

**Keynote Address:
Green Campuses/Green Minds: Improving the 'still unlovely human
mind'**

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David Orr: John, thank you for those kind words. I'm very glad to be here especially after the plane ride last night. As we started to land in high winds at the Westchester Airport I noticed that the pilot was to my right and the runway was straight ahead. And that's not how you want these things to occur. So I was scrambling through my briefcase to find prayer beads or whatever solace might be available. We finally landed in Providence and I can say that it is very nice, indeed, to be here. But I missed hearing one of my heroes, Steve Curwood. "Living on Earth" has been one of the beacons of this movement. And for week after week, year by year, Steve has been one of the people who brought us good news, careful analysis, wider perspective. So Steve, thank you for what you've done so well for so long. I've been meaning to ask you though, the title, "Living on Earth," what's the alternative? Is there a planet Cheney or something else out there? Well, there isn't and that's actually good news. We'll have to learn, as you've said every week, to tend this one more carefully and more artfully.

I start this morning with a story of a recent interview of James Lovelock on the BBC. Lovelock is arguably the best independent scientist in the world, familiar to many of you as one of the two authors of the Gaia Hypothesis. In the spring of 2006 Lovelock published The Revenge of Gaia in which he argues that somewhere between 400 and 500 parts per million CO₂ in the atmosphere we will lose whatever control of the climate we may have. Our situation, he thinks, like being on a boat above Niagara Falls and with the engines about to fail. The BBC interview went something like this:

Interviewer: "James, it's so good to have you here. Tell us about your new book. Is there any hope for the human species?"

Lovelock: "Well, no."

Interviewer: "James, that is interesting. What will civilization be like in the year 2100?"

Lovelock: "Well, there won't be any."

Interviewer: "Oh, James, that is so interesting. How many people will be on earth in 2100?"

Lovelock: "Well, maybe about a half a billion." [You do the math].

Interviewer: "Well, James, it's been wonderful having you on the show. My guest next week will be..."

Disconnect! Everyone in the room has heard something similar in which otherwise well-educated and thoughtful people cannot hear and comprehend the science of climate change or fathom the complexities of the environment.

So the challenge of the Green Campus Movement is not just about recycling or energy efficiency, as important as these are. It is, rather, to lend ourselves fully to the effort to

overcome the disconnection between humankind and the natural world; to advance beyond our cultural autism. To this end we must aim to equip our students to comprehend complex problems and become problem solvers. A good starting point is to make all of our campuses laboratories for the study of solutions, places in which the rising generation of students acquire a sense of the real issues and more importantly how to roll up their sleeves and get down to work to make a better world than that in prospect. This movement is now at least 20 years old. But its roots are in the ancient Greek notion of Paideia and eventually in the philosophy of John Dewey, Alfred North Whitehead, Maria Montessori, and many others. But strictly speaking the green campus movement goes back only to the late 1980s and April Smith's Masters thesis ("Not in our Backyard") on the environmental impacts of UCLA in Los Angeles. In the same year (1987) I organized a study of the food system of Hendrix College. Later I extended this to examine food, energy, waste, water and materials flows on the Oberlin campus. In 1990 Tony Cortese introduced an effort to upgrade the ecological literacy of faculty at Tufts University. Julian Keniry organized the campus ecology program of the National Wildlife Federation in the early 1990s. Many of you in this room are now part of what has become a dynamic movement spreading across colleges and universities throughout the world. Have we done enough? No. Will we eventually be instrumental in building a world that works within the limits and laws of nature? I think so... but I also believe that it will be a close call.

I would like to reflect for a few minutes with you on how the parts of the campus greening movement might be joined into a larger whole aimed to connect our culture with the natural world. One part of the movement aims to reduce the environmental impacts of the physical operations by recycling and raising energy efficiency, and building high performance buildings. This is the physical side of the green campus movement. But there is another part that aims to improve the way people think. The former is a means to a larger end which is to improve what Aldo Leopold once called the 'still unlovely human mind.' What will we need to know in order to build a fair, decent, and durable presence in the world? By what curriculum do we join operations of the campus with education and research?

The picture on the screen is familiar to virtually everyone on Earth. It is the photograph of the Earth from the Apollo spacecraft—the first time that humans had seen the entire planet and the thin layer that we call the biosphere. We'd heard lots of warnings of ecological devastation, but I doubt that any of these or all of them together had a fraction of the emotional impact of this photograph just because of its stunning beauty against the black void of space. Perhaps it gave us a glimpse of what was at stake. But the warnings continue to come with greater urgency.

That given by the World Scientists (1992), or that by Martin Rees in a book called Our Final Hour (2003), and more recently in the Millennium Ecosystem Assessment Report (2005) say virtually the same thing. Our future is likely to be punctuated by "non-linear changes," in their words, by which they mean nasty surprises. The Millennium study is the largest scientific effort ever undertaken to appraise the ecological health of the planet, and the news isn't good. But the day this story appeared in the news it appeared in the

back pages in *The New York Times*. I do not recall that it made the evening news on ABC, NBC or CBS news, and it certainly did not make FOX news, an oxymoron. Instead the media was fixated on the story of Terri Schaivo. The media, so far, have done a thoroughly awful job on the issue of global warming where the evidence from those who study climate for a living has gotten progressively worse. Sea level rise, for example, is not likely to stop at one meter—the worst case presented in the third IPCC report. Melting of polar and Greenland ice is now known to be more rapid than previously estimated so oceans may rise as much as five or six meters flooding low lying areas around the Earth. We now know that the storms will be larger and perhaps more numerous as a result of global warming. We can reasonably expect that disease and famine will increase. The likelihood of severe heat waves and drought is increasing. Ecosystems are changing rather dramatically in many places around the world. Coral bleaching now afflicts about half of the oceanic corals, and that will increase. And climate change cannot be separated from politics, economics, and issues of security. Climate change is already taking a far higher toll on human life than terrorism. The World Health Organization estimates that the death toll from climate driven weather events is now about 150,000--a number that will rise over time.

The other side of the coin has to do with the sources of energy by which we power modern civilization. Our time will be but a small spike of fossil energy use in the larger span of world history. About 95 percent, I'm told, of the oil that has ever been burned has been burned in my lifetime. And if you're under 25 the number is still around 60 percent. But we are coming close to the peak of world oil extraction. On the screen is the curve of world oil extraction that draws from the pioneering work of M. King Hubbert in 1957. No one knows precisely when we will reach the peak. Goldman Sachs Inc. says it will be next year, Princeton geologist Kenneth Deffeyes says it was last year on Thanksgiving day at four o'clock. It will certainly occur certainly within the next five or ten years if it has not already occurred, but when we pass that peak of world oil extraction the gap between supply and demand will drive inflation, unemployment, oil wars, political turmoil, and worse. Coming up that left-hand leg of the slope has been a blast: it has been the age of human exuberance, rock and roll music, rapid economic growth, and all manner of things that we associate with the good life. British columnist George Monbiot says that we now live better than people have ever lived and better than people will ever live. Coming down the backside of the era of cheap portable fossil fuels will be a different story. The remaining oil on the planet is mostly deeper down, farther out, harder to refine, and located in places where people don't much like us.

Anthropogenic driven climate change and our overdependence on fossil energy reflects a prior disorder of thought, perception and values. The ecological crisis is a crisis of mind in every way. It is, therefore, a challenge to those institutions purporting to improve minds. This is a crises of education, not in education. Many of the problems that we face can be traced back to failures in education. But there are deeper explanations of why we ignore warnings that can be attributed to the power of denial. Ernest Becker's classic book, The Denial of Death, traces significant aspects of our behavior to our need to deny our own mortality. To the extent that that may be true, how much more would we want to deny the mortality of the conditions that allowed us as a species to flourish. Our own

history has a kind of built in optimism which can be perverted to simply dismiss anything resembling bad news. But perhaps the problem is not just denial but part of our difficulty comprehending things that are measured in parts per million or parts per billion. On the other hand we respond very well to direct physical threats. We are good at fighting wars, but have shown ourselves so far to be less adept at doing those things that involve foresight and good judgment of the sort necessary to the transition to sustainability. Maybe it's wishful thinking, maybe it's information overload, maybe it's the lack of information or maybe it's mass distraction. Compare our time, when the stakes now are literally global and permanent, with other times in history when people rose to do their duty. The Lincoln-Douglas Debates of 1868 stands as a notable example in our history of debate and discussion. I would be remiss to neglect the power of mass advertisement. Every one of us in this room have seen well over one million commercial advertisements and there's hardly a child anywhere that doesn't recognize the Coca Cola symbol or the Nike swoosh or the McDonald's logo. Future generations will wonder about the commercial silliness of our time as we confronted issues of climate change, energy issues, biotic impoverishment, population increase, human poverty, and security. On the screen is an advertisement for a Chevy truck that says "Hear that, it's the ground whimpering." But if someone needs to hear the ground whimper, what was their problem? And then there's this advertisement showing the rear end of a Hummer. The advertisement reads "when the asteroid hits and civilization crumbles you'll be ready." But ready for what? This thing gets ten feet per gallon, what are you ready to do? It's not all bad news, however. This is an advertisement from a company that calls itself Dolce & Gabbana. I don't know what they sell but they've put three free range chicks, a goat, and one chicken in a cage in the picture which is otherwise without explanation. They're obviously in the sustainable poultry business, maybe members of a local CSA. Advertising like this reflects a world made in large part by advertisers like Edward Bernays a world of mass manipulation and the "engineering of consent" as he put it. Could we turn that around?

This is my version of Abraham Maslow's triangle depicting the development of personal maturity. We all begin at the stage of infantile self gratification. But if our needs are met and we grow to a fuller stature we move up to self mastery, and self esteem, actualization, and a few of us may actually reach the highest level which he called transcendence. Advertising in a commercial culture, however, is aimed to keep us at the level of infantile self gratification. The effects of this organized effort to mutilate human potentials is perhaps reflected in data collected by Linda Sax's surveys of attitudes of college students which show that more college students want to be well off financially than to develop a meaningful philosophy of life. But it wasn't always this way. The challenge for those of us as teachers is to change these curves to enable our students to find meaningful lives and high purposes first.

The problem of advertising and human development in a commercial world is part of a larger problem involving a sea-change in the media. When Ben Bagdikian wrote his classic study of media monopoly in 1980 he complained that there were only 50 major media outlets. Now we're down to five. What comes to us as news is increasingly homogenized, sanitized, and trivialized. It's packaged to be kind of infotainment that falls

to the lowest common denominator of public taste. Those who bring us the news tend to come from very similar backgrounds: 92 percent of people in the three major news channels are white, 85 percent male, 75 percent republican.

In this setting communicating adequately about problems having to do with ecosystems, climate, or the broader issues of sustainability is difficult and becoming more so. Richard Louv, author of Last Child in the Woods, documents the fact that more children grow up indoors, watching television and computer screens, or spending large chunks of time in shopping malls. Fewer and fewer spend time out of doors. As a result they suffer what he calls “nature deficit disorder.” Extinction, as biologist Robert Pyle notes is not just about species but about our experience and consequently about our ability to experience nature. Humankind grew up in the Holocene, 10,000 years of geologic history in which climate was fairly stable and nature, if dangerous, it was still beautiful and fecund. But we are entering a different world, perhaps as James Hansen puts it, another planet. Climate change, if allowed to go too far, will make the nature we experience more fearful and much more capricious. Katrina scale storms, large droughts, heat waves, rising sea levels, and changing ecosystems will drive children away from nature altogether. On the left-hand side of the line on the screen, we are creating a virtual reality in which nature will be electronically contrived, packaged, and sold to us as entertainment.

Can we reverse these trends? I believe so but there is no time to lose. That brings me to the other part of my remarks having to do with institutional learning and education. The question is whether those institutions dedicated to learning can themselves learn; not relative to market share but to the way the world works as a biophysical system. What do the problems and dilemmas of climate change and biotic impoverishment, for example, have to do with institutional operations and curriculum? The figure on the screen shows the development of the larger movement behind this conference. I’ve described this as a progression through four quadrants divided by two axes representing the short-term/long-term and internal/external changes. The longer term goal requires a transformation depicted as the fourth quadrant in which our institutions become genuinely transformative. For instance might we join with organizations such as the US Green Building Council and the American Institute of Architects to advance the goal of carbon neutrality by 2030? Why not? Might that objective become an important part of our curriculum so that students understand the theory and practical aspects of solving the problems of climate change? Why not? To start can we incentivize energy efficiency on college campuses? If this sounds far-fetched, it isn’t. Many of you are doing such things already and doing it very well. Might our campuses function as laboratories for sustainability and for ecological design? Again, the answer is yes, and many of you are involved in doing that as well. Can we take a long term view of costs and benefits? We’re often told that green is a really good thing but too expensive. Could we change the way we make those calculations and include full, life-cycle costs of buildings and operations? Might this become an important part of the economics curriculum? Why not?

On the screen is the east side of the Adam Joseph Lewis Center at Oberlin College. It’s the first, as far as I know, entirely solar powered building on a US college campus. This is one of two photovoltaic arrays and that is our new U.S. Senator from Ohio, Sherrod

Brown. Could we power college campuses by a combination of efficiency, solar, and wind power? This is a wind field or wind farm near Bowling Green, Ohio that is performing above expectations and is commercially viable even in a state without great wind resource. Wind power is growing worldwide at ~40% per year and many of the Colleges represented in this room are beginning to buy green power.

But what do we do after we have a green campus? It's not enough, I think, to simply green operations and green facilities and build lots of LEED rated buildings. Still ahead is the improvement of that 'still unlovely human mind'. And that brings us to the questions about curriculum. How do we begin to reform institutions not just the physical facilities?

One is organize a jail break across disciplines. Open the doors, knock out the windows, break down the walls so that ideas flow more readily between what are often hermetically sealed disciplines. We're going to have to draw on every department and every discipline as we think our way through the transition to sustainability. That means dialog across disciplines, reward breadth and specialization. Increasingly academic rigor has been defined in ways that are almost indistinguishable from rigor mortis. Can we begin to define rigor to include so that specialized knowledge might co-exist with a broader kind of integrative intelligence or lateral rigor? Can we connect fields in different departments and disciplines? And could we allow faculty to do both in the course of an academic career? We demand that faculty publish incessantly, often the most trivial kind of gibberish. What about a rule that says you can't publish anything until you're 50. If you so much as write graffiti on a bathroom wall you're out of here. Go to Harvard or some other place, but you're out of here! Is it possible to reverse the kind of centripetal pressures that pull faculty into narrow specialization? Might we also include incentives that encourage faculty to work across boundaries to make connections and see the world as systems?

Taking this a step further can we modify the kinds of divisions that separate operations, curriculum and administration to build a genuine learning community? If we are to make college campuses creative laboratories for the important transitions we must make, we will need to reconsider the standard separations between operations and curriculum.

At a corporate planning meeting once the chief executive of the company said, "You know what's wrong with this company? . . . We suffer from a deficit of joy." The problem with the company, as he saw it, was not that they weren't making enough money, but something deeper. He described it by combining a spiritual word, joy, with an economic word, deficit, to say he wasn't having much fun. I think something similar is characteristic of many institutions of higher education. Could we change the way campuses work moving toward sustainability as something like a celebration or a party? John Cronin opened this session with a quote of mine saying that, "All education is environmental education." By what we include, by what we exclude we teach people they are a part of or a part from creation." Could we begin a different conversation that starts by asking about the purposes of the university relative to the issues of human survival? It has grown over the centuries into a strange conglomeration of different parts, rather like layers of archeological history representing different eras, concerns, and beliefs. Michael

M'Gonicle's Planet U describes the university as a unique hybrid: a corporation run by a board with a president as its chief executive officer; a bureaucracy modeled on late 19th century principals. It is time to rethink institutions of higher education. The U.S. auto industry stands as an example of the failure to rethink fundamentals of organization and product. Think of the conversations that must have occurred inside Toyota that lead to the Prius that didn't happen in General Motors while they were planning to make Hummers. Similarly what are the conversations that ought to be happening on college and university campuses now having to do with the overriding issue of human survival in the 21st century and beyond. The internet alone is changing how we work and how we ought to work. My point is to say that we will have to rethink and perhaps reinvent a great deal of higher education including the product we call curriculum. Thomas Berry in The Great Work, writes: "As now functioning the university prepares students for their role in extended human dominion over the natural world. So awesome is the devastation that we're bringing about that we can only conclude that we're caught in a severe cultural disorientation sustained intellectually by the university, economically by the corporation, spiritually by religious institutions." The starting point would be to question the financial underpinnings of education. Corporate funding and entire fields of knowledge are shaped, not just by intellectual curiosity or the advance of knowledge, but by corporate money. In 1985 total corporate giving to scientific research and university campuses was \$850 million. In 1995 it was \$4.25 billion and I guess that it is now perhaps as much as \$6 to 8 billion.

Derek Bok, former president of Harvard, believes that, "Universities may not yet be willing to trade all of their academic values for money, but they have proceeded much further down that road than they are generally willing to acknowledge." While we are at it, why not advance what is now a very muted conversation about the corporate domination of American society. In a decision in 1886 (Santa Clara County versus Pacific Railroad) the U.S. Supreme Court allegedly gave corporations the legal rights of persons. You and I are persons and we're mortal, we die, we can be in one place at one time, our assets are limited. But to say that corporations, like you and I, should have the right of freedom of speech and the right to life, liberty, property is a vastly different thing.

Institutions of higher education ought to be places where we talk about large issues. The photograph on the screen shows what's happening across 1.5 million acres of Appalachia. In our addiction to cheap electricity we leveled 456 mountains in one of the most diverse ecosystems in North America. The process called mountaintop removal removes the tops of mountains and dumps the "overburden" into valley. The result is permanent devastation of the land and the lives of people left behind. It is not simply wrong, but entirely unnecessary. Only three percent of our national electricity comes from West Virginia, and Kentucky, and Tennessee where mountaintop removal is now widely practiced. Why not a conversation about where we get our electricity a conversation about the rights of people in Appalachia and elsewhere that begins let's say with law schools, that extends through the whole curriculum.

On such issues we are often said to be divided between liberals and conservatives, left

and right. I don't think that's true. I think that you can be a liberal or a conservative and be opposed to mountaintop removal, ecological ruin, and injustice, and concerned about the long term human future. The real division is how we, in the present generation, relate to future generations.

The Constitution of the United States only mentions posterity in one place, and that's in the preamble. "We, the people of the United States, in order to form a more perfect union, establish justice, ensure domestic tranquility, provide for the common defense, promote the general welfare and secure the blessings of liberty to ourselves and our posterity do ordain and establish this Constitution of the United States of America." But after those words there is no case law that would give standing to future generations relative to our decisions that deprive them of life, liberty, and property. I propose that the green campus movement become part of a larger movement organized around the principle that no generation has the right to alter earth's natural cycles, or impair the stability, integrity and beauty of nature. The consequences of which would be a form of inner generational remote tyranny depriving all posterity of life, and liberty and property. The issues involved cross all discipline boundaries.

There are still harder questions ahead as we think about how to improve the 'still unlovely human mind'. That will require that we reconsider the larger topography of knowledge. The slide shows what is taken to be the general consensus that knowledge is merely cumulative progressing from ignorance to smartness. Every scholar adds their little brick to the wall of knowledge so that over the centuries we get smarter and smarter.

To a degree this is certainly true but it is more complex than that that simple model suggests. Differently conceived the slide shows a circle drawn around everything that we know. Outside that circumference is all that we do not know the unknown. As we learn more the circle expands, but so too the interface with ignorance. To illustrate, when Thomas Midgeley, Jr. invented chlorofluorocarbons, well the circle of knowledge grew as we now learned how to do something we didn't know how to do before. But ignorance grew as well; we didn't know what chlorofluorocarbons carbons do to the biosphere. That story could be multiplied endlessly. Bill Joy's article in *Wired Magazine* in April of 2000 ("Why the future doesn't need us") called for a moratorium on anything that we make that can self replicate on its own; specifically genetic engineering, artificial intelligence, and nanotechnology. Earlier, in 1978 Robert Sinsheimer a biologist and president of the University of California at Santa Cruz asked whether there is there or should be forbidden knowledge--knowledge that we could not handle responsibly. Joy and Sinsheimer noted that there are two ways to lose our tenure on the Earth: trash the planet and get ourselves evicted. The environmental movement is about the former Bill Joy and Robert Sinsheimer were warning about the latter. Whatever one's views on such things, this should have been part of a dialogue on every campus in the country. What is uncontrolled technological "progress" doing for our prospects?

The Green Campus Movement is a means to an end which is the improvement of what Leopold termed the 'still unlovely human mind'. Our progress ought to be measured against a very different standard which includes the rights of future generations to life,

liberty and property. In other words, they should have standing in our decisions about the large issues of sustainability that bear on their prospects. If we cannot have conversations like this in the academy, where will they occur? This is a conversation that is both interesting and portentous and it will not happen in the halls of Congress, or corporate board rooms, or on CNN. It will have to take place in colleges and universities.

For that conversation to have depth and breadth it will require a change in the goals of education. I propose simply that no student be permitted to graduate without knowing the laws of thermodynamics, or how the world works as a physical system. Nobody leaves a college education, in other words, as an ecological illiterate. No one should be given a degree who does not understand the first law of economics that we will pay for sustainability whether we get it or not. And we will pay in all kinds of ways. The people who die prematurely because of health impacts of unsustainable development will pay with their lives. All of us will pay in lost productivity, ideas, and lost opportunities. No one should leave four years of higher education without understanding that the environment isn't just item eight on a list but rather the principle that joins issues of economy, justice, security, and health together. Too often environmental studies is kind of like a little outshed built on behind the big house of the curriculum but it ought to be regarded as the core of the curriculum—the lynchpin that connects all departments and disciplines. Finally, every student should understand how the world works as a system with stocks, and flows, and leads, and lags, and feedback, and emergent properties and resilience. They should know, too, that when we don't understand how the world works, we can cause things to spiral out of control. But when we get them right, they can spiral in the other direction toward positive change and harmony.

We are at the most exciting point in human history and also the most dangerous-- caught between crisis and opportunity. And a good bit in the difference in those kinds of futures resides on our ability to understand how things work as systems.

The cartoon on the screen depicts a guy coming down the stairs, “My house is too big to heat, it's too far from work that I drive to in a car that's too large, fueled by gas that's too expensive, and the money just goes to terrorists who want to attack the way I live.” And then he concludes by saying, “I'm too tired for irony now.” Everything on that cartoon is part of a system. Paul Hawkins, Amory Lovins, and Hunter Lovins collaborated on a wonderful book called Natural Capitalism, and lays the foundation for systems solutions. We create, for example, 3200 pounds of waste for every pound of product on a store shelf. Can we design systems that don't create waste? We use 11 to 70 calories of fossil energy to put one calorie of food on the plate. We spend \$14,000 per second on military security. All of these as the authors of Natural Capitalism argue are design problems for which there are much better solutions. Ecological design aims to solve for pattern as Wendell Berry once put it. And that requires that we see these not as separate problems, but different aspects of one problem. The challenge before us is to design a world in which the parts fit together. Your challenge as teachers is to equip young people with the know how to design a sustainable world beginning with the transformation of college and university campuses. Thomas Berry calls this our Great Work. The problems listed on the screen appear to be beyond our abilities, but they are not any such thing. We know how

to power the world by sunlight, how to grow our food and fiber sustainably, how to build beautiful and decent cities, and how to create fairness and a decent future for everyone. We know that solving any one of those helps to solve the others. If we do make the transition to energy efficiency and renewable energy, for example, that will improve our foreign policy, our balance of payments problems, clean our air, improve the economy and improve our democracy.

And finally to you the challenge for you is how to design your life to fit the topography of the time. Can you make a life and career in solutions and ecological design? The slide is a list of careers, and you can make a much longer list. But education, ecological engineering, green architecture, ecological design, urban planning, industrial ecology and so forth. Whatever your interest and abilities take your primary interest and add the word environment or ecology in front of it, and join the global movement to transform the human prospect.

A story from my own campus. The picture shows three Oberlin students Josh, Naomi and Ben who've dedicated the past four years of their lives to raise \$17 million to build green mixed use building with apartments and businesses. The story has been featured in different media including the story on the screen from the real estate section of the New York Times about a month ago. These three didn't wait until they were 45 and accomplished at real estate design. They didn't go off to graduate school in real estate design, they simply went out and did it. As faculty members or administrators, our job is to equip you with the wherewithal and analytic abilities and the opportunities to similar kinds of things and get involved in the ecological enlightenment that will spread across this world over the next century.

I close with a thought from Albert Einstein. What's education for? Einstein's answer was very simple. "The task of education is to widen our circles of compassion. To embrace all living creatures and the whole of nature in its beauty." This is the ecological enlightenment. You are all a part of it. The institutions that have come together around this Consortium are a leading part of this in this part of the world. But this is happening all over. Join it, take it to the next level, because we still have yet, through this movement, to improve that 'still unlovely human mind'. Thank you very much.

John Cronin: We have time for about ten minutes of questions. David will give you concise answers, but you have to give concise questions. So go ahead.

Question: The green building at Oberlin is an example throughout the country. How much extra did it cost? How did you justify that to administration? And what benefits do you see, now that it is up, and are they finally getting in tune with the whole idea?

David Orr: Okay. We have until noon for this? [laughter] I just finished writing a book on the Lewis Center titled Design on the Edge (MIT Press, 2006). The total project costs for simply the building came in at \$7.2 million. I think the actual cost may have been lower. But taking out anomalies such as the living machine that processes wastewater, since most buildings do not have sewage treatment facilities, the project comes in at the high

end of average for a building of similar size, built at the same time in the same building market. If you change the question to ask whether it is possible to design high performance buildings at, near or even below the cost of conventional construction, the answer is yes. But, the focus on cost alone misleads because it does not include the collateral benefits. For the Lewis Center the side benefits were considerable. It attracted financial support and lots of good publicity. But best of all from my perspective was the educational benefits. We had, as an acre and a quarter laboratory for the study of some of the most important problems of sustainability. When Thoreau went to Walden he did so, he said, to drive some of the problems of living into a corner where he could study them. For a generation of students who've seen the world come undone. How do we get it back together again at a scale small enough to get their minds around, but big enough to be significant? Well, the Lewis Center has become a laboratory that includes a restored wetland, orchards, gardens, two different solar systems of power, a second building that's been remodeled to serve as a wet lab, water purification system, and a system that monitors building performance. Collateral benefits are sometimes hard to quantify but no less real nonetheless.

How has it impacted the college?

The impacts are mixed. I think students were affected most clearly. The administration was, frankly, slow to get it, but that is changing. The college has a pretty advanced environmental policy, a commitment to become climate neutral, and has hired a sustainability coordinator. Outside Oberlin the Lewis Center has had a major impact on several hundred building projects for which the Lewis Center was either the model or a major influence. But the impact on students is still the most impressive outcome from the effort. For example, 42 Oberlin students or alums attended the Atlanta USGBC meeting (2005). These included students who had worked in the design phase or taken classes in the building later. They are now out in the world making a difference and they know that the world is rich in possibilities and that we are not destined to end with a whimper or bang.

Question: What do you say about those who look at the video you cite about climate change and disruption and all these disturbing facts and say, "we are in the final days, there aren't going to be any more generations." It is a very persistent and very powerful toy for changing politics right now, and not only here but in the Islamic world as well.

David Orr: Yeah, the end times crowd. Well, you know, you can go to Rapture.org, I think, or Rapturenow.org website and you can see how close some think we are to the rapture. Seriously, one of the encouraging things of late is that many evangelicals have come onboard the climate change issue. For this growing number, the issue of climate change is a moral issue and consequently a matter of great concern to them. Pat Robertson, for example, is said to have done a 180 on the issue. A friend, Mary Evelyn Tucker, has assembled a remarkable series of papers on ecology and religion that draws together writings from the major world religions. The sum total is a remarkable testimony to the role that all faith traditions, at their best, can play. I highly recommend this series published by Harvard University Press. Carelessness toward the creation can no longer be

justified by adherents to any true religious tradition. It is a kind of mental aberration that will one day be regarded as criminal but we lack the words to describe how the survivors of the 21st century will see such behavior. What do we call people who knowingly take risks with the future of all life on the planet? Well, we don't have a word for that right now but we know that it fits no true religious tradition. None whatsoever. And I think our role is to say that loudly and clearly.

Question: About fifteen years ago you and [inaudible] sat me down with my friends, and this is why I'm sitting here today. What I want to say is not meant as disrespect but to show that you changed my career and my whole life. I have a problem with the talks of sustainability today. How do you ethically justify teaching what sustainability really is?

David Orr: First of all, I'm sorry for any bad impact I may have had on your career or life. [laughter] Thanks for the question. Two comments. It is time for a serious dialogue about sustainability. We sometimes assume that we are all in agreement about the definition. But I don't think so. There are real differences between how, say, Wendell Berry might define the word compared to Bill McDonough. I hope that a great deal of the effort to clarify sustainability and what we'll be required to do can occur as part of the movement represented in this room. One side has it that if we're just a little smarter we can make end runs around nature; have our cake and eat it too. On the other side Berry believes that we will have to live more poorly than we do. Between these two perspectives, I hope that we might start talking about serious issues with the kind of honesty shown by Winston Churchill in 1940. He offered, he said, only "blood, toil, tears and sweat." It's time for honest dialog.

Now, specifically the cost of buildings. In our case, first of all, you don't have to build green buildings expensively. There's enough data from 500 or 600 buildings to say with considerable confidence that it is possible to build green high performance buildings at, near or even perhaps below the cost of conventional construction. And by going green you do eliminate a lot of costs associated with heating, cooling, lighting, and maintenance while improving the productivity of people in the building.. An efficient building powered by sunlight needs a lot less HVAC equipment and the owner saves the purchase price of unnecessary equipment, operating and maintenance costs, and eventually the cost of replacement. Integrated design, competently done eliminates a lot of costs and amplifies other benefits. \$900 a square foot, no way, no how. The Lewis Center, as noted before, came in at the high end of average for comparable construction. Could we build the same building again more cheaply knowing what we now know? Absolutely. Now, the final point is that we're not going to build our way out of the mess we have gotten into. We've been digging ourselves into a very deep hole for at least a couple hundred years. Gary Snyder says it'll be a 1,000 year journey to climb out. I hope it's not that long, but it could be. But we're not going to build our way out of it. But to the extent that we have to build, can we build in ways that eliminate a lot of materials and all fossil energy eventually. That's the challenge Ed Mazria put before the AIA and the USGBC and they've accepted it.

Question: (inaudible)

David Orr: If I understand you correctly there are different strategies. But we are part of a revolution that's gaining steam. Everywhere I go I find exciting things happening at the community scale, at colleges and universities. The revolution is spreading to entire regions and states. California is leading the way on policy to stop climate change. Things are happening at the grass roots. But you are asking how do we organize this for a systemic revolution? Frankly, I don't know and I am not sure that one ever "organizes" a revolution. But let your imagination go . . . imagine a president of the United States coming in, in 2009, that gets it. And imagine what we might do to accelerate positive change in this country. To do that effectively will require that we understand how things work as systems and accurately identify leverage points in the system where small efforts can have very large positive results. Steve Curwood mentioned over breakfast this morning the possibility of giving preferential loans for carbon neutral housing. Well, wouldn't that be interesting? Think of a revolution in the design of communities so you don't have to move heavy things long distances. Major businesses are joining the effort to rethink commerce to eliminate fossil energy and waste. Does this make for a cultural revolution? I don't know, but I do know that something big is happening. Still, if you get real quiet you can hear on one side the four horseman of the apocalypse. So there is not a moment to lose. Urgency and all, I think we are witnessing a global ecological enlightenment—the counterpart of the enlightenment of the 18th century. We presently lack the kind of leadership in Washington that is absolutely necessary to do what we will have to do. But that will change before long. I think the public is close to the proverbial tipping point. I happen to think that the public is ready for the leadership that will enact a serious effort to stop climate change, shift to renewables, radically improve our energy efficiency, and end our military engagement in the Middle East. This is the challenge of our time. And if we fail I think Jim Lovelock's right, I think civilization hangs in the balance. But if we succeed, there will be a very different future for the human species.

One final point. The effort to build a decent and durable future ought to draw everyone together. These issues are not liberal or conservative but rather how this generation relates to its great grandchildren. Is there a right to life? Whatever you may think about abortion, we in the present generation hold the right of future generations to life, liberty, and property in our hands. Could we find common ground on the principle that life, now and that in the future has a claim on our affections, loyalties, and care? I think so. From that common ground could we find still higher ground? I know we can. I think that's where we're headed but we don't have a minute to lose. Thank you.

John Cronin: Now, our job here today is not just to complete a conference agenda. Our job here today is to be thinking about how we go forth from this conference. And following on David's words, we have the potential. We've started to put together the people, the energy and the institutions to create our own Green Campus Movement. But I want to stress something that David stressed, this is not just about bricks and mortar. This is not just about physical infrastructure. It's also about what we learn and what we teach and about the knowledge we acquire, and how we present that on our campuses and across institutions, and disciplines as well. And David mentioned Thomas Berry and his book The Great Work. One of the things that Thomas Berry says in his book, The Great

Work, and I recommend this book to all of you, is that some of civilization's most interesting, most creative, most hopeful eras have come out of its darkest eras. The other thing that Thomas Berry says in this book is that there is only one institution in society that has the critical capacity, the commitment to multiple disciplines, a purpose that includes commitment to community, and knowledge and understanding as its founding purposes. And higher education is that institution. It's the only institution that has those purposes. And the point he makes is that the future of the environment, the world environment, may very well lie in the hands of higher education. And if that institution can't accomplish it, then in fact the global environment really is in trouble. I want you to take that thought and that philosophy through the day with you and I want you to think about the next steps.

We have had the benefit very recently of some generosity from our outgoing governor. Governor Pataki has made available to us a \$750,000 grant to continue activities out of this conference. That is going to include a full time person for the next two years who is going to create an information center and a consulting center on green campuses. It's going to include a series of workshops on environmental compliance with environmental laws by campuses. Some of you may remember, and some of you are from schools who over recent years have gotten rated by the EPA and fined some very hefty fines. The third thing is curriculum development and interinstitutional development of programs so that we start talking about expertise and education and curriculum across institutions. And I don't mean to single people out. We have a lot of talented people here. But it is a shame that only people at Fordham have access to Roger Panetta. It is a shame that only people at Pace Law School have access to some of the best environmental policy and law professors in the country. We can change all that, and we can boost all of our curricular and all of our institutions by creating a new model. So what we want you to think as you go through this day, very specifically, is how should we spend this money. What are the things that you'd like to see on your campuses? What are the things that you'd like to see across campuses in the coming year, in the coming two years that can grow out of this conference? So I'd like you to take that as part of your mission, in addition to your mission of just learning over this next day of what we do going forth.

Thank you very much.