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INVITED ARTICLE

EDITOR'S NOTE

It has been said that "common sense is the least common of the senses." The paper below, written by Bruce Bridgeman, is about common sense in sustainable development; a refreshing contribution to an emerging discipline that needs to be liberated from obtuse models and terminologies that add little to the urgent task at hand. Bridgeman turns the question inside out: "what is truly unsustainable?" As a teacher who is experienced in making complex matters understandable, he shows that many things we take for granted are unsustainable. There are two ways out of unsustainability: mitigation and adaptation. Reducing unsustainable consumption of goods and services may buy some time. But mitigating extravagant consumption may not be enough: "too many of us living lightly on the earth will still destroy it." The transition from unsustainability to sustainability will probably require significant behavioral and cultural adaptations, especially in the "First World."

ABOUT THE AUTHOR

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What is Truly Unsustainable?

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We are concerned about our environment because we know that we have more people than the world can sustainability support, and that growth makes sustainability even more difficult. Sustainable practices are those that can be continued indefinitely without using up irreplaceable resources or harming the environment.

So what is sustainable in the long run? Recently I participated in an 'Earth Summit' at the University of California, Santa Cruz, with a lot of sincere people working to do right by the planet and by their descendants. Some of them came by car. But cars burn gasoline made from oil, and we're pumping oil out of the earth at a thousand barrels per second to meet the demand. Already we're seeing signs that the oil is beginning to run short. So the participation of those well-meaning drivers in our conference was not sustainable.

Other more eco-friendly people arrived by bus. They shared their ride, and diesels are more efficient than gasoline engines, so they got a lot more passenger miles per gallon, but it's still oil, and it will still run out. In the long run, not sustainable.

The most eco-friendly participants arrived by bicycle. They used their own sustainable muscle power to get there. But where did the muscle power come from? The cyclists ate a breakfast that was mostly not organic, because the world can no longer feed even half its population from organic farming. It was brought to them on trucks or trains, the last steps by truck. The orange juice came from Florida, three thousand miles away; the cereal came from the Midwest, a thousand miles; the milk from dairies a hundred miles away; the banana from Panama. So our cyclist's breakfast is like everything in the supermarket – everything, from the South African juice packs to the organic produce of farms fifty miles away. It's all delivered on oil-

burning trucks. Unsustainable.

What about the bicycle itself? It's powered by human muscle, but mine is made mostly of steel. It takes fossil fuel to mine the ore, to extract the metal, to roll the tubing. I could go on and on. Don't even think about 2000-pound automobiles compared to 20-pound bicycles. We can make good use of the bicycles we already have, but the process of making more is unsustainable.

At the conference we saw slides describing environmental problems and solutions. The projector, computer and loudspeakers ran on electricity. Is that sustainable? In Northern California about half of our electric power comes from non-fossil sources, mostly hydro and nuclear. Most of the world doesn't do even that well. (I'll call nuclear power sustainable because the world could exploit it for several centuries if we get desperate and start using breeder reactors.) So half the slide show was sustainable. The rest? Not sustainable.

At lunch I met a mother with three adorable children. If every couple had that many, our population would jump by half in a single generation. Each additional person demands more resources from a constant earth – more housing, water, food and the farmland needed to grow it, even fuel. Any family with more than two children is unsustainable, and any country with a growing population is in big trouble.

The Earth Summit served a nice lunch, all vegan and organic, grown without artificial fertilizers. So far, so good. But the food was brought to us on diesel trucks, and it was cooked on stoves that burn natural gas. Our lunch was ok raw at the farm gate, but as we ate it, on biodegradable paper plates shipped a thousand miles to us on trucks, it was not sustainable.

I went home to the garden in my back yard. I provide the labor myself, it's fertilized with compost that I make myself, and the trip from field to table is about 30 yards. But the garden must be irrigated, with water lifted by electric pumps. So my garden would be sustainable if we could get along on half of our water. The other half is unsustainable.

By now you get the pattern. Almost everything in our lives is unsustainable, from the food we eat to the water we drink to the transport, clothing, and materials we rely on. Is anything sustainable?

Behind my garden I have a large blackberry patch. The blackberries thrive without fertilizer and without irrigation. They produce only in the summer, but they are delicious, and they are truly sustainable.

Unfortunately my family can't live on berries, and neither can you.

What can we do? If you think about it, none of the figures or reasoning so far is the slightest bit controversial. Everyone who gives it a little thought will come to the same conclusions. But some of our practices are more nearly sustainable than others. The bicycle is a lot closer than the car, for instance. If we could live on half of our electric power, we'd be ok today for electricity. Europeans live as well as we do on half the energy per person.

Renewable sources such as wind and solar are steps in the right direction, but the numbers don't add up. They're small steps, because it takes a lot more capital (in other words, fossil fuel) to produce wind turbines or solar cells than it takes for gas turbine generators. So renewable electric power will always be more expensive and in shorter supply than the power to which we've become accustomed.

What about biofuels? Here the story is even worse. We are devoting

about 16% of our corn crop to producing 3% of our fuel as ethanol. You would think that at least we would be reducing our gasoline use by 3%, but it hasn't changed in the slightest. It takes as much fossil fuel energy to produce the ethanol as we get from burning it. This is why the big oil corporations aren't fighting ethanol. Used cooking oil can fuel only the tiniest fraction of our trucks. Other biofuels can be a little better, but not much, so we can't expect much from there. Biofuels, in short, are an illusion. Unsustainable. We would be better off burning our corn to produce electricity, displacing the coal and natural gas we use now; at least we would save the energy needed to distill it into ethanol. The very idea seems preposterous, and it is.

In general, the 'developed' world might better be termed the 'unsustainable' world. The United States, for instance, with 4% of the world's people, consumes about a quarter of its oil. Some of that oil is re-exported as the fuel used to produce grain, but the amount of that export is reduced by the penchant for producing ethanol in a futile attempt to increase our fuel supply. The rich countries use resources at an unsustainable rate, while the poorest hardly use unrenovable resources at all. The subsistence farmers of Africa, Asia or South America might hardly notice if the 'developed' world collapsed from resource exhaustion. If those regions can halt their population growth, they can live sustainably at about the level they live now, perhaps better. The present imbalance between the world's rich and the world's very poor is a social, economic and ecological time bomb.

In the long run, then, the world is in for a rough ride. Instead of living from the accumulated oil and gas that the environment has stored up for us over hundreds of millions of years, we will have to make do with what nature can provide right now. That will require some serious belt-tightening, as we learn to live with a fraction of the resources that we now take for granted. The question isn't whether this will happen, but when, and how abruptly. We can take the steps that the Earth Summit recommended, such as installing as much wind and solar power capacity as we can before we run out of the cheap fuel needed to build it. We can try to live lightly on the earth, though we can't live sustainably in anything like our present numbers or our present lifestyle. Too many of us living lightly on the earth will still destroy it.

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ABOUT THE AUTHOR

Professional summary (from the [Bruce Bridgeman web site](#))

"My research centers on spatial orientation by vision and perception/action interactions, while my intellectual interests also include the functions and neural basis of consciousness and the application of evolutionary theory to psychology. Over 100 articles in peer-reviewed journals and several book chapters cover the first two areas, while my book *Psychology and Evolution: The Origins of Mind* (Sage Press, 2003) is my attempt to jack up psychology and insert a theory underneath it."

As Professor Bridgeman's professional accomplishments are rather extensive, the reader is encouraged to visit his web site for further details.

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*"It is not by muscle, speed, or physical dexterity
that great things are achieved,
but by reflection, force of character, and judgement."*

Cicero (106-43 BCE)

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