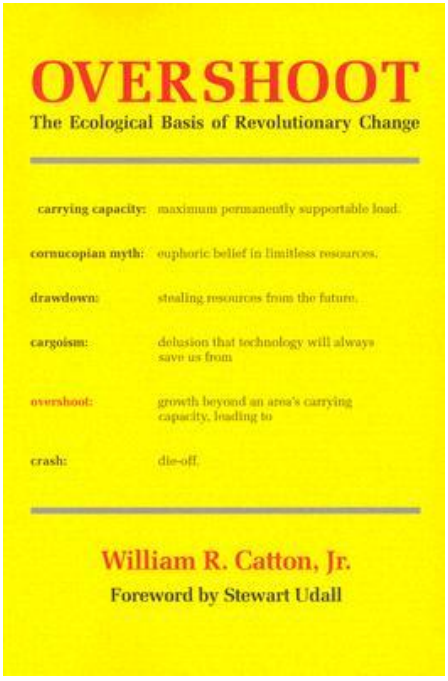

Overshoot: The Ecological Basis of Revolutionary Change

William R. Catton Jr. , Stewart L. Udall (Foreword)

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Guy says

Impressive. For the clarity and consistency of his ecological thought, and even more so given that the book was first published in 1980 when even among green activists and academics there was only a fuzzy understanding of the nature and depth of the ecological predicament created by our industrial civilization. For that matter, even now there probably aren't more than 5% of the population of the US who would really understand his worldview.

Catton gets so many things right that it feels a bit like nitpicking to note that he doesn't understand either wind or solar power (and thus comes down against them), and that he didn't foresee the vast strides science and technology would take in the next 30 years (thus creating opportunities to sustainably maintain a high level of civilization).

But he absolutely nails the basic issues of carrying capacity, the unsustainability of a fossil-fuel-driven economy, and the various types of reactions that people would have to the news that there are not only limits to growth but that we have overshot them and have thus set ourselves up for a possibly civilization-ending crash (said reactions ranging from ostrichism, through cosmeticism and the wonderfull named cargoism, to realism).

One of the most interesting parts of the book for me was when Catton described what it was like to live through the first oil shock... and analyzes people's reactions from an ecological perspective. Spooky... it felt like I was reading an account of our own future. And all the more frustrating therefore that this book was largely ignored for so many years during which we (the Western world) could have been doing things that would have allowed us, if not to completely avoid the coming die-off, at least to minimize its severity and impact.

Richard Reese says

William Catton’s book, Overshoot, describes the process by which most modern societies have achieved overshoot — a population in excess of the permanent carrying capacity of the habitat. It examines the long human saga, and reveals embarrassing failures of foresight that make our big brains wince and blush. Catton drives an iron stake through the heart of our goofy worldview — the myths, fantasies, and illusions of progress. Readers are served a generous full strength dose of ecological reality with no sugar coating.

Humans evolved to thrive in a tropical wilderness. In the early days, we lived lightly, like bonobos, in a simple manner that supported a modest population density. As the millennia passed, we learned how to increase carrying capacity by adopting ever-more-clever technology, like spears, bows and arrows, and fire — better tools, more food. This was a blind leap into the unknown. It pushed us out of evolution’s safety net, and required us to create cultural safety nets, based on enlightened self-restraint. Our path became slippery.

Much later, we slipped into soil mining — agriculture — which sent our carrying capacity into the stratosphere — temporarily. Topsoil is created over geological time. From a human timeframe, it is a nonrenewable resource. Soil mining often leads to water mining and forest mining. It has a long history of

spurring population growth, bloody conflict, and permanent damage to ecosystems.

Then, we slipped into metal making, and invented many new tools for raising carrying capacity even higher. This was a big fork in the path. Up to this point, we increased carrying capacity by takeover, expanding into new habitat and pushing out other species. Now, we added drawdown to the game, by tapping into finite nonrenewable resources, and becoming heavily addicted to them.

When communities lived with enlightened self-restraint, salmon and bison could be renewable sources of food for tens of thousands of years, or more. Iron, oil, and topsoil are not renewable. Their extraction does not contribute to the real carrying capacity of the habitat. What they provide is phantom carrying capacity, a boost that can only be temporary.

A habitat's carrying capacity is limited by the least abundant necessity. The limiting factor was usually food, but it can also be water or oil. Writing in the late 1970s, Catton perceived that 90 percent of humankind was dependent for survival on phantom carrying capacity. Today, that figure is certainly higher, with billions of people dependent on oil-powered agriculture and market systems. As the rate of oil extraction declines in the coming decades, there will be many growling tummies.

Columbus alerted Europeans to the existence of an unknown hemisphere, the Americas. This "New World" was fully occupied by Stone Age nations that survived by low-tech hunting, fishing, foraging, and organic soil mining. They had no wheels, metal tools, or domesticated livestock. European colonists, with their state of the art technology, vigorously converted wilderness into private property devoted to the production of food and commodities for humans. This greatly expanded the carrying capacity of the Americas (for humans). Colonists exported lots of food to Europe, and population exploded on both sides of the Atlantic.

A bit later, we developed a tragic addiction to fossil fuels, which led to the Industrial Revolution. We began extracting solar energy that had been safely stored underground for millions of years. Cool new machines allowed us to expand cropland, increase farm productivity, and keep growing numbers of people well fed. The population of hunter-gatherers grew 0.09% per generation. With the shift to agriculture, population grew 0.78% per generation. Since 1865, it's growing 27.5% per generation.

For four centuries, much of the world experienced a ridiculously abnormal era of innovation, growth, and excess — the Age of Exuberance. This created a state of mind that perceived high waste living as normal, and expected it continue forever. We were proud that our children would be able to live even more destructively than we could. Our glorious leaders worked tirelessly to increase drawdown and worsen overshoot.

We have no limits. We'll grow like crazy until the sun burns out. This is known as the cornucopian paradigm. Cornucopians hallucinate that withdrawals from finite nonrenewable savings are income, and that wealth can be increased by withdrawing even more nonrenewable savings. Cornucopians proudly refer to overshoot as progress. Ecology, on the other hand, insists that our ability to survive above carrying capacity, in overshoot, can only be temporary. We can refuse to believe in limits, but limits don't care if we believe in them.

The Age of Exuberance was brought to an end by the oil shocks of the 1970s. Our poor children now have a bleak future, a sickening descent into primitive barbarism — no SUVs, ATVs, RVs, PWCs, or McMansions. It was fun having the wonders of industrial society, like bicycles, metal pots, books, and running water. But these luxuries were provided by a system that has been surviving for 200 years on an exponential drawdown of nonrenewable resources. It's a way of life that survives by burning up posterity's savings. Catton warned

us, “It was thus becoming apparent that nature must, in the not far distant future, institute bankruptcy proceedings against industrial civilization, and perhaps against the standing crop of human flesh.”

Sadly, the consumer hordes can’t wrap their heads around the notion that the Age of Exuberance is over. Yes, things are a bit rough now, but recovery is just around the corner, probably tomorrow. The crazy cornucopian pipedream has become the primary worldview in most societies. It is still injected into the brains of every student, numbing the lobes related to enlightened self-restraint, often permanently.

We become anxious and angry as we slip and slide into more and more limits. Catton noted that a worrisome reaction to this is to blame someone, to identify scapegoats, hate them, and kill them — but this is pointless. “The end of exuberance was the summary result of all our separate and innocent decisions to have a baby, to trade a horse for a tractor, to avoid illness by getting vaccinated, to move from a farm to a city, to live in a heated home, to buy a family automobile and not depend on public transit, to specialize, exchange, and thereby prosper.”

While Catton was writing, 40 years ago, a new paradigm was beginning to appear on the radar — the ecological paradigm. This rational mindset made it easy to understand our predicament, and to envision intelligent responses, but probably not brilliant solutions. Society is not rushing to embrace the ecological paradigm, because any mention of limits is still pure heresy to the dominant paradigm.

Ecology is not titillating infantile twaddle created by big city marketing nitwits trying to sell you the keys to a treadmill way of life. It’s as real as life and death. In the game of ecology, there is no “get out of overshoot free” card. There is no undo command. The cost of overshoot is die-off, an unpleasant return to carrying capacity. After the fever comes the healing. This is an essential book for animals younger than 100 years old.

Ryan says

I can feel this book’s silent influence everywhere I look — alas that it weren’t twice as loud!

Rui Santos says

Read this book as part of my recommended reading list for an online course I'm undertaking with the Post Carbon Institute.

The book was bold and challenging in its ideas but I can't say very enjoyable to read. But it met its the primary goal to inform and educate the reader about the urgent need for revolutionary change in our thinking and approach to our relationship with nature if we are to continue to enjoy a habitable planet in the near future.

Zack Lehtinen says

This is easily among the top five most important and compelling books I've ever read. I almost qualified that as "nonfiction books," but the sentence stands as true without the modifier, and I cannot record this book

highly enough to everyone.

Catton recent passed. He had a long life, relatively speaking, and I hope it was happy. He was certainly one of the most important, eloquent (and unfortunately little-known or appreciated) voices of the past century. RIP, and may your legacy have greater, necessary impact than it was allowed in your lifetime, great Elder!

Natasha Hurley-Walker says

Brilliant but devastating. Anyone who thinks we're going to technologically solve the problems that face humanity really needs to give this a read.

I read Too Smart for Our Own Good a few years ago and that was almost reassuring, because I felt relieved that someone was at last looking seriously at the issues. Now I've read Overshoot and I have a horrible sinking feeling... it was published in 1982. People have been trying to raise awareness about these issues since before I was born. And almost no one has been willing to listen. Including myself (I'm not cancelling all my flights), and the author (drove everywhere unrepentant), and pretty much everyone I know (well except the mums at daycare that drive SUVs; they can go die in a fire -- oh no wait, they don't need to, all our descendants will!).

Well-meaning and well-informed we may be, but human we all still are, and that means working in the best niche we can find for ourselves, and looking after our friends and family. Turns out that may mean complete environmental devastation, and (spoiler for the second-to-last chapter) possibly even a nightmarish *simplification* of world ecosystems, condemning our descendants to yo-yo in population like lemmings. (I suspect that it's more likely we'll re-commence strict population control measures like the Aztecs' ritual infanticide. Yay, humans...)

But that's not the worst part. First we will find out what happens to the 99% of us who cannot survive on what remains of the Earth's renewable resources, once we've finished (politically or physically) drawing down what we will of the non-renewables.

This book gets five stars for being so totally clear and convincing about it.

Chris Chester says

tl;dr Fossil fuels have enabled man to greatly exceed the carrying capacity of the Earth, but since they are finite, population crash is inevitable. It's biology, and there's no technological deus ex machina coming that can help us escape it.

Modern man no longer belongs to the species *Homo sapiens*, argues William Catton in this remarkably prescient work published back in 1982, but to a species more aptly named energy-gobbling monster *Homo colossus*. Leaning on the same mindsets that freed (some) men from privations of hunger, humanity discovered and then came to rely on sources of energy that are by their very nature temporary. The consequence is that we are not only well beyond the sustainable carrying capacity of the planet, but are

actively undermining that capacity for future generations in our zest to maintain the impossible.

How did we get here? It's not a moral failing, Catton argues, but a natural consequence of man's propensity for utilizing tools. Time and again, our advanced simian brains have allowed us to exceed the normal carrying capacity of our habitat by leaning on "ghost acreage" — resources that go beyond the limits of our immediate area. From the discovery of fire to the domestication of beasts of burden, to agriculture, we have found ways to exceed the limits that nature would otherwise place on us. Those increases have come at the expense of other species, but they were for the most part stable.

That condition has been amplified in the last two centuries, however, since we have discovered how to use the accumulated sunlight energy buried under the ground millions of years ago during the Carboniferous period. Read: fossil fuels. If we were to rely on the sustainable energy provided by the earth alone, we would need an additional 9 more earths to make up the surplus we were spending in **1982.** And because fossil fuels are by their nature finite, the world we've built under the assumption that this energy is always going to be there is unsustainable. It can't last. And that means our population numbers and our standard of living are temporary. A crash is inevitable.

Maybe I should rephrase that, because the argument isn't that this lies in the future. Catton argues that the history of the 20th century can be characterized ecologically as a pattern of mutual interference, an "elbowing and counter-elbowing" between groups for access to necessarily limited resources. Democratic institutions are apt during periods of abundance, but in times of resource crisis, violence and despotism follow, veiled as they are in familiar patterns of ethnic, religious, and ideological warfare. An enlightened ecological view takes some of the personal sting out of this process, but it does little relieve the underlying tension. And it's tension over limited resources that presages collapse.

So what are we supposed to do about it?

Catton explicitly tries to tamp down this kind of questioning, so typical of American social sciences. Instead he tries to focus the reader's attention back onto that sustainable carrying capacity that we exceeded so long ago. If we behave thoughtlessly, seeking to extend our standard of living as we're doing, the consequence for the biosphere is a potentially permanent reduction in carrying capacity for our descendants who survive the population crash. If we're going to do anything, it should be to preserve as best we can that underlying support structure nature has given us.

It's a sobering message, and a little depressing given the way the world has gone since this was written. Still, you have to give the man props for his prescience.

James says

Masterful. The author wrote this book in 1982, but a lot of it reads as if it was taken from last year's news. The basic theme is that this planet can only support a certain number of people (or any other creatures) indefinitely; there is a limit based on the renewable natural resources we consume and the rate at which they are regenerated by nature. By tapping into the reserves of fossil fuels that are leftovers from millions of years ago, the human species temporarily increased the limits, the amounts of resources available to feed us and power all our machines and other fuel-using technology, but this can only be done as long as we keep using more and more of those fossil fuels. Now we are starting to really feel the pain of those fossil fuel supplies running low on the one hand and the effects of our using them so extensively poisoning our environment and

changing the climate on the other hand.

I wish this book could be read and discussed by every high school and college student, every politician, and every voter. There is no doubt that life is going to keep getting harder and resources scarcer and spread more thinly; the challenge is to adapt to the process as effectively and with as much mutual respect, dignity, and humanity as we can.

Paula says

If you are completely uninformed about the fact that humanity is living beyond its means, then you may find some insight here. There is an old saying that a man with a hammer sees every problem as a nail. That is how Catton strikes me. His hammer is his obsessive idea that populations in nature that overshoot the ability of the environment to support them plunge into a rapid die off. Nor does he offer any solutions other than the warning that we're doomed--curtailed consumption or not. There are many books that cover the same information herein, with greater thoroughness and even some solutions. As an antidote to this depressing treatise, I recommend reading those first.

Rezl says

Catton's work is exceptionally well-written, compelling, and well-researched. He explains the greatest problems facing humanity as resulting from the collective absence of an ecological perspective and reluctance to face limits to growth.

This was still very difficult to read at times, simply in terms of it's overall density and my lack of a scientific or research background. Despite this, it offered many fascinating examples and perspectives relating to general ecology and their applications to the human predicament.

Adam says

I've been reading books on “the Problem of Civilization” for several years now. I'm constantly seeking to refine my conceptualization of the way humans interact with each other and their environment. Contrary to what one reviewer says (that most of Catton's book is “common knowledge for any under-40 environmentalists”), I felt that Overshoot expanded my understanding of environmental issues as a whole more than any book I've ever read – excluding perhaps the big leap that occurred when I was first exposed to the issues – though the books I've been reading were all written 10 to 30 years after it.

Overshoot is a sober, no-nonsense, presentation of ecological facts about the human condition and civilization. There are absolutely no emotional appeals, no aesthetic arguments, and no moral claims distracting from the simple paradigmatic wisdom Catton is pushing. His project in the book is to incite a paradigm shift, in Thomas Kuhn's scientific-revolutionary sense. That Catton's ideas haven't become common knowledge for everyone under 40 who's been paying attention attests to the fact that cultural paradigms function differently than scientific paradigms. A scientific paradigm has inertia, certainly, but it does fold against the pressure of accumulating evidence it can't properly explain.

The cultural paradigm Catton refers to as Exuberance is so deeply entrenched in our culture that even now, 30 years after the release of the book, in an age glutted with environmental awareness and media, practically no one addresses the fundamental revelation Catton presents: that, by using non-renewable fossil fuels and minerals, we have overshot the carrying capacity we had cultivated and irreparably reduced the earth's capacity to sustain us. As fossil fuels, clean water, arable land, minerals, etc, are exhausted, we WILL experience an extremely unpleasant die-off, accompanied by a likely-total collapse of our civilization.

Speaking of paradigm shift, Catton quite handily put the final nail in the coffin of my old, ideological way of thinking, and confirmed my new (since about this time last year) paradigm. This paradigm refuses explanations for large-scale historical, economic, and social trends based on abstract, ideological factors and not on biological, anthropological, and geographical ones. Catton gave me a number of missing links in the exposition of such an understanding. For example, I'd long suspected there must be some physical causes underlying economic recessions and booms. Economic growth depends on wealth creation, and while that could theoretically occur merely from enhanced human innovation, in practice it obviously occurs by expanding our access to and consumption of physical resources.

Other reviewers have complained that Catton is “all problems, no solutions.” I found the way Catton did supply 'solutions' extremely interesting. He says, to paraphrase, 'The American response to any problem is to ask “What can we DO about it?” Instead we must ask “What can we AVOID doing to keep a bad situation from getting much worse?”' The potential carrying capacity of the Earth is a matter of theoretical debate. However, the extent to which we obviously depend on fossil fuels shows that we have definitely overshot our current carrying capacity. Some people believe technological solutions will be found to drastically increase permanent carrying capacity by the time oil runs out. Catton likens these people to the Cargo Cultists of Melanesia, acting out vain rituals to bring back prosperity the creation of which they never understood. Since we have overshot carrying capacity and are extremely unlikely to be able to raise it to a level that can support the population the world will have produced by the time oil runs out, we will necessarily experience a die-off. This is a problem for which there IS NO SOLUTION. What we could do now is to undergo a voluntary recession, reducing economic growth now in order to make the die-off more humane and possible to weather.

Unfortunately, our current economic and political situation make that possibility seem extremely unlikely. Global warming is one issue of overshoot – we have exceeded the capacity of the environment to process our CO2 output – and the way our political and economic leaders are handling that problem is not heartening.

I very much enjoyed Catton's glossary, and had a lot of fun imagining the visual images his terminology implies. Homo Colossus, a giant cyborg human with all these appliances manufacturing goods for him and refining ore he finds and generally performing in one self-contained apparatus all the functions we have a whole global economy spread across the world for. Or acres and acres of phantom fields worked by ghost slaves.

If there is a better introduction and explanation of the ecological history of civilization, I'm not aware of it. Overshoot is unemotional, very clear, and would a wonderful introduction to these issues. I think it would have been nice had parts of this been required reading for my Intro Environmental Science class rather than Hardin's shitty “Tragedy of the Commons” essay. Go on and read more modern books that tackle the issue from a different perspective once you've finished.

Jared Diamond's Collapse is a must-read presentation of the same argument through an abundance of historical and modern geography case studies. Derrick Jensen's Endgame takes a much more emotional point of view, but this is also an important perspective. Value judgments are crucial in making long-term human

policy decisions, just as they are in small-scale environmental and social issues. Don't bother with Quinn's Ishmael once you've read these three – it's a rather simplistic rehash of their concepts. Do read E.O. Wilson's The Diversity of Life, which makes emotional arguments about the intrinsic value and rights of biodiversity that are based on even more incontrovertible scientific arguments about the power biodiversity exerts in buffering our ecosystems from collapse.

Jamey says

I love this. The argumentation is excellent, and the implications are profound and dire. The anecdote about the reindeer on the island is worth the price of the book.

Yifan (Evan) Xu (Hsu) says

The title of the book "overshoot" gives me a straightforward impression that it is about the carrying capacity such as natural resources that would soon reach exhaustion. But the content of the book suggests otherwise.
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??The author believes that innovation of technology can provide substitutes to currently exhausting resources and expand the carrying capacity infinitely. His seemingly convincing argument that affirms the divinity of technology is a historical account. He says, in human history, we have been in situations where exhaustion of resources had arrived, but our advancement in technology saved our fates. Some good examples are discovery of fire, domestication of animals, crop cultivation, territorial expansion, invention of conventional medicine and industrial revolution relying on fossil fuels. Every time such technology breakthrough occurred, human populations and average living standards rebounded from decline due to reaching capacity limit and sustained an upward momentum for a long time. And from these past experiences, we can expect the same would happen to us again in the event of next capacity crisis.
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??So far so good?
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??Good. But please consider this: if what the author says is true, then we don't necessarily have to worry about global pollution, shrink of arable land, fossil fuel limits and global warming, because technology will eventually solve all these problems.
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??My first evaluation to author's position is absurdity. Land to expand is limited, so are natural resources; No one can make sure the benefit of future technologies outweigh their costs; And what occured in the past won't necessarily guarantee it will occur again. The Author's argument is a typical LSAT logical reasoning flaw.
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??However, after reading a few more supplementing sources, this criticism starts to shatter. For enhancement of arable land, deliberate implantation of certain microorganisms can repair soil that was once considered permanently damaged; for fuels, naturally produced synthetic fuels can replace fossil fuels to a certain extend, and the prospect looks promising; genetic engineering has already improved agricultural production, and it will further impact our human's physical conditions as well. Besides, solar power, nuclear fusion energy and many other alternative problem solving solutions all seem to support author's euphoric belief.
??
??The author advises at the end of the book that we should take the overshoot seriously and act to preserve

energy as well as protect environment regardless whether earth's capacity limit has been reached. Although the author's main point is cautiously accepted, his last view is an obvious truism. Optimism of the future never justifies lack of conservation at present. No matter what happens in the future, we still need to protect enviroment and save energy as these actions are duties inseparable from our moral sense.

Jeffrey Wong says

This is a test review

Jason says

Another reviewer has taken the words out of my mouth.

Catton's thesis, succinctly put:

> "Human beings, in two million years of cultural evolution, have several times succeeded in taking over additional portions of the earth's total life-supporting capacity, at the expense of other creatures. Each time, human population has increased. But man has now learned to rely on a technology that augments human carrying capacity in a necessarily temporary way--as temporary as the extension of life by eating the seeds needed to grow next year's food. Human population, organized into industrial societies and blind to the temporariness of carrying capacity supplements based on exhaustible resource dependence, responded by increasing more exuberantly than ever, even though this meant overshooting the number our planet could permanently support. Something akin to bankruptcy was the inevitable sequel." p.5

Something akin to bankruptcy, eh? Makes ya wonder if there isn't a connection between the debt crises currently encircling the world and human overshoot.

The challenge, as Catton sees it:

> "The paramount need of post-exuberant humanity is to remain human in the face of dehumanizing pressures. To do this we must learn somehow to base exuberance of spirit upon something more lasting than the expansive living that sustained it in the recent past. But, as if we were driving a car that has become stuck on a muddy road, we feel an urge to bear down harder than ever on the accelerator and to spin our wheels vigorously in an effort to power ourselves out of the quagmire. This reflect will only dig us in deeper. We have arrived at a point in history when counter-intuitive thoughtways are essential." p.7

> "Unless we discard our belief in limitlessness, all of us are in danger of becoming its victims." p.10

> "Desire changes entail unwarranted changes. Changed human activities involve changes in

man's environment. Environmental change leads to succession; it can threaten human life. Non-competitive human interaction is imperiled by excess numbers and proliferating technology. Ecological antagonism begets social and emotional antagonism. These [are] the principles people [need] to learn to read between the lines of the news in post-exuberant times." p. 208

[B]elieving crash can't happen to us is one reason why it will. The principles of ecology apply to all living things. By supposing that our humanity exempts us, we delude ourselves. It is not just the yeast cells we put into wine vats that bloom. It is not just the recognized detritovores that crash. We have been backing into the future with our eyes too firmly averted from the detritivorous nature of our modern lifestyle. It is time to turn around and see what's ahead." p. 213

"If, having overshot carrying capacity, we cannot avoid crash,perhaps with ecological understanding of its real causes we can remain human in circumstances that could otherwise tempt us to turn beastly. Clear knowledge may forestall misplaced resentment, thus enabling us to refrain from inflicting futile and unpardonable suffering upon each other." p.214

"Profound as it might seem by standards from the culture of exuberance, if the debate about how to cope with the future was going to resolve itself into merely an argument over how to 'produce' our way out of trouble, the essential nature of our predicament would be overlooked. As it has been necessary to say repeatedly already, overlooking that predicament could not protect us from it. What really needed to be discussed was not only the dire need to conserve resources, but also this: *What kind of role are human beings going to play in their own impending crash?* How much will our efforts to avoid the unavoidable make it worse?" p.231

"We must learn to *live within carrying capacity* without trying to enlarge it. We must *rely on renewable resources consumed no faster than at sustained yield rates.* The last best hope for mankind is ecological modesty." p.260

"Mankind is condemned to bet on an uncertain future. The stakes have become phenomenally high: affluence, equity, democracy, humane tolerance, peaceful coexistence between nations, races, sects, sexes, parties, all are in jeopardy. Ironically, the less hopeful we assume human prospects to be, the more likely we are to act in ways that will minimize the hardships ahead for our species. Ecological understanding of the human predicament indicates that we live in times when the American habit of responding to a problem by asking 'All right, now what do we *do* about it?' must be replaced by a different query that does not assume all problems are soluble: 'What must we *avoid* doing to keep from making a bad situation unnecessarily worse?'" p.262

"Our best bet is to act as if we believed we have already overshot, and do our best to ensure that the inevitable crash consists as little as possible of outright die-off of *Homo sapiens.* Instead, it should consist as far as possible of the chosen abandonment of those seductive values characteristic of *Homo colossus.* Indeed, renunciation of such values may be the main alternative to renewed indulgence in cruel genocide. If crash should prove to be avoidable after all, a global strategy of trying to moderate expected crash is the strategy most likely to avert it." p.266
