

Ecological Issues in Science and Religion

Institution: Au Sable Institute of Environmental Studies

Instructor: Rolf Bouma

Textbook

Barbour, Ian. *Religion and Science: Historical and Contemporary Issues*. San Francisco: Harper San Francisco, 1997.

Supplementary Textbooks

Jeeves, Malcolm and R.J. Berry. *Science, Life, and Christian Belief*. Grand Rapids, MI: Baker Book House, 1998.

McGrath, Alistair. *Science and Religion: An Introduction*. Malden, MA: Blackwell, 1999.

Richardson, Mark W. and Wesley Wildman, eds. *Religion and Science: History, Method, Dialogue*. New York: Routledge, 1996.

Southgate, Christopher, et al. *God, Humanity, and the Cosmos: A Textbook for Science and Religion*. Harrisburg, PA: Trinity International Press, 1999.

Grading

Grading for the course will be a composite based on the following considerations:

Class participation 10%

Mid-term Examination 25%

Presentations 40%

Final Examination 25%

During the first week of class, each student will choose two topics from the last three weeks of class for presentations. The presentations will involve presenting a 1250-1500 word paper on the topic and leading the class in discussion on the topic. Presentations will comprise 40% of the course grade.

Week One: Science & Theology: A Conversation With a Past

The first week provides an introduction to the interaction between science and religion from the medieval period through the 19th century. This will set the stage for both the methodological discussions of the following week and the contemporary issues of the latter half of the course.

For the medieval period, the course considers theological and philosophical commitments that lie behind medieval concepts of the physical and biological worlds. With respect to the physical world, cosmological assumptions regarding the universe will be explored. In the biological realm, the great chain of being conception will be used to connect the order of creation to God's fundamental character.

The 17th & 18th Century will focus on changes in scientific and theological

methodology, changes that most dramatically appear in the physical sciences. We'll explore the complexity of the Galileo controversy, its philosophical and theological background, and the subtle ways in which church and theology made space for the new learning even as formal ecclesiastical pronouncements seemed to foreclose inquiry. Also examined will be the effect upon theology of deistic and deterministic approaches.

For the 19th Century, the focus will be on the challenge of advances in the geological and biological sciences. We'll examine theories of speciation and extinction in their social and ideological contexts and look at the response of theology. Also examined will be the clash between a romantic and a rational approach to nature, and the dispute over teleology in Lamarckian biology.

July 11 Integrative Session I: Introduction to Northern Michigan Ecology

July 13 Morning Session: Introduction to Issues in Science and Religion

Lecture: Science, Philosophy, and Theology in the Middle Ages: Bestiaries and the Great Chain of Being

Supplemental Readings:

McGrath, Alistair. *Science and Religion: An Introduction*, pp. 1-5.

Wildiers, Max. *The Theologian and His Universe*, Ch. 1-3.

Lovejoy, Arthur O. *The Great Chain of Being*, Ch. 2.

Funkenstein, Amos. *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century*

Afternoon Session: Historical Interactions of Science and Religion

Reading:

Barbour, *Religion and Science*, pp. 3-29

Lecture: Unraveling the Galileo Controversy

Discussion: Science & Religion in the 17th & 18th Centuries

Supplemental Readings:

Jeeves, Malcolm and R.J. Berry, *Science, Life, and Christian Belief*, pp. 22-26.

McGrath, Alistair. *Science and Religion: An Introduction*, pp. 6-20.

Blackwell, Richard J. *Science, Religion, and Authority: Lessons from the Galileo Affair*.

Brooke, John Hedley. "Science and Theology in the Enlightenment" in Richardson and Wildman, *Religion and Science*, pp. 7-27.

Dillenberger, John. *Protestant Thought and Natural Science*

Heilbron, J. *The Sun in the Church: Cathedrals as Solar Observatories*

Lindberg, David C. and Ronald L. Numbers, eds. *God and Nature: Historical Essays on the Encounter between Christianity and Science*

Westfall, Richard S. *Science and Religion in Seventeenth-Century England*

July 15 The 19th Century in Religion and Science

Readings:

Barbour, Religion & Science, pp. 49-74.

Claude Welch, "Dispelling Some Myths About the Split Between Theology and Science in the Nineteenth Century" in Richardson and Wildman, Religion and Science, pp. 29-40.

Andrew Dickson White, History of the Warfare of Science with Theology in Christendom. Introduction and pp. 70-88.

Lecture: From Geology to Biology to Theology: What Were the Questions?

Discussion: Wariness, Openness, and Boundary Setting in the 19th Century

Supplemental Readings:

Jeeves, Malcolm and R.J. Berry, Science, Life, and Christian Belief, pp. 26-32.

McGrath, Alistair. Science and Religion: An Introduction, pp. 21-25.

Cosslett, Tess, ed. Science and Religion in the Nineteenth Century

Draper, John William. History of the Conflict Between Religion and Science

Gregory, Frederick. Nature Lost? Natural Science and the German Theological Traditions of the Nineteenth Century

Livingstone, David N., D.G. Hart and Mark A. Noll. Evangelicals and Science in Historical Perspective.

Moore, James R. The Post-Darwinian Controversies

Week Two: Science and Theology: Methods and Interactions

The second week of the course moves to consideration of the methods and domains of the natural and theological sciences. Students will explore the options for interaction between the fields and examine arguments made by advocates of various positions. Although dialogue will be the model most prominently used in the latter part of the course, students will have an appreciation of other options and their effect upon theology and science conversations.

Students will also investigate the methodologies used in theology and scientific inquiry. Also considered will be several schemes for relating the various fields within science and theology.

July 19 The Relation of Science and Theology

Readings:

Barbour, Religion & Science, pp. 77-105.

Holmes Rolston, III, "Science, Religion, and the Future" in Richardson and Wildman, Religion and Science, pp. 61-82.

Stephen J. Gould, Rocks of Ages: Science and Religion in the Fullness of Life, pp. 47-95.

Lecture: The Relationship Between Religion and Reality

Discussion: Faith in the Laboratory/Observatories in Church: Holding Faith & Scientific Vocation Together

Supplemental Readings:

McGrath, Alistair. *Science and Religion: An Introduction*, pp.28-56.

Annie Dillard, *Pilgrim at Tinker Creek*, "Intricacy."

Jeeves, Malcolm A. and R.J. Berry, *Science, Life, and Christian Belief: A Survey of Contemporary Issues*.

Peacocke, Arthur, ed. *The Sciences and Theology in the Twentieth Century*

Peters, Ted. *Science and Theology in Consonance*, pp. 11-39.

Polkinghorne, John. *Science and Christian Belief*

Rolston, Holmes. *Science and Religion: A Critical Survey*

van Huyssteen, J. Wentzel. *Duet or Duel? Theology and Science in a Postmodern World*.

van Huyssteen, J. Wentzel. *The Shaping of Rationality: Toward Interdisciplinarity in Theology and Science*.

Weaver, John. *Earthshaping, Earthkeeping: A Doctrine of creation*.

Wildman, Wesley. "Similarities and Differences in the Practice of Theology and Science." *CTNS Bulletin* 14(1994):1-14.

July 21 Integrative Session II: Geology of the Great Lakes

Presentation by Ralph Stearley

Trip to the Great Lakes Dunes

July 23 Methodology in Science and Religion

Readings:

Barbour, *Religion & Science*, pp. 106-164.

Wolfhart Pannenberg, *Toward a Theology of Nature*, pp. 1-28.

Lecture: Theology: Queen of the Sciences or Wallflower Extraordinaire?

Discussion: Two Books and Two Domains? Mutuality in Religion and Science

Supplemental Readings:

Jeeves, Malcolm and R.J. Berry, *Science, Life, and Christian Belief*, pp. 49-88.

McGrath, Alistair. *Science and Religion: An Introduction*, pp. 144-176.

Barbour, Ian. *Myths, Models, and Paradigms: A Comparative Study in Science and Religion*

McFague, Sallie. *Metaphorical Theology: Models of God in Religious Language*

Polkinghorne, John. *One World: The Interaction of Science and Theology*

Murphy, Nancey. *Theology in the Age of Scientific Reasoning*.

Murphy, Nancey and George R. Ellis. *On the Moral Nature of the Universe*.

Mid-term Examination

The mid-term examination will be given between the 2nd and 3rd weeks of Summer Session II. It will consist of two parts: 1) a short-answer/identify test given in class at the end of the day on July 21; and 2) a take-home essay. The test will involve identification of names and dates with an indication of their importance to the study of science and religion and definition of terms and concepts relating to the field of science and religion. The take-home essay of approximately 1000 words will require students to reflect upon and integrate into their own view materials covered in the course through the first two weeks. The essay will be due on Monday, July 24 at 4 p.m.

Week Three, Four, and Five: Ecological Issues in Religion and Science

The final three weeks of the course will be devoted to specific discussions that have shown promise in the science – religion dialogue.

July 26 Morning Session: Cosmology and Creation

The argument from design has re-emerged in the twentieth century, with two principle manifestations. The first is linked to big bang cosmology and the statement of the anthropic principle in both its strong and weak forms. The second manifestation is the intelligent design movement, which argues that the existence of irreducible complexity in the biological world militates against a Darwinian theory that relies upon gradual change to account for the emergence of creaturely complexity. The course will examine the points at which divine design can be envisioned, and investigate the explanatory power of intelligent design, particularly as it relates to the issue of ecological diversity.

Readings:

Barbour, Religion and Science, pp. 195-220.

Malcolm Jeeves and R.J. Berry, Science, Life, and Christian Belief, pp. 89-106.

Presentation and Discussion: In the beginning God . . .

Supplemental Readings:

McGrath, Alistair. Science and Religion: An Introduction, pp. 177-185.

Barrow, John D. The Origin of the Universe

Barrow, John D. and Frank J. Tipler. The Anthropic Cosmological Principle.

Davies, Paul. God and the New Physics.

Hawking, Steven. A Brief History of Time.

Morris, Henry M. The Remarkable Birth of Planet Earth.

Peacocke, Arthur. Creation and the World of Science.

Polkinghorne, John. Science and Creation

Polkinghorne, John. The Faith of a Physicist.

Sobosan, Jeffrey G. Romancing the Universe: Theology, Cosmology, and Science.

Weinberg, Steven. The First Three Minutes: A Modern View of the Origin of the Universe.

Afternoon Session: Intelligent Design

Readings:

William Dembski, "Introduction," in *Mere Creation*, pp. 13-30.

Del Ratzsch, "Design, Chance, & Theistic Evolution" in *Mere Creation*, William Dembski, ed. pp. 289-312.

PLUS

One other article from *Mere Creation*.

Presentation & Discussion: Irreducible Complexity and Self-organization

Supplemental Readings:

Behe, Michael. *Darwin's Black Box: The Biochemical Challenge to Evolution*

Dembski, William A., ed. *Mere Creation*.

Dawkins, Richard. *The Blind Watchmaker*.

Gould, Stephen J. *The Panda's Thumb*

July 27 Integrative Session III: Introductions of Non-Native Species

Biology of the Eurasian Milfoil

Field Trip to Manistee Lake

July 31 Morning Session: Natural Theology & Theology of Nature

Natural theology and a theology of nature involve opposite movements: from nature to God in the case of natural theology and from God to nature in a theology of nature.

Natural theology has at various times been praised or pilloried, while a theology of nature has, until recent times, been largely ignored. What is the prospect for natural theology in our day, and what are the questions for a theology of nature?

Readings:

Alistair McGrath, *Science and Religion: An Introduction*. pp. 128-143.

Wolfhart Pannenberg, *Toward a Theology of Nature*, pp. 123-137.

Presentation & Discussion: From God to Nature and Back Again

Supplemental Readings:

Barr, James. *Biblical Faith and Natural Theology*.

Hefner, Philip J. "Can a Theology of Nature Be Coherent With Scientific Cosmology?", *Dialog* 30:267-272 (1991).

Wilkinson, David A. "The Revival of Natural Theology in Contemporary Cosmology," *Science and Christian Belief* 2:95-115 (1990).

Carmody, John. *Ecology and Religion: Toward a New Christian Theology of Nature*.

Toulmin, Stephen E. *The Return of Cosmology: Postmodern Science and the Theology of Nature*.

Plantinga, Alvin C. "The Reformed Objection to Natural Theology." *Christian Scholar's Review* 11:187-198 (1982).

Beverluis, John. "Reforming the 'Reformed' Objection to Natural Theology," *Faith and Philosophy* 12:189-206 (1995).

Gingerich, Owen. "Is There a Role for Natural Theology Today?" IN Science and Theology, pp. 29-48.

Afternoon Session: The Trinity and Ecology

One of the insights of the ecological sciences is the interrelationship of creatures and their environment. Humans, too, can only be understood as situated, related beings. Does this impact our view of God? Does Christian theology have anything special to contribute through its trinitarian, relational view of God?

Reading:

Thomas Finger, "Trinity, Ecology and Panentheism," Christian Scholar's Review 27:74-98 (1997).

Colin E. Gunton, "The Trinity, Natural Theology, and a Theology of Nature," IN The Trinity in a Pluralistic Age, pp. 88-103.

Presentation and Discussion: The Three-in-One and Ecology

Supplemental Readings:

Moltmann, Jürgen. God In Creation, pp. 72-103.

Wilkinson, Loren. "The New Story of Creation: A Trinitarian Perspective," ARC 23:137-152 (1995).

Fox, Matthew. "Creation Mysticism and the Return of a Trinitarian Christianity," IN An Ecology of the Spirit, pp. 61-73.

Edwards, Denis. "An Ecological Theology of the Trinity," CTNS Bulletin 13:10-16 (1993).

August 2 Speciation, Extinction, and Divine Providence

What patterns of speciation and extinction seem to fit the evidence? What does this mean for conceptions of God and divine providence? What scientific and theological ideas hold promise for understanding the process and direction of ecological life? What does the sentience and purposiveness in nature signify?

Readings:

Barbour, Religion and Science, pp. 221-249.

Jeeves, Malcolm and R.J. Berry, Science, Life, and Christian Belief, pp.107-134.

Presentation and Discussion: Is Natural Selection Providential?

Supplemental Readings:

McGrath, Alistair. Science and Religion: An Introduction, pp. 186-192.

Dillard, Annie. Pilgrim at Tinker Creek.

Quammen, David. The Song of the Dodo: Island Biogeography in an Age of Extinction.

Dawkins, Richard. The Blind Watchmaker.

von Ditfurth, Hoimar. The Origins of Life: Evolution as Creation.

MacKay, Donald, Science, Chance, and Providence

McMullin, Ernan, ed. *Evolution and Creation*.
Peacocke, Arthur. *Creation and the World of Science*.
Peacocke, Arthur. *God and the New Biology*.

August 3 Integrative Session IV: Non-Native Species and Alteration of Species
Presentation on Biotechnology
Presentation on Non-Native Species
Field Trip

August 5 Chaos Theory, Quantum Indeterminacy, and Divine Action
A deterministic world seems to be impervious to divine presence except at the beginning and as an ontological ground. Yet two developments of the twentieth century have opened doors to investigation. First, mathematics and the sciences have made tremendous strides in understanding natural processes, including ecological dynamics, by the application of chaos theory. What constitutes chaos, and how does it seemingly blend determinism with randomness? Is its openness merely epistemological, or does chaos present a system truly open to divine influence? What does chaos theory have to say about the nature of relationships within an ecological system? Quantum mechanics also introduces indeterminacy. Is this epistemological or real? Might God be the determiner of indeterminacies?

Readings:

Barbour, Religion and Science, pp. 165-194.
Wildman, Wesley J. and Robert J. Russell, "Reflections on Randomness, Determinism, and Chaos in Nature" in *Chaos and Complexity*, pp. 75-90.

Presentation and Discussion: Does God Play Dice?

Supplemental Readings:

Jeeves, Malcolm and R.J. Berry, *Science, Life, and Christian Belief*, pp. 89-105.
Bartholemew, D.J. *God of Chance*
Crain, Steven D. *Divine Action and Indeterminism: On Models of Divine Action that Exploit the New Physics*.
Gleick, James. *Chaos*.
Gregerson, Neils Henrik. "Providence in an Indeterministic World." *CTNS Bulletin* 14(1994).
Holte, John, ed. *Chaos: The New Science*.
Lewin, Roger. *Life at the Edge of Chaos*.
Mackay, Donald. *Science, Chance, and Providence*.
Polkinghorne, John. "A Note on Chaotic Dynamics." *Science and Christian Belief* 1(1989):126ff.
Russell, Robert J., et al., eds. *Chaos and Complexity*.
Stewart, Ian. *Does God Play Dice?*

August 9 Imago Dei: Anthropology in Science & Religion

In western Christian tradition, rationality marked humans as made in the image of God and set them apart from other creatures. In contemporary times, not only has the notion of “rationality” been challenged, but identifying those characteristic(s) of humanity which comprise the image of God has proved elusive. From an ecological perspective, what is the place and purpose of humanity? How are we to understand the relationship between human culture and nature?

Readings:

Barbour, Religion and Science, pp. 253-280.

Philip Hefner, “The Theology of the Created Co-Creator” in *The Human Factor: Evolution, Culture, & Religion*, pp. 23-51

Presentation and Discussion: What Are People For?

Supplemental Readings:

Jeeves, Malcolm and R.J. Berry, *Science, Life, and Christian Belief*, pp. 135-195.

Berry, Wendell. *What Are People For?*

Hall, Douglas John. *Imaging God: Dominion as Stewardship*.

Thiessen, Gerd. *Biblical Faith: An Evolutionary Approach*.

Wilson, E.O. *On Human Nature*.

Wilson, E.O. *Sociobiology: The New Synthesis*.

Carroll, John E. and Keith Warner. *Ecology and Religion: Scientists Speak*.

August 10 Integrative Session V: Canoe Trip

August 12 Scientific and Theological Eschatology

Christian thought moves from beginning to end, and the two are not the same. What of the end of this age and the beginning of the new? The scientific picture of the end times is still open, depending on whether the universe ultimate keeps expanding or contracts. How does this fit with the theological picture? What does theology have to say about where nature is headed, and does this affect our ecological involvements?

Readings:

William H. Klink, “Ecology and Eschatology: Science and Theological Modeling”, *Zygon* 9(1974):266-283.

Stephen Webb, “Ecology vs the Peaceable Kingdom: Toward a Better Theology of Nature”, *Soundings* 79:239-252 (1996).

Holmes Rolston, III, “Does Nature Need to Be Redeemed?” *Zygon* 29(1994):205-229.

Presentation & Discussion: Where Is the World Headed?

Supplemental Readings:

Polkinghorne, John and Michael Welker, eds., *The End of the World and the Ends of God*.

Haught, John. "Ecology and Eschatology" IN *And God Saw That It Was Good . . .*", pp. 47-64.

McFague, Sallie. *The Body of God: An Ecological Theology*.

Peters, Ted. *God: The World's Future*.

Peters, Ted. *Science and Theology: The New Consonance*.

Final Exam

The final exam will be given on the afternoon of August 11. It will cover material presented and discuss over the last three weeks of the course. It will consist of two parts: 1) a short-answer portion requiring identification of names and dates (showing appreciation of their importance to the study of science and religion) and definition of terms and concepts; and 2) an essay portion which requires elaboration upon topics considered in the course.