

To Believe or Not to Believe

By GARY CHILSON

To many, the idea that human activity could impact something as large and complex as the planet's climate seems ridiculous. But now we have gotten the word, and it is probably true. The world's top climatologists have tried, over and over, but they have been unable to disprove humanity's significant role in the increased levels of greenhouse gases in the atmosphere. The first report of the 4th Assessment of the Intergovernmental Panel on Climate Change, "The Physical Science Basis," released February 2, 2007, should put that aspect of the controversy to rest.

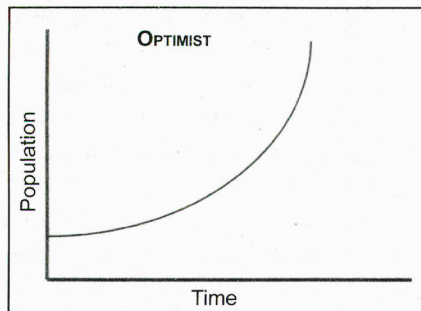
There are many who still prefer blinders [see "Why We See the Trees Instead of the Forest," *AJES* 13(1) 2006], but some are not surprised. Half a lifetime ago, graduate students like me were studying humanity's relationship with our environment and the other passengers on Spaceship Earth. It was pretty grim stuff, at times, because books like *The Limits to Growth*,¹ *An Inquiry into the Human Prospect*² and *A Blueprint for Survival*³ were among the things we read during the nation's first energy crisis. We worried about all sorts of threats to civilization including the rate of species extinction, air and water pollution, habitat destruction, human population growth and resource depletion. Conspicuously absent from my early education, looking back, was the existence of global threats like ozone holes and climate change—but their absence at the time does not change the conclusions we reached then, just the nature and scale of the mechanism that got us there.

To address our worries and confront our concerns, helping us to understand the larger social function of our chosen careers in natural resource management, my professor presented four distinctly different possible scenarios for our future, covering the rest of our lifetime and through our yet-unborn grandchildren's lives. Each scenario traced the possible

change in the size of the human population over the course of about 200 years. The biggest determining factor in the shape of the human population curve is civilization's interaction with the limits of planetary carrying capacity (k)—essentially the level of resource scarcity and the earth's absorptive capacity, given humanity's technology and productive ability, and resulting impact upon environmental resistance (which affects death and birth rates).

The Optimist's Scenario

The Optimist's scenario shows an upward growth in human population throughout the relevant time period because, in this scenario, the carrying capacity concept does not apply to humans—just to other species. To the Optimist, limits to our growth are not a concept of interest or concern because there are no limits to human ingenuity. Worries about exponential human population growth overshooting resource limits are shrugged off with the observation, backed by most of human history with only a few isolated exceptions like Easter Island, of the fact that technology always saves humanity in time. The mother of



invention, they point out, is necessity. Through the power of the market system, if a resource becomes scarce it becomes more expensive. That price signal would set in motion a search by producers for more of the resource because it would now be profitable, while at the same time consumers conserve their use of the resource because of its expense.

Eventually better alternatives are discovered, based on some new and abundant resource that makes the old, limited resource and technologies obsolete. My professor used the example of coal-fired electric power plants and Edison's wonderful light bulb replacing the nearly extinct whales and their expensive oil for lighting our homes and businesses.

I clearly remember Julian Simon's book, *The Ultimate Resource*,⁴ and its powerful argument for the Optimist's scenario. Basically, this perspective taught us that the world was unlimited; we would always discover another new technology to overcome resource limits when we needed it. There will still be oil in the ground when civilization no longer chooses to use oil because we will find something better and less expensive to power our machines.

This view, however, fails to take into account humanity's impact on the Others (the nonhuman passengers) on Spaceship Earth or, importantly, the possibility of limits to the planet's absorptive capacity. At the extreme, with this view, if the planet becomes an unlivable rock, we could simply abandon Spaceship Earth in lifeboats and settle on Mars before expanding further into the galaxy. Sustainability is not an issue in this "business as usual" Cornucopian dream unless it refers to a sustainable growth in human population, production and consumption.

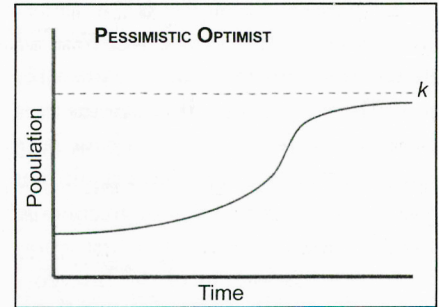
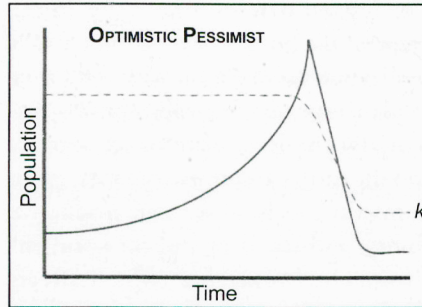
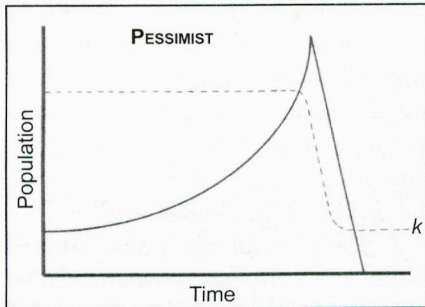
The Pessimist's Scenario

The Pessimist's scenario, on the other hand, is in stark contrast to the Optimist's because it assumes the existence of limits. In this neo-Malthusian nightmare, we ignore limits until too late and human population overshoots the planetary carrying capacity, then rapidly crashes to extinction—possibly within our yet-unborn grandchildren's lifetimes. This could happen, the Pessimists argue, because however powerful

economic forces are, there is an inevitable lag-time between the invention of another humanity-saving technology and its widespread use. One explanation for the nearly unimaginable possibility of human extinction is the use of biological

way to extinction. Like a World War II dive bomber, humanity somehow manages to pull out of its crash dive and levels off at some reduced population size that the, now significantly degraded, planet can support.

technologies are still introduced along the way, further reducing humanity's impact on the planet, enabling our human population and its demands to stabilize at a high level, perhaps as high as the 10 billion to 15 billion people projected



or nuclear weapons of mass destruction as different groups of people, such as the Haves and the Have-nots, fight resource wars over increasingly scarce resources, like water, energy, living space or food.

Another explanation for the crash to extinction is that human population growth, coupled with rising consumption and pollution, destroys the habitat of the other species necessary for the maintenance of Spaceship Earth's complex and still mysterious life-support system. Notable scientists, like E. O. Wilson, speak of the Sixth Mass Extinction period we are currently experiencing because of our habitat-destroying activities like destructive agricultural practices, mining and deforestation; fragmenting ecosystems; acid and mercury precipitation; and the global problems of invasive species, ozone holes and, now, climate change. Thus we might imagine the wretched poor of a dying Spaceship Earth attacking and destroying the lifeboats before some of the Haves can launch for Mars.

The Optimistic Pessimist's Scenario

The Optimistic Pessimist's scenario may seem more reasonable than either of the previous scenario extremes. It, too, assumes we disbelieve the existence of limits until too late, yet unlike the Pessimist's scenario, in which humanity overshoots and crashes to extinction, in this scenario humanity overshoots and crashes—but, optimistically, not all the

I have actually heard some discussion about the potential bright side of this future from fanatics (or the simply witless). The survivalist types are already prepared for this future, anarchists imagine a time without government (and civilization, I guess), and some radical greenies long for a return to the Neolithic culture of the Early Holocene, minus the scary human-eating predators, of course.

The Pessimistic Optimist's Scenario

The Pessimistic Optimist's scenario assumes limits exist but, unlike the previous Pessimistic and Optimistic Pessimist scenarios, we accept the existence of limits before it is too late and change our behavior accordingly—we gradually slow the growth of the human population and its demands on the planet and stabilize below its carrying capacity sometime within our grandchildren's lifetimes, presumably well before 2100. The pessimistic aspect here, in contrast to the Optimist's scenario, is the acceptance of limits—technology and the market are not enough to save us.

Rather than allow environmental resistance to control human destiny we choose to limit our pressure on the planet's absorptive capacity, limit our consumption of the planet's resources, limit our birth rate to be equal to or less than our death rate and we share space with the Others on Spaceship Earth. Nevertheless, we continue to use the power of the market and marvelous new

by mid-century, with all the benefits of a large global civilization. We achieve a sustainable civilization with peace and prosperity for all.

Pascal's Wager

The first three scenarios are based on a "business as usual" approach to our future that either succeeds because limits don't exist (the Optimist's scenario) or fails because limits do exist but are ignored until too late. Only the Pessimistic Optimist's scenario accepts limits as an organizing "precautionary" principle for civilization's future. How then should we think about the possibility of limits when the existence or nonexistence of a planetary carrying capacity cannot be proven until it is too late?

In the course I teach on sustainable development at Paul Smith's College, I address this appropriate skepticism with a secular version of a wager described by the seventeenth-century French scientist and philosopher Blaise Pascal. Essentially, Pascal's Wager is about whether or not one should believe in God—another example of an existence that cannot be proven until too late. I substitute the existence of limits (the planetary carrying capacity) for God and ask whether or not one should believe in limits despite the lack of definite proof. In this version, the existence of limits is either true or false and one can either believe in limits or not.

Not believing in limits would result in behaviors based on that belief. We

would produce, consume and pollute the planet as we currently do as if the day after tomorrow never comes. If you do not believe in limits and limits do not exist, as Julian Simon insisted, then business as usual, pursuing the Optimist's scenario, makes good sense. But there really is only a 25 percent probability of winning humanity's bet with this choice. Should we not believe in limits and limits actually do exist, then there is a 25 percent probability of going to hell, figuratively speaking—either the Pessimist's crash to extinction or the Optimistic Pessimist's return to a New Stone Age.

On the other hand, if we believe in limits we would behave accordingly and seek to live within those limits, striving to protect the planet's life-support system and enhance our lives within those limits through environmentally protective policies and behaviors and with technologies that promote energy and material efficiencies. Following the precautionary principle and if limits actually do exist (a 25 percent probability), we would win by achieving the Pessimistic Optimist's scenario of a sustainable civilization at a high standard of living for us all, humans and Others alike. If we were wrong about the existence of limits, also a 25 percent probability, yet we live as if they do, we still win with achieving a high civilization that respects the rights of Others to exist and no irreversible harm is done because, with our wonderful inventiveness, we could still increase our consumption and production later, if desired.

Believing in limits, like believing in God and living a wholesome life, would result in a good outcome regardless of whether limits actually exist or not. Efforts to achieve the Demographic Transition, to slow humanity's global birth rate, require programs and policies that promote empowerment and inter- and intragenerational equity. To further reduce our impact on Others and Spaceship Earth we would also promote and enhance the ecological integrity of ecosystems and achieve the maximum material cycling capacity of our society through

economic efficiency with true-cost pricing. Importantly, we would end our reliance on fossil fuels, relying instead on renewable energy sources and energy efficiency, eliminating what has become one of the most intensely destructive and polluting activities known to man.

The long and short of it is that not believing in limits gives us only a 25 percent chance of getting away with it. Skepticism about the existence of limits just is not a good bet.

Sustainability, Global Warming, and Protected Areas

Thirty years ago, the limits of the planetary carrying capacity still seemed remote and threats to our life-support system seemed manageable. As resource managers, we realized our task would be difficult but not impossible. The role of natural resources, processes and the non-human passengers on the planet would be considered crucial to the survival and prosperity of us all. We had our mission and goals to accomplish, and I believe we achieved much of what we hoped to accomplish over the past three decades despite the serious political mistake we made in our initial approach—reliance upon command-and-control techniques. Now all that has been accomplished is beginning to look "too little, too late" and we must also contend with politically powerful anti-environmental groups we inadvertently helped to establish.

The second report of the 4th Assessment of the Intergovernmental Panel on Climate Change, "Impacts, Adaptation and Vulnerability," to be released April 6, 2007, is expected to describe the variety of impacts resulting from the projected global warming. Much of what is to be reported by this scientifically cautious body is already in the public domain. For example, what we have from Al Gore's Oscar winning documentary, "An Inconvenient Truth," is a further melting of ice caps, glaciers and the collapse of more ice shelves, coupled with a further expansion of the oceans as they warm—which means rising sea levels. Even sooner, if not already experienced,

additional heat in the atmosphere should increase the frequency and severity of storm systems as well as significantly shift current precipitation patterns. Thus, storm surges can be expected to flood densely populated coastal areas and submerge low-lying island nations. What are now productive agricultural areas may become deserts. The environmental refugee problems these impacts pose, both within nations and between nations, would be immense. Perhaps, in some respects, the massive loss of biodiversity we can expect in the process will actually be the least of our more immediate humanitarian problems as global climate change progresses.

Fortunately, now even an Optimist like George W. Bush has admitted to the challenge of global climate change.⁵ The third report of the 4th Assessment of the Intergovernmental Panel on Climate Change, entitled "Mitigation of Climate Change," to be released May 4, 2007, is expected to focus on quickly reducing civilization's reliance on fossil fuels and expanding the world's forests, an important method of sequestering carbon dioxide. It is a start, but I propose we go further and accept a belief in limits and act accordingly to transform civilization.

It has been 45 years since Rachel Carson raised the specter of a silent spring and sounded the alarm, warning us of humanity's hubris and the precarious balance of nature. Thirty long years later, then-Senator Al Gore wrote in *Earth in the Balance*, "We must make the rescue of the environment the central organizing principle for civilization."⁶ Sometime very soon we must choose our future; either we bet on business as usual and hope for the Optimist's vision of a limitless world or we take the better odds, accepting a belief in limits, and transform our economy to achieve a sustainable civilization. It is time to choose: to believe or not to believe.

But what does it mean to us here in the Adirondacks? Beyond just believing in limits, what should we actually do to work more effectively? I am looking forward to the 14th Annual Conference

PREROGATIVE

on the Adirondacks this May 2007, sponsored by the Adirondack Research Consortium (ARC) and the Natural History Museum of the Adirondacks (The Wild Center). The theme of the conference is "Sustainability, Global Warming, and Protected Areas" with the purpose, among other things, of establishing a practical research agenda for the protected area of New York's North Country—the primary repository of biodiversity in the Northern Forest and an important node in the wildlife corridor, or Nature's emergency escape route, north to Algonquin Park in Canada. The protected areas of the planet, like our Champlain-Adirondack Biosphere Reserve, are the few remaining ecologically intact natural communities left to help us learn how to maintain and enhance

the life-support system of the planet in balance with our liberty-loving human communities.

One important outcome we hope to achieve at the conference is the establishment of an ARC-led taskforce to develop a regional research-based strategic plan for addressing climate change, reducing its negative impacts and enhancing our Adirondack communities—both human and wild. All of us can appreciate the difficulty of bringing research producers, like natural, political and social scientists, together with those who need pragmatic answers to practical questions—research consumers, like elected officials, regulatory agencies, land-use managers, advocacy groups, developers and businesspeople. This process of

improving communication to focus research on our practical questions in the region is one of the most important tasks to be accomplished.

Notes

¹Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, and William W. Behrens III. 1972. *The Limits to Growth*. New York: Universe Books.

²Robert L. Heilbroner. 1974. *An Inquiry into the Human Prospect*. New York: W. W. Norton.

³Edward Goldsmith et al. 1972. Blueprint for Survival, *Ecologist* 2(1).

⁴Julian L. Simon. 1981. *The Ultimate Resource*. New Jersey: Princeton University Press.

⁵George W. Bush. 2007, January. State of the Union Address.

⁶Al Gore. 1992. *Earth in the Balance*. New York: Houghton Mifflin.

CORRECTION

A Case Study of Breeding Birds in Northern New York State, AJES 13(2) 2006 p. 31 Addendum for Figure 2

By PETER A. QUINBY

For six of the 11 guilds that were more abundant inside the corridor, at least 50% of their species are known associates of mature and old-growth (M&OG) forest including the finches and old world sparrows; thrushes; wood warblers; chickadees, nuthatches, tanagers, cardinals and allies; wrens, kinglets, gnatcatchers, shrikes and vireos; and woodpeckers (Fig. 2). For the three guilds that are more abundant outside the corridor, only the birds of prey and fowl-like species guild had a high percentage of M&OG forest associates (65%; Fig. 2). Two of the three guilds that are more abundant outside the corridor are composed of birds associated primarily with aquatic habitats.

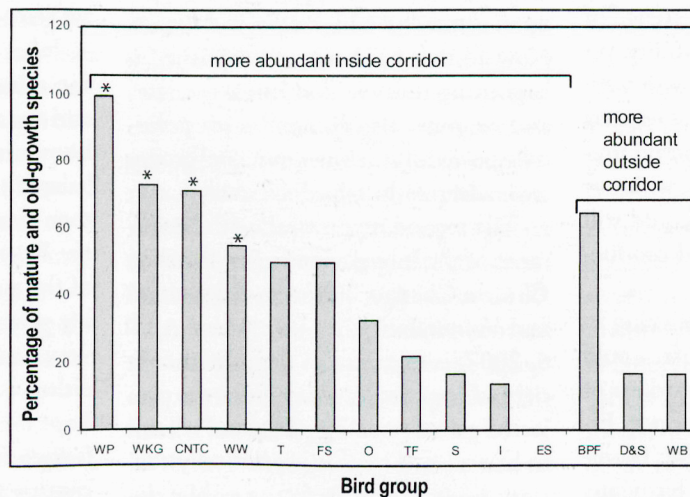


Figure 2. Percentage of bird species associated with mature and old-growth forests within 14 bird guilds in the New York portion of the A2A corridor area (* = $p < .05$, see Table 2)

LEGEND

- WP woodpeckers
- WKG wrens, kinglets, gnatcatchers, shrikes and vireos
- CNTC chickadees, nuthatches, tanagers, cardinals, and allies
- WW wood warblers
- T thrushes
- FS finches and old-world sparrows
- O others
- TF tryant flycatchers
- S swallows
- I icterids
- ES emberizine sparrows and allies
- BPF birds of prey and fowl-like spp.
- D&S ducks, ducklike birds and swimming birds
- WB wading birds