

SEARCH

Scientists Who Serve God



He Cares About God's Creatures



Biology professor Raymond H. Brand is concerned with the whole "biosphere" in which humans and animals live. As an animal ecologist, he cares about the fate of all forms of "animal life," including some, like insects, that aren't exactly cuddly. Neither are all humans, Ray says—yet God loves us all.

Becoming a Christian and a Biologist

Ray Brand's father immigrated to Canada from England, his mother from Scotland. They met and married in Winnipeg, Manitoba, where Mr. Brand was a butcher. Ray's older brother, who became a Presbyterian minister, was born there. The Brands immigrated once again, to Detroit, Michigan, where Ray was born in 1928.

Young Ray tagged along when his brother roamed the fields with friends, hunting mice and snakes and other creatures. He worked for awhile in a store where his father was a butcher. His parents became fully committed Christians, active first in Detroit's large Temple Baptist Church, later in a neighborhood church, Ward Memorial Presbyterian. At age eleven Ray gave his heart to Jesus at a church camp in Winona Lake, Indiana.

His career choice influenced by a high school biology teacher, Ray entered Wayne State in Detroit. After a year he transferred to Wheaton College in Illinois, from which his brother had graduated. Wheaton was more expensive than the state school, but his parents agreed to pay the tuition for each fall semester if Ray would earn his own way for the second semester. Working at various jobs, he still found time to play varsity tennis and soccer, and to court Shirley, a literature major planning to teach. They married in 1951, a year after he graduated from Wheaton and began graduate work at Michigan.

All Creatures, Mostly Small

At Ann Arbor Ray earned an M.S. in biological sciences and a Ph.D. in animal ecology. Shirley taught second graders while Ray did field work at the E.S. George Reserve, studying habitat selection of wood mice. Shirley felt that their house at the university's field station was home to more mice than the fields and woodlands where Ray was counting them. To protect the mice in his live traps, Ray had to devise a metal shield to thwart uncooperative racoons, intent on doing a little research of their own.

The fledgling Ph.D. went to teach at Westmont College in Santa Barbara, California. In 1955 Westmont was still being developed, so an old two-car garage on campus served as the biology building. For two years Ray taught all the biology plus some education and psychology. After that he had some help.

In 1959 Ray returned to Wheaton College as a faculty member at the invitation of Professor Russell Mixter, resuming ecological studies under a National Science Foundation basic research grant. Now a full professor, he has served as chair of both the biology department and the science division. He has spent summers at the U. of Wisconsin, Oregon State, Argonne National Laboratory, U. of Chicago, and Chicago's Field Museum of Natural History. After a sabbatical year at the Morton Arboretum in Lisle, Illinois (including the summers of 1988 and 1989), Ray continues to spend one day a week as a Research Associate there throughout the year.

Getting The Big Picture

ECOLOGY VS. ECONOMICS

The *eco-* in *ecology* is from a Greek word meaning "house" or "estate." Ecology can be thought of as the study of nature's household. *Economics* is the study of how we humans manage our own household.

Economists tend to think of natural resources as economic inputs for the production and distribution of goods for humans. That sometimes puts them at odds with ecologists, especially Christian ecologists, who think of nature as God's good gift for all species.

In 1988 Ray Brand was the only American to describe research on grassland insects at the 5th Australasian Conference on Grassland Invertebrate Ecology in Melbourne, Australia. He felt somewhat lonely in an audience full of economic entomologists. Use of the potent insecticide DDT had just been banned "down under" after residues turned up in beef and lamb raised for export, so the Australians and New Zealanders were scrambling for more acceptable methods of wiping out insects. Brand, on the other hand, was glad to see large numbers of his little springtails returning to restored Illinois prairies.

What the world needs is a reasonable balance of ecologic and economic concerns. We (humans and all other creatures) are in this thing (our earthly environment) together. If we don't learn to live together we could end up perishing together.

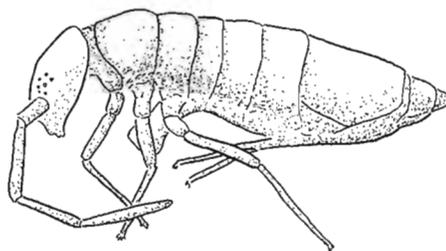
Ray Brand has been a consultant on several environmental engineering projects. At Wheaton he stresses conservation of limited resources and love for all God's creatures. He's a professor who practices what he teaches.

Ecologists study the interactions of living things with other organisms and their physical environment, trying to get a picture of a whole "ecosystem." That means acquiring and piecing together massive amounts of information, often by teams of specialists. Useful data are hard to come by. A fundamental ecological principle is that "everything is related to everything else."

Collecting Some Tiny Bits of Data

Many ecological studies are limited to a clearly defined community of floral (plant) and faunal (animal) populations. In one of his long-range projects, Ray studies populations of a certain kind of insect in three types of Illinois grasslands: *native prairie* (never plowed); *restored prairie* (former cornfield seeded with native plants in 1962 and 1970); and *old field* (agricultural land abandoned since the 1920s). The native prairie has much more floral diversity, with over 500 species of vascular plants compared to 300 in a restored prairie and only 35 in an old field in the Morton Arboretum.

The insects Ray Brand studies are called "springtails" (Order Collembola). These tiny, wingless creatures are found all over the world. From samples of a 3-in. thick layer of litter and humus, their number in one Pennsylvania woodland was estimated to be over 100 million per acre. Their common name comes from a forked appendage attached under the tip of the abdomen, a flick of which can somersault them great distances. Although they are not fleas (Order Siphonaptera), certain species of Collembola have been called "snow fleas" or "sand fleas." Most live on decaying plant litter but some species, called "garden fleas," can harm young living plants. A springtail called "Lucerne flea" is known to damage alfalfa crops.



A typical Springtail, highly magnified

Brand finds that native prairie, with its greater diversity of plant life, shelters a greater diversity of Collembola species. Greater numbers of the insects live there also, varying with the season, amount of rainfall, time of day, and temperature at which samples are taken. No species can yet be identified as *prima facie* indicators of native prairie conditions, but Ray is confident that he can help characterize the complex mix of species that should be included in grassland restoration experiments.

The Human Factor

For the biosphere as a whole, it is the human species that has the greatest effect on "ecological health." Human population growth or accelerated development is destroying the natural habitat of other species in many parts of the world. The same trends can eventually overcome an ecosystem's "biological carrying capacity," and when that happens, *human* habitat may also be lost. In developed countries, overconsumption of fossil fuels and other materials depletes natural resources, making life precarious for future generations. Careless disposal of waste materials pollutes the air and water on which we and all other creatures depend for life.

Ecologists, restricted by the complexity of even the simplest ecosystem and the great variability of living creatures, are nevertheless very good at spotting trends. Few of the ecological trends they see today are encouraging.

Ordinary citizens have begun to pay attention to the warnings of ecologists and environmentalists. Potential global warming from too much carbon dioxide in the atmosphere ("greenhouse effect"), acid rain, declining water quality, shortage of garbage landfill sites, extinction of endangered species, cycles of drought, floods, famine—these and many other problems cry out for solution.

Wilderness, Frontier, or Garden?

To tackle environmental problems, people need reliable scientific data, a sense of responsibility and urgency, and the political will to sacrifice some material goods for other "goods." We also need to think about "our place in nature." At a 1984 meeting of the American Scientific Affiliation (ASA), Loren Wilkinson of Regent College argued that behavior *toward* nature depends largely on one's dominant metaphor *for* nature.

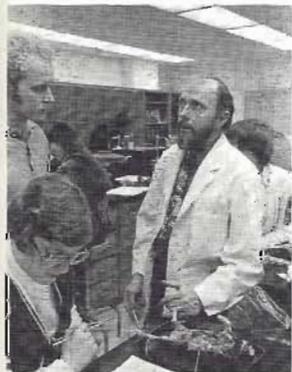
If we see nature as *wilderness*, we see ourselves as intruders who should tread lightly and try to leave creation in as pristine a state as possible. North Americans have typically seen nature as a *frontier*, a more or less hostile environment to be conquered for human use. But nature can also be seen as a *garden* to be tended with loving care. A garden can be both beautiful and useful. The land is neither exploited nor let "run wild." We will continue to exploit some parts of nature, Wilkinson said, but we should leave some wilderness undisturbed and "manage" the rest as a garden entrusted to us by God.

Human Responses to Environmental Crises

Ecological trends reinforce what Romans 8 says about all creation "longing to be set free from its bondage to decay." Romans 8 points to human responsibility but also to hope of redemption through Jesus Christ, of individuals and of a whole creation "groaning in travail."

At a 1978 ASA meeting, theologian Clark Pinnock divided secular environmentalists into "doomsayers" and "technological optimists." The two groups tended to agree on the nature of the problems but differed strongly on how to respond. Pinnock observed that the few Christian writers on the subject at the time fell into the same two camps.

A dozen years later, better data, some experimental approaches that worked (and some that didn't), and a changing political climate have made a difference. Today there is probably more agreement among the experts on what should be done but even less confidence that technology alone can solve all the problems. Today the church is waking up to its biblical call to the stewardship of God's creation, seeing in the transforming power of the gospel a source of hope for turning things around. We can stop being part of the problem and become part of the solution.



In *Whatever Happened to Eden* (1980), environmental consulting engineer John Sheaffer and ecologist Ray Brand included a chapter on "Life Styles That Count." They pointed out that in *Small Is Beautiful*, British economist E. F. Schumacher echoed the words of Jesus: "Everyone to whom much is given, of them will much be required." Sheaffer and Brand concluded that "personal investment in efficient living styles will yield rich dividends at home and around planet earth." In the 1990s, that conclusion is becoming even clearer.

Answering student questions in a bio lab at Wheaton College

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Theological Reflection

Whatever Happened To Eden?

SOME "NATURAL" RESOURCES

Check out *Whatever Happened to Eden* (Tyndale, 1980), by John R. Sheaffer and Raymond H. Brand, a sound, biblically-oriented analysis plus some practical solutions to environmental problems; and *Earthkeeping: Christian Stewardship of Natural Resources* (Eerdmans, 1980), edited by Loren Wilkinson, a classic study from the first (1978-79) interdisciplinary project of the Calvin Center for Christian Scholarship at Calvin College, Grand Rapids, Michigan.

AuSable Institute, associated with the Christian College Coalition, is devoted to cultivating Christian concern for the environment. *The Environmental Crisis: The Ethical Dilemma* (AuSable Trails Institute of Environmental Studies, Route 2, Big Twin Lake, Mancelona, MI 49659, 1982), edited by Edwin R. Squiers, is based on AuSable's 1980 annual forum.

More recent works include Wesley Granberg-Michaelson's *Tending the Garden: Essays on the Gospel and the Earth* (Eerdmans, 1987). Important articles by Christian environmentalists appear regularly in two quarterly journals: *Firmament* (North American Conference on Christianity and Ecology, P.O. Box 14305, San Francisco, CA 94114); and *Perspectives on Science and Christian Faith* (American Scientific Affiliation, P.O. Box 668, Ipswich, MA 01938). For example, see Raymond H. Brand's "At the Point of Need" in the March 1987 issue of *Perspectives* (Vol. 39, No. 1, pp. 2-8).

As a Christian ecologist, Ray Brand tries to be consistent in his stewardship. That means working at many levels, as in the environmentalist's credo: "Think globally but act locally."

Acting (and Thinking) Locally

Ray and Shirley have done a number of things to make their home energy-efficient, insulating and installing a heat-pump to lower their heating and cooling costs. In winter a cozy fire in the living room heats water pipes in the fireplace grate for storage in a 1,100-gallon tank in the basement. They try to consume less and recycle more. On campus Ray sponsors a student-run recycling operation called Earthkeepers.

Ray has served on the board of reference for a marsh environmental development plan of the Wheaton Park District and is a member of the Illinois Environmental Council. Though hardly a political activist, on at least one occasion he entered the political fray to try to change things by electing an environmentalist to local office. Ray says his experience as campaign manager was valuable even though his candidate lost by a slim margin. The campaign made voters more aware of environmental issues.



An ecologist contemplates his place in nature

Thinking (and Acting) Globally

Asked to chair ASA's Commission on Global Resources and the Environment, Ray also organized a program on that theme for ASA's 1987 national meeting. After passing the leadership role to someone else, he is helping to prepare environmental stewardship materials for adult discussion groups in churches.

The Brands' children are no longer at home, but as a professor in a Christian college Ray is able to influence other young people toward concern for God's creation and toward environmentally helpful careers. In 1989-90 he chairs a faculty committee overseeing Wheaton's program on Human Needs and Global Resources. Since 1976 the HNGR program (pronounced "hunger") has sent student interns to Third World countries for six months as part of their education. HNGR interns are supervised by a local staff worker in some agency devoted to meeting basic needs of poor people in a specific place.

In their year of preparation, students in the program take HNGR core courses, language courses, and electives to help them design and carry out a research project during their internship. For example, a literature major developed a cultural thesaurus in Guatemala. A psychology major documented adjustment problems of female migrants to a city in Kenya. A biology major in an African country showed that villages with wells had far lower infant mortality rates than villages dependent on surface water supplies.

Ray Brand believes that Christians should encourage the use of science for the benefit of the world's neediest people and for the careful management of our global ecosystem.

*But those who look into the perfect law,
the law of liberty, and persevere,
being no hearers who forget but doers who act,
they shall be blessed in their doing.*

James 1:25, RSV (paraphrased)

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Thoughtful Worship

Taking Stewardship Seriously

This issue of **SEARCH** (No. 08) was prepared by Walter R. Hearn of Berkeley, California. Design and layout by ASA managing editor Nancy C. Hanger. Opinions expressed in **SEARCH** are those of individuals and may not be representative of the entire ASA membership. Scripture quotations are from the Revised Standard Version unless otherwise noted.

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The 1989 version of ASA's 48-page guidebook, *Teaching Science in a Climate of Controversy*, helps teachers cope with questions of science and religion. It is available postpaid from ASA at \$6 for one copy, \$5 each for 2-9 copies, \$4 each for 10 or more copies.

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