



How Should Christians Treat Animals in Research?

One of the most contested and perennial issues in how we relate to our environment is the use of animals in research. Seventh-day Adventists associated with educational and health-care institutions engage in animal research. When properly regulated under current local, national, and international accrediting bodies, this research is justifiable. Nonetheless, I will make some proposals that will encourage Adventists to move away from research that necessitates pain and suffering in animals.

The Use of Animals in Research

The prevailing arguments in favor of using animals in research programs tend toward various forms of utilitarianism. Within this framework, three primary rules apply: replacement, reduction, and refinement. Established with the publication of *The Principles of Humane Experimental Technique* by

W. M. S. Russell and R. L. Burch in 1959, these three “R’s” provide a conceptual framework for morally responsible utilitarian logic.¹ Put simply, if there are alternatives to using animals, then a researcher should “replace” the animals. Then, efforts should be made to “reduce” the number of animals being used. Finally, researchers should “refine” their experimental techniques in order to avoid causing unnecessary pain to the animals involved.

The prevailing arguments against using animals in research center on the idea of animal rights and assert that basic among those rights is freedom from pain and suffering.² While this article is not an argument about animal rights, Adventist educators need to recognize the existence and impact of this line of reasoning in the ethics of animal research. Parallel to the basic definition of human rights, that every person is inherently entitled to certain rights simply because of being human,³ an animal-rights definition asserts sim-

ilar protections and freedoms for animals (or non-human creatures, to be precise).⁴ We must engage this conversation at some point, and when we do, we will have to specify to what degree animal rights exist and how those rights jibe with human rights.⁵

How Animal Research Is Conducted

Of primary concern is the laboratory research inflicted upon animals that causes them pain and suffering.⁶ Such research must be morally justified. This is usually accomplished via national legislation but also increasingly through international oversight groups. The single most important international oversight agency is the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

The regulations enforced in the United States are primarily shaped by

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the Animal Welfare Act, a Federal law enacted in 1966 and amended six times, most recently in 2007. This act is implemented and enforced by multiple agencies with overlapping jurisdictions—primarily the United States Department of Agriculture (USDA), the U.S. Department of Health and Human Services' Office of Laboratory Animal Welfare, and the National Academy of Sciences' Institute for Laboratory Animal Research. Many other Federal and state agencies like the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) and National Institutes of Health's (NIH) Office of Biotechnology Activities, to name but a few, also have significant indirect regulatory oversight on the use of animals for research and experimentation.

Any U.S. research facility using vertebrate animals that is accredited by AAALAC and guided by the USDA's Office of Laboratory Animal Welfare is required to carefully manage and monitor each research program under its roof. Thus any researcher who wants to use animals must first seek approval of the organization's Institutional Animal Care and Use Committee (IACUC). The IACUC is required to provide oversight of all research protocols occurring under the auspices of the institution. The researcher and committee must determine how many animals are needed and how to protect them from unnecessary pain and distress. Furthermore, strict oversight must be provided by IACUC regarding such decisions as where the animals are kept, what they are fed, how much ventilation they receive, how frequently the bedding material in their housing units is changed, and how often housing units are cleaned. All of these details are included in the various provisions established and are based upon the Animal Welfare Act referred to above.

The documents that provide oversight and management of the actual research upon animals form a vast body of literature and regulation. The level

of detail is phenomenal and at least as—if not more—rigorous than the policies associated with research protocols using human subjects. What can we glean from these documents with regard to how Adventists might responsibly engage in research using animals in the educational and health-care institutions so vital to our church?

Principles Worth Upholding

Three levels of regulation and over-

monitored by the institution/school.

2. *Local:* Institutional oversight must comply with all relevant local government laws. These laws will vary widely around the world in the many nations within which the church maintains educational institutions. Regardless of variation, local legislation must be followed. For instance, vivisection (the dissection of live animals) is forbidden in England but not in the United States.

3. *International:* Independent and



sight must be maintained if we are to engage in morally defensible animal research:⁷

1. *Institutional:* All research must be monitored and regulated by the institutions within which it occurs. Expressing this negatively, within the specific context of the Adventist Church: No individual researcher/teacher in a Seventh-day Adventist educational institution should engage in research/class exercises involving live animals without direct institutional oversight. This oversight must be arranged and

international accreditation offered by organizations such as AAALAC should be sought and maintained by all Seventh-day Adventist educational institutions engaging in animal research. These organizations provide the gold standard for all efforts to justify research on animals that could potentially cause abuse or suffering.

While these three fundamental principles provide practical guidance regarding the ethics of animal research, they cannot, and do not, establish adequate conceptual guidance for the Adventist Church and its institutions. The



conceptual problems associated with animal research revolve around issues of morality informed by Scripture, theology, and church teaching.

A Three-Point Proposal

Here are three strategies for developing ethical policies for experimentation on animals in church health-care and educational institutions:

Proposal No. 1: Establish a Consensus that all non-human creatures have moral status.

Thus, laboratory research⁸ and classroom activities that cause pain to and death of animals must be morally justified. This assertion recognizes that the non-human animals created by God have inherent moral value.⁹ “Moral value” or “status” are terms used in ethics that help us conceptualize “who or what is so valuable that it should be treated with special regard.”¹⁰ I use “moral status” here in order to note our *intuitive, nurtured, and commanded* sense that the object to which we refer has moral significance:

- *Intuitive* because, as creations of God bearing His image, we understand intuitively (when we follow His will) that other parts of His creation are morally important.

- *Nurtured* because we take God’s Word seriously in our personal, familial, and congregational life, and Scripture teaches that God cares for His creation. Therefore, we also ought to care for it. *Ought* implies moral obligation or status.

- *Commanded* because we have been assigned by God a particular role and responsibility within His creation, as stewards, to morally value and care for other parts of His creation. We bear the onus of responsibility, which means that we should treat the rest of creation as God Himself would treat it.

To put it negatively, if we mistreat an object of God’s creation (one for

which He has told us we are responsible [Genesis 1:26-28]), we have committed a moral wrong, a sin. To illustrate, there is little or no debate about the moral ramifications of crushing rocks to make gravel. Crushing the skulls of live animals in order to conduct research that might further our knowledge about human brain trauma constitutes an entirely different level of moral activity, and we must recognize it as such. If we do not, we are morally retarded and fail to reflect properly God’s image. It is right for us to grant a higher moral status to live animals than to rocks, because we rightly believe that God Himself places a higher value upon animate than inanimate life.

The Seventh-day Adventist Church’s official statements regarding the moral status of God’s creation emerge in two different forms, the 28 Fundamental Beliefs and the “Official Statements” issued by the General Conference. Fundamental Belief No. 6 entitled *Creation* states that humankind, made in the image of God, represented “the crowning work of Creation.” Echoing the words of Genesis 1:26 (KJV), the statement notes that we were “given dominion over the world, and charged with responsibility to care for it.”¹¹ In regard to how the belief is interpreted and published in *Seventh-day Adventists Believe*, we find two passages: One asserts that we have a “divinely bestowed responsibility of preserving the quality of our environment”; the other notes that “because life is a gift of God, we must respect it; in fact, we have a moral duty to preserve it.”¹²

Proposal No. 2: Re-evaluate Our Theology of Stewardship. The lens of theological ethics helps us understand what is at stake in the creation accounts of Genesis: our identity, our role, and our place in God’s creation. There are two primary metaphors essential to a biblical, and thus, Adventist interpretation of our role in God’s created order, namely, “dominion” and “stewardship.”¹³

On having dominion. Throughout the

course of history, humans have narrowly interpreted dominion to mean that they could be dominators, users, takers, and abusers of the rest of the creation that God declared “good.” Applying the metaphor of dominion, Christians in Western society came to regard the rest of creation as possessing value only as it benefitted humankind.¹⁴ In his biblical exploration of dominion and stewardship, Richard Bauckham put it this way: “. . . the idea of human dominion has been the ideological justification of human domination and exploitation of nature. . . . The modern culture of materialistic excess has developed in the context of a notion of dominion as an unrestricted right of masters and owners to exploit all the resources of creation.”¹⁵

How humans relate to the rest of God’s creation is revealed through their beliefs and actions. When something (say a snail) has intrinsic value, it has value in and of itself simply because God created it. Thus, God does not need to command us to value the snail. Christians who hold this view typically argue that all of God’s creation has intrinsic moral value. Those who hold a different view assign value as the result of a conscious choice or because God commands it. That is, they believe the snail has no intrinsic value. Rather, it attains value only when humans attach value to it (either because God has told us to or because we like what it does for us).

Obviously, one can use a very complex scale to take a position on the intrinsic/extrinsic value of the rest of God’s creation. At either extreme are the following two positions:

- All parts of God’s non-human creation are intrinsically valuable (have moral status) because He created them and pronounced them good. Value is present in the entity itself.

- All parts of God’s non-human creation are extrinsically valuable (have moral status) if they benefit humankind. Whether a stone or a Great Ape,



CARING FOR GOD'S ANIMAL CREATIONS: ETHICAL PRINCIPLES

An area closely related to, but broader than the focus of this article, is ethical principles for Christians in their interactions with animals under their care. What follows is a summary of Gerald Winslow's chapter, "What Christian Principles Guide Our Relations With Animals?" from the new book *Entrusted: Christians and Environmental Care*,* which offers three premises that orient the reader to a biblical approach, followed by one foundational principle with three specific implications for how we treat non-human animals under our care. The term *care* in this case encompasses a broad definition that includes pets; animals in service to humans (such as horses and dairy cows); animals used in research; residents of zoological parks, science exhibits, and museums; creatures we raise and slaughter for food; as well as those we hunt and fish.

Three Orienting Premises:

1. *How we care for and relate to animals must be informed by the perspective of eternity.* Viewing our present situation in relation to God's plans for a new heaven and a new earth makes us realize that currently, life on earth is not the way it should be. Our current situation is skewed by the reality of human sin and its effects on every part of God's creation.

2. *Sin distorts our relationship with the animals under our care.* This corruption is so thorough and ingrained that we need God's help to discern how best to care for His creation. Due to our sinful condition, the knowledge and dedication that it takes to properly care for animals does not come naturally to humans. By studying Jesus' redemptive life and modeling His character in our lives, we can gain insight into proper relationships with God's human and non-human creations. Acknowledging animals as creations of God should produce tangible results. Since all creatures were created by, loved by, and therefore belong to God, what principles should we as His stewards embrace in our decisions about how to treat the animal under our care?

3. *We must embrace the principle that all God's creatures have moral value.* Humans interact with the animals under their care in a vast variety of ways. We must recognize that too many of these patterns of treatment result in the suffering and death of animals. We are morally obliged to do what we can to minimize this outcome of animals' interactions with us. It is surprising that we humans can love and care for a variety of animals as pets while at the same time killing others of God's creatures to consume as food, and daily interacting with diverse animals in countless thoughtless, uncaring ways. The fundamental premise that should set the tone for how we treat animals calls for us to reduce the pain, suffering, and death we cause them.

With these three premises in mind, it becomes clear that a principled response to God's love of all creation calls us to moral responsibility in relationship to non-human animals. We are morally obliged to do all we can to help these creatures flourish. Three specific assertions emerge from this principle:

- Animals under our care deserve nurture and affection, not neglect or abuse.
- Killing or injuring animals for sport or entertainment is wrong.
- A plant-based diet is ethically preferable.

When we respect and care for non-human animal life, we show our reverence for God and all His creation. He challenges us to be morally responsible believers by allowing our vision of a future eternity to shape our relationships today.

* Gerald R. Winslow, "What Christian Principles Guide Our Relations With Animals?" in *Entrusted: Christians and Environmental Care*, Stephen Dunbar, L. James Gibson, and Humberto Rasi, eds. (Adventist Publications, 2013), Chapter 7, pp. 65-74.

the entirety of creation has value only as it enhances human life. Value is instrumental to humankind.

My theological ethics framework compels me to take the position that all things God created possess at least some moral status; therefore, I have a moral obligation to be a responsible steward of every part of God's creation.

On being responsible. The responsibility that God assigns humankind is a moral one—to engage in a managerial role within His creation. This role is best understood within the theological framework of the principle of stewardship. Stewardship, argues Bauckham, is a "vocation of caring responsibility for other creatures."¹⁶

I am convinced that we must understand the metaphor of dominion through the metaphor of stewardship and responsibility. With Bauckham, I would note that "the human relationship to the rest of creation, as intended by God according to the biblical material . . . cannot be easily summed up by a single term such as stewardship."¹⁷ The expository document of Adventist Fundamental Beliefs blends both metaphors in its reference to Adam and Eve's responsibility: Theirs "was the responsibility to rule graciously over the world, imaging or reflecting God's beneficent rule over the universe." Additionally, the document urges us toward the view that "as human beings, we are to act like God because we are made to be like God. Though we are human, and not divine, we are to reflect our Maker within our dominion in every way possible."¹⁸

Three Official Statements produced by the Adventist Church are relevant in defining our role as stewards of God's creation (listed here chronologically): *Caring for Creation—A Statement on the Environment*; *A Statement on the Environment*; and *Statement on Stewardship of the Environment*.¹⁹ The only one that explicitly mentions animals is *Caring for Creation—A Statement on*



the Environment, which refers to “wildlife” being “plundered” as a result of human disobedience to God.²⁰ I deeply appreciate these statements, finding them among the most eloquent ever made by our church. However, aside from these statements, there has been little effort by the church to shape an ethic of responsibility oriented toward the environment in general or animals in particular. Nonetheless, our church has called us to “respect” creation, use “restraint” in our relationship toward Earth’s resources, “re-evaluate” what we really need, and “reaffirm” the “dignity of created life.”²¹

Proposal No. 3: Move Medical Research Beyond the Use of Live Animals. As we use animals in laboratory and medical research, we must do so with full recognition of the previous two proposals, namely, that these animals have intrinsic moral status and that we are morally responsible as God’s stewards. Clearly, research conducted on animals has instrumental or extrinsic value to both humankind and animals. We benefit tremendously from this research as does the animal world itself. Even in light of this more pragmatic reality, the intrinsic moral worth in animals should make us reluctant to conduct research that causes them pain and suffering or results in their death. In cases where Adventist research is certified by organizations such as AAALAC, we can be sure that we are maintaining high standards. But high standards may take on a type of status quo that should be unacceptable to us as God’s stewards. A more aspirational approach, which calls us to the highest standards, should motivate us. If indeed we are called to treat animals as God Himself would treat them, we must seek alternatives.

Other models of research must be developed and encouraged that will discontinue exposing these animals to harm. The 3R’s approach to minimizing pain and suffering (Reduce, Refine, Replace)

is consistent with this assertion. When carried to their logical end, the 3R’s move us completely away from any use of animals in educational and research protocols that causes them pain and suffering. The *Guide for the Care and Use of Laboratory Animals* (one of the three primary resources used by AAALAC) describes replacement as follows:

“Replacement refers to methods that avoid using animals. The term includes absolute replacements (i.e., replacing an-

making some inroads.²⁴

Two simple illustrations can make the point that seeking alternatives is viable. First, the trend over the past 20 years has been for fragrance and skincare product companies to identify alternatives to testing their products on animals.²⁵ So, for instance, rather than dropping some potentially harmful chemical into the eyes of a puppy, they duplicate the physiological context of a puppy’s eye in a glass petri dish (i.e., *in vitro*), and inject the



imals with inanimate systems such as computer programs) as well as relative replacements (i.e., replacing animals such as vertebrates with animals that are lower on the phylogenetic scale).²²

A number of institutions are participating in the effort to find alternatives to animal use in research.²³ Consistent with the Guide, there are two broad categories of alternatives: (1) *in vitro*, literally “in glass,” procedures that are slowly replacing many animal testing and experimentation processes; and (2) *in silico* or computer modeling programs, which are also

chemical into that environment instead. Second, years ago, pregnancy testing involved killing a rabbit.²⁶ A test once considered “alternative” (using a test strip that measures hormonal levels in urine) is now considered standard practice.²⁷

While we may presently find it justifiable in some cases to cause pain and suffering in laboratory animals, using the best possible practices and oversight methods, we do not have to settle for this approach in the long term. We



can and must do our best to manage this domain of our stewardship so that we abandon most procedures that cause pain and suffering in animals or result in their death. We can and must aspire to a higher level of responsibility to God and the rest of His creation.

Summary

Seventh-day Adventists around the world who may be involved in animal research or the use of animals in education that might cause them pain and suffering face a moral and ethical dilemma. There are strict guidelines that must be followed in order to engage in these activities in morally appropriate ways. Beyond these practical guidelines, we would do well to think clearly about our biblical and theological convictions as Adventists with regard to non-human creatures, and our relationships to them. The church has some beliefs and statements that can serve to move us forward into more thoughtful reflection on our role as stewards in God's creation. It is our responsibility now to make the effort to move in that direction. ✍

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NOTES AND REFERENCES

1. W. M. S. Russell and R. L. Burch, eds., *The Principles of Humane Experimental Technique* (London: Methuen Press, 1959).

2. One may agree or disagree with the notion of rights, but the idea of animal rights is here to stay. There are responsible Christians who carefully use Scripture and theology to argue in favor of animal rights, or at least something conceptually akin to animal rights. (See Endnote 5 for a brief list of resources.) While we as Seventh-day Adventists have supported human rights, we have not officially engaged in any effort to support animal rights. Whether the church will formally support animal rights is difficult to predict, but I suggest that if we believe human beings are created in God's image and take our role as stewards of His creation seriously, we must move toward conceptual agreement with the idea that animals have rights. Of course, what those rights entail will remain contested for a long time, just as specific

human rights remain contested across our world today. However, one of the rights that humans certainly have is freedom from pain and suffering. In the words of the United Nations Declaration, Article No. 5, "No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment": <http://www.un.org/en/documents/udhr/index.shtml>. Similarly, many argue that animals with some measure of what we call sentience must have the right to be free of pain and suffering; particularly that caused by humans. If we find scriptural support for this right, further discussion must occur to define "pain" and "suffering." What sort of pain does a sentient animal experience? Can a distinction be drawn between pain and suffering in the life of a non-human animal? If pain is a biological and neurological experience that needs cortical interpretation, then what would constitute pain and suffering for those animals that do not possess complex brains?

3. See James W. Nickel, "Human Rights," in *Encyclopedia of Ethics*, 2nd ed., Lawrence C. Becker and Charlotte B. Becker, eds. (New York: Routledge Press, 2001), pages 796-800.

4. *The Encyclopedia of Ethics* (ibid.) offers an article entitled, not "Animal Rights," but instead "Animals, Treatment of." A salient quote regarding the assertion and development of the idea of animal rights comes from this statement: "When Mill writes that 'all great movements go through three stages: ridicule, discussion, adoption,' those who are active in the animal rights movement understandably hope he speaks prophetically of their cause" (Tom Regan, "Animals, Treatment of," p. 73).

5. The following is a brief sampling of more important and/or more recent publications on Christian thought and theology in relation to animal rights: David J. Atkinson, "Rights, Animal," *New Dictionary of Christian Ethics and Pastoral Theology*, David J. Atkinson and David H. Field, eds. (Downers Grove, Ill.: InterVarsity Press, 1995), pp. 745-747; Richard Bauckham, *Living With Other Creatures: Green Exegesis and Theology* (Baylor, Texas: Baylor University Press, 2011); Richard Alan Young, *Is God a Vegetarian?: Christianity, Vegetarianism, and Animal Rights*, Foreword by Carol J. Adams (Chicago: Open Court, 1999); Andrew Linzey, *Why Animal Suffering Matters: Philosophy, Theology, and Practical Ethics* (New York: Oxford University Press, 2009); _____, *Christianity and the Rights of Animals* (Chicago, Ill.: Crossroad Publishing Co., 1987); Norm Phelps, *The Dominion of Love: Animal Rights According to the Bible* (New York: Lantern Books, 2002); Stephen Webb, *On God and Dogs: A Christian Theology of Compassion for Animals*, Foreword by Andrew Linzey (New York: Oxford University Press, 2002); Tony Sargent, *Animal Rights and Wrongs: A Biblical Perspective* (London: Hodder & Stoughton Religious, 1996); J. Regina Hyland, *God's Covenant With Animals: A Biblical Basis for the Humane Treatment of*



All Creatures (New York: Lantern Books, 2000); and Donna Yarri, *The Ethics of Animal Experimentation: A Critical Analysis and Constructive Christian Proposal* (New York: Oxford University Press, 2005; see especially Chapter 4, “Animal Rights”).

6. Presently in the United States, for instance, an estimated 25 million vertebrates are used in a variety of research protocols involving testing and educational processes. The types of animals being used are predominately mice and rats (roughly 90 percent). The remaining 10 percent includes dogs, cats, pigs, sheep, and chimpanzees. See http://www.humanesociety.org/issues/biomedical_research/qa/questions_answers.html#Q_How_many_animals_are_used_each_year_in. All Websites cited in the endnotes were accessed in July 2013.

7. This proposal assumes personal responsibility on the part of the researcher.

8. I would include here routine instruction in Adventist biology curricula that uses live animals. In other words, all vivisection presently allowed in our educational system must stop. Furthermore, the routine practice of dissecting dead animals in science classes is ugly, unnecessary, and now, more expensive than the alternatives, which are more humane and equal to, if not superior educationally. See the following Website for a wealth of information on excellent alternatives: <http://www.teachkind.org/dissectalt.asp>.

9. This is not to say anything about whether or not animals are capable of being moral creatures. It does make a profound statement about humans’ ability and obligations as moral creatures. Part of this obligation moves us to recognize the moral value of other creations of God.

10. My colleague James Walters, Ph.D., used this phrase in his article “Moral Status” in the *Encyclopedia of Bioethics*. He notes also that while moral status is not a new concept, its technical use has emerged in part through public debate about the value or status of the human embryo. There is no tie to the animal-rights movement or to any particular ideology. It is a tool that helps each of us categorize “who or what is” valuable to us and why. As Walters notes, we may throw pebbles on the beach into the water, “but the people bathing on that same beach are totally different. To wantonly toss one of them into the same water would constitute an immoral, reprehensible act.” Using moral status as a way of framing the reasons why is commonplace in ethics. See Jim Walters, “Moral Status,” *Encyclopedia of Bioethics*, 3rd ed., Stephen G. Post, ed. (New York: Macmillan Reference, 2004), pp. 1855-1864.

11. “Creation,” available at <http://www.adventist.org/beliefs/fundamental/index.html>.

12. *Seventh-day Adventists Believe: A Biblical Exposition of Fundamental Doctrines* (Boise,

Idaho: Pacific Press Publ. Assn., 2005), pp. 85, 86.

13. As a theological ethicist, I read Genesis 1:24 to 31 as both descriptive and prescriptive with regard to our moral responsibility in God’s overall creation. A Divine Command form of ethics can easily assert that this passage commands that humans fulfill a particular role in creation. A narrative form of ethics helps the reader situate himself or herself within God’s overall design; it orients the reader to a thoroughgoing creation in which humans find themselves. Theologically, there is little reason to argue over this text. Both the Divine Command approach and the narrative approach clearly place humankind in a position of moral responsibility for the entirety of God’s creation. There is good reason to believe, as well, that God desires that everything He has created should thrive as an integral part of the whole.

14. See Ernest Fortin, “The Bible Made Me Do It: Christianity, Science, and the Environment,” *Review of Politics* 57:2 (Spring 1995):197-224 for a survey of the history of Christianity and the environment. See also Gene M. Tucker, “Rain on a Land Where No One Lives: The Hebrew Bible on the Environment,” *Journal of Biblical Literature* 116:2 (1997):3-17.

15. Richard Bauckham, *The Bible and Ecology: Rediscovering the Community of Creation* (Waco, Tex.: Baylor University Press, 2010), p. 37.

16. *Ibid.*, Preface, no pagination. A steward is not an owner. Being a steward is more like being a store manager. The manager may have a range of responsibilities, depending upon the concerns of the owner. The manager may receive a good deal of instruction about what the owner wishes for the store. But the manager cannot simply do whatever he or she wishes with the store. The manager cannot engage in some activities without failing his or her responsibilities. He or she cannot, for instance, destroy the inventory or burn down the store because it seems like the right thing to do.

17. Bauckham, *The Bible and Ecology*, op. cit., pp. 33, 34.

18. *Seventh-day Adventists Believe*, op. cit., p. 99.

19. *Caring for Creation—A Statement on the Environment*, available at <http://adventist.org/beliefs/statements/main-stat5.html>; *A Statement on the Environment*, available at <http://adventist.org/beliefs/statements/main-stat9.html>; *Statement on Stewardship of the Environment*, available at <http://adventist.org/beliefs/statements/main-stat10.html>.

20. *Caring for Creation—A Statement on the Environment*, *ibid.* This is a one-page statement.

21. These quotes appear in both *A Statement on the Environment*, op. cit. and *Statement on Stewardship of the Environment*, op. cit.

22. “Guide for the Care and Use of Labora-

tory Animals” (NRC 2011). Available at http://www.aalac.org/resources/Guide_2011.pdf.

23. Among these institutions are the following: (1) Physicians Committee for Responsible Medicine: <http://www.pcrm.org>. Look for the link to “ethical research and education”; (2) Johns Hopkins Bloomberg School of Public Health’s Center for Alternatives to Animal Testing: <http://caat.jhsph.edu>. This center has an extension facility in Europe at the University of Konstanz, Germany: <http://cms.uni-konstanz.de/leist/caat-europe>; (3) In the United Kingdom, the national center for this movement actually includes the 3R’s in the title: National Centre for the Replacement, Refinement, and Reduction of Animals in Research (NC3R’s): <http://www.nc3rs.org.uk>. The Johns Hopkins CAAT Center lists 36 centers around the world whose goal is to carry forward the 3R’s agenda to find alternatives for animal testing. In addition, they maintain a journal (*ALTEX: Alternatives to Animal Experimentation*) and a Website dedicated to gathering credible news on alternatives to the use of animals in experimentation (Altweb: The Global Clearinghouse for Information on Alternatives to Animal Testing): <http://caat.jhsph.edu/resources>.

24. For instance, there is a 14-year-old journal entirely devoted to molecular biology via computer: *ISB In Silico Biology: An International Journal on Computational Molecular Biology*: <http://www.bioinfo.de/isb>.

25. In Europe, the European Union’s Office of Consumer Affairs has issued a directive that prohibits cosmetics companies from testing their products on animals: http://ec.europa.eu/consumers/sectors/cosmetics/documents/directive/index_en.htm: “Article 4a: 1. Without prejudice to the general obligations deriving from Article 2, Member States shall prohibit: (a) the marketing of cosmetic products where the final formulation, in order to meet the requirements of this Directive, has been the subject of animal testing using a method other than an alternative method. . . .” Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1976L0768:20100301:en:PDF>.

26. While popular references to this test often refer to the rabbit dying as a result of the pregnancy test, this was true only in the early versions of the test in the 1920s. In keeping with the 3R’s approach, later refinement of the test simply allowed for the examination of the rabbit’s ovaries to see whether or not the woman’s urine had a measurable effect on them. See <http://snopes.com/pregnant/rabbit.asp>.

27. See Carol Howard, “Yes, Dad, There Are Alternatives,” *AV Magazine*, a publication of the American Anti-Vivisection Society (Spring 2005). Available at <http://caat.jhsph.edu/publications/Articles/aavs.html>.