates Basin), or a "local" flood. By introducing a greater variety of options, we reduce the tendency to caricature extreme positions as if they were the only options.

Three more class periods are devoted to Earth history. Basic principles used to interpret rocks are explained by reviewing the history of modern geology; especially its beginnings in the late eighteenth century to the middle of the nineteenth century. This was a period when the prevailing view of geology shifted from castastrophism to uniformitarianism. Geologists were confronted with emerging evidence for the antiquity of creation as they discovered that observable, gradual or episodic processes explained sedimentary rocks and landforms better than a brief, catastrophic deluge. Students are shown field examples of sedimentary rock sequences that can be compared with modern sedimentary environments such as rivers, deltas, swamps, and reefs. To understand the resurgence of Flood Geology in fundamentalist Christianity, students are assigned papers by creationists Henry Morris and Leonard Brand. Student learning is evaluated by their answers to study questions (instead of an exam) that bear upon important facts and concepts in the lectures and assigned readings.

Origin of Life

A pivotal point in the course is reached at the halfway mark when attention is turned to the question of the chemical origin of life. It is generally admitted among authorities, and also emphasized in the first lecture on life's origins, that this is the most difficult to answer of all the origins questions, primarily because of the virtual absence of available data. This segment is presented over five class periods by our chemist (L. Funck). We

begin from a historical vantage by reviewing the long-standing controversy over the question of spontaneous generation, culminating in its death knell through the work of Louis Pasteur. Next the Oparin-Haldane theory is presented, again in a historical context, followed by discussion of the Miller-Urey attempt at synthesis of life's building blocks through simulation of presumed primordial atmospheric conditions. The serious problems of abiogenic synthesis of monomers, polymers, and complex functioning systems are discussed with a continuing emphasis on the increasing degree of complexity required as one moves toward systems that might be considered living. The question of the chemical definition of life is raised early and repeatedly as an important consideration and a source of controversy. Brief attention is given to the currently popular scenario, the RNA World, as the "egg first" hypothesis in contrast to the "chicken first" hypothesis of metabolic cycles involving protein catalysis. We end the lectures with a discussion of the importance of molecular information and its origin as a key issue in origin of life science. This discussion leads into a brief consideration of the contrast between an Intelligent Design approach and that of methodological naturalism. Students are evaluated in this segment with an hour exam.

Origin of Species and Diversity of Life

Our exploration of the origin of the diversity of life, led by our biologist (R. Lewis) for four class periods, begins by surveying the hierarchical pattern of similarity in living organisms that forms the basis for Linnaean classification. While Linnaeus held that kinds were static, Lamarck and Darwin proposed theories of evolution to explain evidence that species change over time. While Lamarck's theory was discredited, Darwin's theory has been generally accepted by scientists as providing an explanation for the hierarchical classification of living organisms. Darwinian evolution is defined in terms of (1) common descent and (2) natural selection, the mechanism proposed by Darwin for evolution.

Since his theory of evolution was found to be incomplete by subsequent discoveries in genetics, the students are introduced to genetics and the Neodarwinian or Modern Synthesis which incorporated genetics. Current formulations of the scientific theory of evolution lean heavily on this synthesis of population genetics, mutations, natural selection, and accumulated change to result in macroevolution. Overall patterns in the fossil record are used to trace hypothetical phylogenetic pathways, and a visit to the Field Museum of Natural History in Chicago helps the students to explore this evidence more fully. The Cambrian explosion, mass extinctions, and patterns of fossil stasis (as explained by punctuated equilibrium) are explored as challenges to the traditional concept of Neodarwinian gradualism, leading to a new, but developing synthesis of evolutionary and developmental biology. Each year we invite Intelligent Design theorist Paul Nelson to spend one session with the class to offer a scientific and philosophical critique of evolutionary theory and advocate the design inference as a fuller explanation for the origin and diversity of life.

By exploring these developments in biology and paleontology, students learn about the nature and process of science while they learn about successive attempts to scientifically explain the origins of species. We also consider how these topics are taught in the public school classroom, emphasizing that science should not prescribe a philosophical or religious worldview. Thus, evolution should be taught as science, not as an attack on religion or an establishment of an atheistic philosophy.

Origin of Humankind

We begin the consideration of human origins with a discussion of the scriptural account, led by our biblical scholar. Again, we are interested in offering a carefully nuanced understanding of the biblical text. This involves investigating what precisely is the interest of the text in presenting human origins. Key points made are that the biblical text, like all ancient Near Eastern texts concerning human origins, is focused on archetypal issues. "Dust" and "rib/side" are not intended as chemical or anatomical references; all people are made of dust and womankind is intimately related to mankind. These archetypal elements do not address the question of historicity, though we also point out that the archetypal representations in the rest of the ancient, Near Eastern world are accomplished through accounts that deal with corporate humanity, whereas Genesis focuses on a single human couple. We offer and consider a complex analysis in which the various aspects of the account are parsed (materials, divine endowment, physical environment, and human actions) and consider different approaches to relating historical, scientific, and biblical information. In this way we strive to deepen the students' awareness of some of the alternatives that exist within the text itself as an ancient document.

Two class periods are devoted to an overview of human origins from the perspective of our anthropologist (D. Arnold). Distinctive biological and cultural characteristics of humans are reviewed in an attempt to answer the question, "What are humans?" Skeletal and cultural artifacts and the geographical ranges of Plio-Pleistocene hominid fossil groups are interpreted. What is known of the earliest history and cultural development of skeletally modern humans (*Homo sapiens sapiens*) is summarized with emphasis on the great leap in human culture evident some 40,000 years before present. The question, "Who was Adam?" is considered in light of Scripture, time, fossil record candidates, and cultural clues. Students' comprehension of the science content in the segments on

biological evolution and human origins is tested in a one-hour exam taken during finals week.

In his provocative article, "The Antiquity and Unity of the Human Race Revisited," Davis Young identified three approaches to the issue of Adam and Eve: (1) recent ancestors (created *de novo* some 10,000 years ago), (2) ancient ancestors (either *de novo* or evolved greater than 100,000 years ago), or (3) recent representatives of evolved *Homo sapiens* some 10,000 to 40,000 years ago. In their final question set, students are asked to evaluate each position and identify one that conforms to their view (Table 5). At the end of the course, a minority of students align themselves with the more fundamentalist view of recent, *de novo* creation. A significant population of students chose the recent representative view, a position in tension with the Wheaton College Statement of Faith affirming Adam and Eve as the historical parents of the entire human race (other humans could not precede them). In 2007 we started polling the class on these positions upon entering the class. We think it is probable that the 2007 response was typical of previous years, showing marked shifts in positions over the course of the semester.

Student Evaluations and Course Assessments

We use a question on the final examination to help us understand how students are responding to the topics of origins, while giving them an opportunity to describe what they have learned. This question asks students to describe a topic or question that has been fairly definitively described or answered by the scientific and theological evidence, and then to pose a question that still remains open because of a lack of evidence or conflicting evidence. The most common topic that is identified as definitively answered (in light of scientific and biblical understanding) is evidence for an old age of the universe and the earth. Students regularly choose human origins and the origin of life as two of the most open questions.

Because the theory of evolution is often avoided in science education at the secondary level, some students are surprised to discover the power of this theory in making sense of patterns and processes in biology. Students exiting the course exhibit levels of skepticism toward scientific explanations of origins ranging from full acceptance to complete rejection (with a majority positioned toward acceptance). Perhaps we should be encouraged that many students maintain an appropriate level of skepticism tempered by an understanding that scientific theories undergo a continual process of modification based upon accumulating evidence.

Students are asked for written evaluations of the course. Many students explicitly state that the course helped them to think about origins issues in a different way and that they better understand the relationships between science and theology as applied to questions of origins. Others appreciate that while their preconceptions may have been challenged by the course, their foundational beliefs are affirmed or strengthened. Some students feel that professors should be more skeptical of mainstream science and present more options for interpreting science in light of Scripture. Students would like more time for open discussion in the class, and many feel that there is too much content for a single course. Some students liked the "revolving door" of the teaching team, while others would have appreciated more consistency in teaching style. Assessments over the years have led to changes in required texts and reading materials, focus and content of the study questions, and adjustments in lecture content.

Conclusions

Over the decade since it was introduced, Theories of Origins has become an effective and popular course at Wheaton College. It is distinctive in its multi- and interdisciplinary content and approach to origins issues, involving faculty from the sciences and biblical studies. Using a variety of lecture styles, Internet and print resources, the teaching team attempts to appeal to students' different learning styles, aptitudes, and interests in order to promote understanding of scientific theories origins and how they relate to biblical accounts of origins. We believe the course has achieved the outcome objectives as assessed by student performance and their course evaluation comments. ✭

Table 5. Positions on Human Origins (Classes 2004–2007 by % of students)

Model	Entering … 2007 n = 56	Exiting Class 2004, 2006, 2007 n = 155
Recent Ancestors– *H. sapiens* created ~10,000 ago	34	9
Ancient Ancestors– 1st *H. sapiens* >100,000 years ago	25	40
Recent Representatives– 1st of *H. sapiens* as image bearers 10,000–40,000 years ago	18	38
No or mixed opinions	23	13