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Issue 1. Should the Public Have to Pay to See the Results of Federally Funded Research? 2

YES: **Ralph Oman**, from testimony regarding H.R. 6845, the Fair Copyright in Research Works Act, before the Subcommittee on Courts, the Internet, and Intellectual Property of the Committee on the Judiciary (September 11, 2008) 6

NO: **Heather Dalterio Joseph**, from testimony regarding H.R. 6845, the Fair Copyright in Research Works Act, before the Subcommittee on Courts, the Internet, and Intellectual Property of the Committee on the Judiciary (September 11, 2008) 11

Attorney and past Register of Copyrights Ralph Oman contends that “If the NIH [National Institutes of Health] succeeds in putting all of the NIH-related peer-reviewed articles on its online database for free within one year of publication, the private publishers will be hard-pressed to survive.” Allowing private publishers to continue to profit by publishing the results of publically funded research is the best way to ensure public benefit. Heather Dalterio Joseph argues that permitting public access to NIH-funded research results does not threaten the viability of journal publishers. In addition, immediate online access to research results is invaluable to the public.

Issue 2. Should “Intelligent Design” Be Taught in Public Schools? 16

YES: **J. Scott Turner**, from “Signs of Design,” *The Christian Century* (June 12, 2007) 20

NO: **National Academy of Sciences and Institute of Medicine of the National Academies**, from *Science, Evolution, and Creationism* (National Academies Press, 2008) 26

Professor J. Scott Turner argues that the real issue is whether the world is purposeful. Intelligent design can in fact be usefully taught, and doing so avoids intrusions on academic freedom. The National Academy of Sciences and Institute of Medicine of the National Academies argue that evolution is so firmly enshrined in the foundations of modern science that nonscientific alternatives to evolution such as creationism (including intelligent design) have no place in the public school science curriculum.

Issue 3. Should the Internet Be Neutral? 34

YES: **Julius Genachowski**, from “Preserving a Free and Open Internet: A Platform for Innovation, Opportunity, and Prosperity,” speech at The Brookings Institution (September 21, 2009) 38

NO: **Kyle McSlarrow**, from “The Future of the Internet,” Testimony before the Senate Committee on Commerce, Science, and Transportation Hearing (April 22, 2008) 46

FCC Chairman Julius Genachowski argues that we must preserve the openness and freedom of the Internet to ensure that the Internet continues to support innovation, opportunity, economic growth, and democracy in the twenty-first century. Kyle McSlarrow, president and chief executive officer of the National Cable & Telecommunications Association, argues that “net neutrality” mandates would interfere with the ability of broadband providers to improve Internet access and thus would ultimately undermine consumer choice and welfare.

UNIT 2 ENERGY AND THE ENVIRONMENT 55

Issue 4. Is It Time to Think Seriously About “Climate Engineering”? 56

YES: **Kevin Bullis**, from “The Geoengineering Gambit,” *Technology Review* (January/February 2010) 60

NO: **James R. Fleming**, from “The Climate Engineers,” *The Wilson Quarterly* (Spring 2007) 67

Kevin Bullis, energy editor of *Technology Review*, reviews the latest thinking about “geoengineering” as a solution to the global warming problem, and concludes that despite potential side effects and the risk of unknown impacts on the environment, it may be time to consider technologies that can offset global warming. James R. Fleming, professor of science, technology, and society, argues that climate engineers fail to consider both the risks of unintended consequences to human life and political relationships and the ethics of the human relationship with nature.

Issue 5. Is It Time to Revive Nuclear Power? 78

YES: **Allison MacFarlane**, from “Nuclear Power: A Panacea for Future Energy Needs?” *Environment* (March/April 2010) 82

NO: **Kristin Shrader-Frechette**, from “Five Myths About Nuclear Energy,” *America* (June 23–30, 2008) 89

Allison MacFarlane argues that although nuclear power poses serious problems to be overcome, it “offers a potential avenue to significantly mitigate carbon dioxide emissions while still providing baseload power required in today’s world.” However, it will take many years to build the necessary number of new nuclear power plants. Professor Kristin Shrader-Frechette argues that nuclear power is one of the most impractical and risky of energy sources. Renewable energy sources such as wind and solar are a sounder choice.

Issue 6. Is America Ready for the Electric Car? 96

YES: Michael Horn, from “Roadmap to the Electric Car Economy,” *The Futurist* (April 2010) 99

NO: Rick Newman, from “A Stuttering Start for Electric Cars,” *U.S. News & World Report* (April 2010) 105

Michael Horn argues that the technology already exists to replace gasoline-burning cars with electric cars and thereby save money, reduce dependence on foreign oil sources, and reduce pollution. All we need is organization and determination. Rick Newman argues that because electric car technology is still new, expensive, and unreliable, it will be at least a decade before consumers are willing to shift from gas burners to electric cars.

UNIT 3 HUMAN HEALTH AND WELFARE 111**Issue 7. Do Falling Birth Rates Pose a Threat to Human Welfare? 112**

YES: Michael Meyer, et al., from “Birth Dearth,” *Newsweek* (September 27, 2004) 116

NO: Julia Whitty, from “The Last Taboo,” *Mother Jones* (May–June 2010) 122

Michael Meyer argues that when world population begins to decline after about 2050, economies will no longer continue to grow, government benefits will decline, young people will have to support an elderly population, and despite some environmental benefits, quality of life will suffer. Writer Julia Whitty argues that even though the topic of overpopulation has become unpopular, it is clear that we are already using the Earth’s resources faster than they can be replenished, and the only answer is to slow and eventually reverse population growth.

Issue 8. Is There Sufficient Scientific Evidence to Conclude That Cell Phones Cause Cancer? 135

YES: Olga V. Naidenko, from testimony before Senate Committee on Appropriations, Subcommittee on Labor, Health and Human Services, and Education, and Related Agencies, hearing on “The Health Effects of Cell Phone Use” (September 14, 2009) 139

NO: Linda S. Erdreich, from testimony before Senate Committee on Appropriations, Subcommittee on Labor, Health and Human Services, and Education, and Related Agencies, hearing on “The Health Effects of Cell Phone Use” (September 14, 2009) 144

Olga V. Naidenko argues that even though past research into the link between cell phones and cancer has produced ambiguous results, more recent research on people who have used cell phones for many years has produced more worrisome results. More research is needed, but concern is already amply justified, especially in connection with children’s exposure to cell phone emissions of radio waves. Linda S. Erdreich argues that independent scientific organizations have reviewed the research to date on the supposed link between cell phones and cancer and concluded that current evidence does not demonstrate that wireless phones cause cancer or have other adverse health effects.

Issue 9. Should DDT Be Banned Worldwide? 149

YES: Anne Platt McGinn, from “Malaria, Mosquitoes, and DDT,”
World Watch (May/June 2002) 153

NO: Donald R. Roberts, from “The Role of Science in
Environmental Policy-Making,” Statement before U.S.
Senate Committee on Environment & Public Works
(September 28, 2005) 161

Anne Platt McGinn, a senior researcher at the Worldwatch Institute, argues that although DDT is still used to fight malaria, there are other more effective and less environmentally harmful methods. She maintains that DDT should be banned or reserved for emergency use. Donald R. Roberts argues that the scientific evidence regarding the environmental hazards of DDT has been seriously misrepresented by antipesticide activists. The hazards of malaria are much greater and, properly used, DDT can prevent them and save lives.

Issue 10. Can Infectious Animal Diseases Be Studied Safely in Kansas? 171

YES: Bruce Knight, from “Statement on the National Bio- and
Agro-Defense Facility,” before the Subcommittee on Oversight
and Investigation, House Energy and Commerce Committee
(May 22, 2008) 174

NO: Ray L. Wulf, from “Written Testimony,” submitted for the
Record to the Subcommittee on Oversight and Investigation,
House Energy and Commerce Committee (May 22, 2008) 182

Bruce Knight argues that although the U.S. Department of Agriculture’s research facility at Plum Island, New York, has served well since it was built over half a century ago, modern technology is capable of ensuring safety at a mainland facility, which would also be cheaper to operate, more easily accessible, and more responsive to potential disease threats. Ray L. Wulf argues that an island location is much more effective at containing infectious diseases such as foot-and-mouth disease. A mainland research facility would permit unhampered spread of such diseases throughout the continental United States, with devastating consequences for the agricultural economy. Modern technology is not adequate to ensure safety, and federal, state, and local authorities are not prepared to deal with an outbreak.

Issue 11. Are Genetically Modified Foods Safe to Eat? 190

YES: Henry I. Miller and Gregory Conko, from “Scary Food,”
Policy Review (June/July 2006) 194

NO: Jeffrey M. Smith, from “Not in My Fridge!” *Ecologist*
(November 2007) 202

Henry I. Miller and Gregory Conko of the Hoover Institution argue that genetically modified (GM) crops are safer for the consumer and better for the environment than non-GM crops. Jeffrey M. Smith, director of the Institute for Responsible Technology and the Campaign for Healthier Eating in America, argues that GM foods are dangerous to health and should be removed from the marketplace.

UNIT 4 SPACE 211

Issue 12. Are We Doing Enough to Protect the Earth from Asteroid and Comet Impacts? 212

YES: J. Anthony Tyson, from “Near-Earth Objects (NEOs)—Status of the Survey Program and Review of NASA’s Report to Congress,” Testimony before the House Committee on Science and Technology, Subcommittee on Space and Aeronautics (November 8, 2007) 216

NO: Russell L. Schweickart, from *Asteroid Threats: A Call for Global Response* (Association of Space Explorers International Panel on Asteroid Threat Mitigation, September 25, 2008) 222

Physics professor J. Anthony Tyson argues that NASA can fulfill its congressionally mandated mission of surveying near-Earth objects (NEOs) that may pose future hazards to Earth by funding the proposed Large Synoptic Survey Telescope (LSST) project. Russell L. Schweickart, chair of the Association of Space Explorers International Panel on Asteroid Threat Mitigation, argues that to deal with the potential threat of asteroid and comet impacts, the United Nations must oversee an international effort not only to catalog potential threats but also to decide when and how to ward off potential impacts.

Issue 13. Will the Search for Extraterrestrial Life Ever Succeed? 231

YES: Seth Shostak, from “When Will We Detect the Extraterrestrials?” *Acta Astronautica* (August 2004) 235

NO: Peter Schenkel, from “SETI Requires a Skeptical Reappraisal,” *Skeptical Inquirer* (May/June 2006) 242

Radio astronomer and SETI (search for extraterrestrial intelligence) researcher Seth Shostak argues that if the assumptions behind the SETI are well grounded, signals of extraterrestrial origin will be detected soon, perhaps within the next generation. Peter Schenkel argues that SETI’s lack of success to date, coupled with the apparent uniqueness of Earth, suggests that intelligent life is probably rare in our galaxy and that the enthusiastic optimism of SETI proponents should be reined in.

Issue 14. Do Humans Belong in Space? 250

YES: Jeff Foust, from “The Future of Human Spaceflight: Are Astronauts Close to Extinction?” *Technology Review* (January/February 2010) 254

NO: Neil deGrasse Tyson, from “Delusions of Space Enthusiasts,” *Natural History* (November 2006) 257

Jeff Foust, editor and publisher of *The Space Review*, argues that the ultimate goal of manned space exploration is to “chart a path for human expansion into the solar system.” To support that goal will require extending the life of the International Space Station (ISS), providing more funding for mission development and encouraging the private sector to take over transportation to and from the ISS. At present, human spaceflight is not sustainable. Astronomer Neil deGrasse Tyson argues that large, expensive projects such as space exploration are driven only by war, greed, and the

celebration of power. The dream of colonizing space became a delusion as soon as we beat the Russians to the moon, and it remains so.

UNIT 5 THE COMPUTER REVOLUTION 265

Issue 15. Can Machines Be Conscious? 266

YES: Christof Koch and Giulio Tononi, from “Can Machines Be Conscious?” *IEEE Spectrum* (June 2008) 270

NO: John Horgan, from “The Consciousness Conundrum,” *IEEE Spectrum* (June 2008) 278

Christof Koch and Giulio Tononi argue that because consciousness is a natural phenomenon, it will eventually be artificially created. To test for such consciousness, however, will require something other than the classic Turing test. John Horgan argues that no one has the foggiest idea of what consciousness really is, and it seems highly unlikely that we will ever be able to create an artificial consciousness. “Engineers and scientists should be helping us face the world’s problems and find solutions to them, rather than indulging in escapist, pseudoscientific fantasies like the singularity.”

Issue 16. Do Government Internet Surveillance Efforts Threaten Privacy and Civil Rights? 287

YES: James A. Lewis, from “Cybersecurity: Next Steps to Protect Critical Infrastructure,” testimony before Senate Committee on Commerce, Science, and Transportation hearing (February 23, 2010) 291

NO: Amitai Etzioni, from “Are New Technologies the Enemy of Privacy?” *Knowledge Technology & Policy* (Summer 2007) 297

James A. Lewis of the Center for Strategic and International Studies argues that proposed legislation, The Cybersecurity Act of 2009, which calls for Internet surveillance without regard to other legal restrictions, is needed “to bring law to the Wild West” of the Internet and enhance Internet security. Amitai Etzioni argues that new technologies such as those that enable Internet monitoring pose new threats, in particular to privacy. If there must be government surveillance programs, there must also be mechanisms for oversight and accountability. However, the mechanisms of accountability must not lie solely in the hands of government.

Issue 17. Does Endorsing Open Source Software Fail to Respect Intellectual Property? 304

YES: International Intellectual Property Alliance (IIPA), from *Indonesia: 2010 Special 301 Report on Copyright Protection and Enforcement* (February 12, 2010) 308

NO: Michael Tiemann, from “The OSI Categorically Rejects IIPA’s Special Pleadings Against Open Source,” *Open Source Initiative* (May 3, 2010) 316

The International Intellectual Property Alliance (IIPA) argues that Indonesia should be put on the United States Trade Representative’s “Special 301” watchlist because, in part, Indonesia’s attempt to promote open source solutions “encourages a mindset that does not give due

consideration to the value of intellectual creations.” Michael Tiemann of Open Source Initiative objects strenuously, arguing that open source software is just as much an intellectual creation as proprietary software, it depends just as much on copyright protections, and because open source preferences have been promoted in several states, as well as portions of the federal government, the IIPA’s position amounts to an attack on the United States itself.

UNIT 6 ETHICS 325

Issue 18. Is “Animal Rights” Just Another Excuse for Terrorism? 326

YES: **John J. Miller**, from “In the Name of the Animals: America Faces a New Kind of Terrorism,” *National Review* (July 3, 2006) 330

NO: **Steven Best**, from “Dispatches from a Police State: Animal Rights in the Crosshairs of State Repression,” *International Journal of Inclusive Democracy* (January 2007) 335

Journalist John Miller argues that animal rights extremists have adopted terrorist tactics in their effort to stop the use of animals in scientific research. Because of the benefits of such research, if the terrorists win, everyone loses. Professor Steven Best argues that the new Animal Enterprise Protection Act is excessively broad and vague, imposes disproportionate penalties, endangers free speech, and detracts from prosecution of real terrorism. The animal liberation movement, on the other hand, is both a necessary effort to emancipate animals from human exploitation, and part of a larger resistance movement opposed to exploitation and hierarchies of any and all kinds.

Issue 19. Should We Reject the “Transhumanist” Goal of the Genetically, Electronically, and Mechanically Enhanced Human Being? 346

YES: **M. J. McNamee and S. D. Edwards**, from “Transhumanism, Medical Technology, and Slippery Slopes,” *Journal of Medical Ethics* (September 2006) 350

NO: **Maxwell J. Mehlman**, from “Biomedical Enhancements: Entering a New Era,” *Issues in Science and Technology* (Spring 2009) 362

M. J. McNamee and S. D. Edwards argue that the difficulty of showing that the human body *should* (rather than *can*) be enhanced in ways espoused by the transhumanists amounts to an objection to transhumanism. Maxwell J. Mehlman argues that the era of routine biomedical enhancements is coming. Since the technology cannot be banned, it must be regulated and even subsidized to ensure that it does not create an unfair society.

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