ful interests of the industries involved, frustrating both the short- and long-term goals of the animal rights movement. The results of such efforts are typically regulations without real teeth and, worse, added legitimacy to the industries themselves, stemming from their involvement in establishing the regulations.

The solution, according to Francione, is to return to the ideological dispute and to the more robust notion of animal rights: Animals have a basic right not to be used in purely instrumental ways to further human interests. In short, the cleansing rain of our morally appropriate treatment of animals cannot arrive without the preceding thunder of a truly revolutionary way of thinking about the interests of animals relative to those of humans.

This argument is interesting and important. Unfortunately, as it is stated, it is compromised by black-and-white thinking at three interrelated levels.

At the level of ideology, Francione assumes that if humans are not to treat animals in an entirely instrumental way, then we must treat them in an entirely non-instrumental way. This assumption leaves a lot of ground uncovered: Why not treat animals in any of a wide variety of partially instrumental ways?

The basic right of persons to be treated in entirely non-instrumental ways—that is, the right not to be interfered with—is anchored in the fact that we have lives of which we are subjectively aware, the content and duration of which matter greatly to us given the extent of our awareness of them. Nonhuman animals have varying degrees of a similarly subjective awareness of their lives—but the question is, how similar is similar, and how varied is varied? Without more argument than Francione provides, it simply does not follow that because all animals have some degree of subjective awareness, they all have the same basic right as persons to non-interference.

The same problem of black-and-white thinking recurs at the level of legal reform. According to Francione, US law recognizes two categories of beings: persons and property. Because we can do whatever we want with our property, then so long as animals remain property we will be able to do whatever we want with them. The only way to better our treatment of animals, says Francione, is to move them from the category of property into the category of persons.

But the real problem may be the way that the law divides us into persons and our property. In large measure, the current social morality of the United States is based on a self-interested calculus of property rights: If you are disallowed any morally legitimate claims against my property, I am equally disallowed any similar claims against yours, whether or not one of us is sleeping under a bridge. Why expect that humans will behave any better toward animals without at the same time behaving better toward one another? Given the high level of human inequality in the United States and the world, how can one make headway on behalf of animals without tackling the root cause of both problems: the narrowing of moral concern that comes with any society that chooses as its central moral ideal the exclusively individual ownership of the material means necessary to pursue meaningful human lives?

Not surprisingly, the earlier problems of black-and-white thinking percolate down to the level of practical action. Rather than working for the more humane treatment of animals in their current uses, we ought once again to move to an opposite extreme, according to Francione, and take whatever incremental steps we can toward an exclusively non-instrumental use of animals. This position again assumes, with insufficient argument, that we need not concern ourselves with balancing human and animal interests because, according to Francione, animals have the same basic right as humans to non-interference in their lives.

But there is an additional practical problem with ignoring the ways in which human and animal interests might intersect. Current feminist theory recognizes that because different kinds of social inequality are mutually reinforcing, feminist movement for change must work to eradicate all of them at once. In fact, focusing attention on only one form of social inequality might actually deepen other forms of inequality, creating a situation in which it is impossible for grassroots organizations to build a coalition to work against their common sources of exploitation.

Incrementally ending certain agribusiness practices will certainly not upset the world food economy in any significant way because whether or not relatively wealthy first-worlders eat meat, we will eat something. The types of business concerns that are easiest to eradicate are those that are protected by the least powerful human interests in the world of agribusiness. Thus, the humans most likely to be affected by incremental changes are those who are most exploited by the current world food economy. If it is not to be divisive, the fight for greater social justice will have to pay attention to the interests of all individuals who are currently exploited, whether they be animals or humans.

Including animals in the fight for greater social justice will thus require us to be much more careful than Francione suggests in finding the appropriate balance between animal and human interests. Until then, most of us are still at work on Maggie's Farm, folding our hands and praying for rain.

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TEACHING IN THE TWENTY-FIRST CENTURY


If you are a science teacher who has been in the classroom during the past five years, you may be just a little overwhelmed. The omnipresent curriculum reform movement has shifted directions since the publica-
tion of the Benchmarks for Science Literacy (AAAS 1993) and the National Science Education Standards (NRC 1996). The old paradigm of teacher as dispenser of facts is being replaced by inquiry-based learning. This paradigm shift is somewhat unsettling for educators who grew up under the authoritative model that placed the teacher at the center of the process. Now educators are being asked to develop science curricula that emphasize learning before teaching and place more responsibility for learning with the student. Students are expected to learn science by doing science in the way scientists do science. Combine this paradigm shift with the rapid expansion of computers and communication technology in the classroom, and it is understandable why some science educators feel their heads spinning.

Fortunately, extremely valuable and relatively inexpensive resources are now available to interface cybereducation with inquiry-based science learning. Recently, the final two installments of a four-volume series, Innovations in Science Education and Technology, designed to push science education into the twenty-first century have been published by Plenum Press. If you are new to cyberspace and inquiry-based learning, I suggest that you obtain a copy of Internet Links for Science Education: Student-Scientist Partnerships, which was edited by Karen C. Cohen. After reading the first few chapters, you will have a much better understanding of learning science as a process of discovery and of how the Internet and the World Wide Web interface with this new paradigm.

At this point, however, you will probably want to boot up your computer and connect to some of the Web sites listed in the individual chapters and the appendix. Within a few minutes, you will be downloading curricular materials suitable for teaching inquiry-based science at the K–12 level. With a little more planning, you might register your class in Cornell University's Classroom Feeder Watch program, develop an activity in which your students generate online plots of seal and whale movements from satellite data at WhaleNet, or register to participate in a study of Monarch butterflies through the University of Kansas's Monarch Watch Web site. If you really get hooked, you will send e-mail to NASA's Jet Propulsion Lab (JPL) and request that your students be made part of a planetary exploration team. At the JPL site, students collaborate with scientists to develop future space exploration plans. Unfortunately, as with all books that list Web sites, some of the URLs are not valid, and some Web sites are no longer involved with the projects described in this book.

Science educators with some experience with cyberspace and with the desire to develop their own Web...
Taking In the Sites

Visit the following sites to learn more about conservation issues worldwide.

The Consortium for International Earth Science Information Network (CIESIN) provides information about environmental treaties and national resource indicators at its Web site, http://sedac.ciesin.org/pidb/pidb-home.html, which is entitled "Environmental Treaties and Resource Indicators (ENTRI)." The ENTRI system integrates data from the World Conservation Union, the United Nations Environment Programme, Freedom House, The Fletcher School of Law and Diplomacy, the World Resources Institute, the British Columbia Ministry of Environment, Lands and Parks, and the Antarctic Cooperative Research Centre. Searches are organized around a set of nine specific "issue areas" that are widely recognized by scholars and policymakers as being critical to understanding the human dimensions of global change.

The World Conservation Monitoring Centre provides visitors with information about protected areas worldwide at its Web site, http://www.wcmc.org.uk/protected_areas/data/. Visitors can select a country or an area (e.g., Antarctic Treaty Territory) for a synopsis of that country or area's policies and legislation concerning protected areas. In addition, this site lists the size and population of the country or area in question and the rate at which its population is increasing, as well as its economic indicators and gross national product. This organization also offers information about threatened species at http://www.wcmc.org.uk/species/data/.

Fauna & Flora International, an organization whose mission is to safeguard the future of endangered species of animals and plants, allows visitors to access lists of news events, which are organized by month, and to access its semiannual newsletter, http://www.wcmc.org.uk/ff/. In addition, the "Appeals" section of this Web site explains not only what the organization's latest conservation projects are, but also why these projects are needed.

Other sites of interest are:

Defenders of Wildlife: http://www.defenders.org/

References cited