

How Not to Kill Most Life on This Planet: an introduction to Radical Sustainability.

By A. C. Keefer

*Dedicated to my mother,
for her indispensable advice and enthusiastic support.*

Q: Before we get started, why do we even need a new kind of sustainability in the first place? What's wrong with sustainability as we know it today?

A: Right off the bat it should be cleared up that *Radical Sustainability* isn't new at all; it's just getting back to the real meaning of sustainability. At this point in time relatively few people know what sustainability actually means. What most of us are familiar with is what should really be called *Liberal Sustainability*. Like liberal politics, Liberal Sustainability tries to find just solutions to problems, but can only act in *reformist* ways, meaning within the limits of the status quo or “business as usual,” through established (often bureaucratic) channels. Because the status quo is arranged defensively to combat the possibility of significant change, reform can only be in a sense cosmetic, like pruning the branches of a tree, whereas a *radical* activity would be going for the tree's *roots*.

As such reform can change the less important details of something, but not its essential character. Liberal Sustainability just isn't cutting it: it's not making things better in any fundamental way, so our environment is still being devastated.

Q: But doesn't "radical" mean violent and extreme?

A: No. Radical comes from the Latin *radix*, literally meaning "of or to the root," or "base." We get the word “radish” from the same root. As such Radical Sustainability stands in contrast to Liberal Sustainability, with the latter's constant and overriding compromises. Radical Sustainability is, instead, sustainable to the very core. Ultimately it's the only true sustainability there is.

Q: Ok, so how do you define Radical Sustainability?

A: An activity is sustainable when it doesn't deplete or harm its environment in such a way that would make that activity impossible to continue. Sustainable activities can continue for as long as their environments remain and don't change or disappear for other reasons.

To be more specific, a sustainable activity replaces, to the greatest degree possible, everything it uses with material that's just as good or better than what it took, according to how surrounding animals, insects, etc. can make use of the byproduct. If what's given back is severely depleted, toxic or harmful to surrounding organisms, then that activity is not sustainable.

Most people are familiar with the concept of non-renewable resources, and are aware that an activity dependent on the use of such resources (a *depletive* activity) will eventually become unworkable.

Most depletive activities are also *destructive* activities, however; burning fossil fuels depletes that resource, but also pollutes and harms the environment. If a destructive activity continues for long enough, it will effectively obliterate the environment surrounding it, and all of the life forms that depended on that environment, stopping that activity just as effectively as if the original needed resource had simply run out. Any human activity, then, stops being sustainable when it becomes more depletive *or* destructive than the surrounding ecosystem can afford.

Any and all environmental damage eventually comes back around, affecting those who started the damage as well as those who did not, because everything in nature is ultimately connected. Because of this connectedness, the loss of habitat, or a specific environment, anywhere, also harms habitats everywhere. This understanding undoubtedly motivated the saying attributed to Chief Seattle, paraphrased here, that “humanity did not weave the web of life, humanity is merely a strand in it. Whatever humans do to the web, they do to themselves.”

Whether an activity is more depletive/destructive or less so *doesn't necessarily determine its sustainability*, since for all practical intents and purposes we live in a finite world. Simple logic dictates that *reducing* the exhaustiveness or destructiveness of an activity usually only prolongs the inevitable exhaustion or destruction; this reformist alteration won't necessarily make the action sustainable at all.

Thus, use of the now common phrase “more sustainable” can in this light be seen as akin to labeling a violently abusive relationship that leaves no visible bruises “more loving.” Such wording is completely inappropriate, obscuring reality with its optimistic guise. What the liberal phrase “more sustainable” really means is “more slowly destructive.” Honesty, and thus Radical Sustainability, dictates that the latter description should be the more commonly used one.

While Liberal Sustainability takes certain practices and technologies as given, as fixed constants, and as such confidently asks “*how* do we make this specific practice/technology sustainable?” Radical Sustainability first asks “*can* this specific practice/technology *be* sustainable?” Clearly, if the answer to this more basic question is “no” then we needn't waste our time searching for just the right “*how*,” since in actuality there *isn't one*.

To determine if a practice, technology, or more broadly a *system* is or can be sustainable, we have to look at it holistically (all of its parts and their relationships) and fundamentally (its main purpose and function).

A good general guideline to remember is that *any human system characterized mostly by consumption is not and can never be sustainable*.

Thus, for example, the problem with our systems of motor vehicle usage might not simply be one of *which fuel or power source is to be used*, but rather, and more fundamentally, *the very fact that it's a system based on rampant consumption*, pure and simple.

Another practical insight is that *any technology significantly different from what local, traditional indigenous societies have used for long periods of time is not likely to be sustainable*.

Q: So what's an example of an activity we use today that might not be sustainable, and its sustainable replacement?

A: We'll take using an electric heater for warmth as an example.

First we will look at the heater holistically.

The production of that heater requires both metals and plastics. All industrial metal mining is extremely destructive, and generally speaking metals are a nonrenewable resource.

The metals that we use are refined from *ore*, or rock that has usable minerals or metals in it. The material byproducts of the ore separation process, known as *tailings*, which are found near mines, often contain “arsenic, . . . barite, calcite, fluorite, radioactive materials, . . . sulfur (and sulfide compounds), cadmium, zinc, lead, manganese,” etc. Many of these things are toxic, caustic or otherwise harmful. [1] In addition, sulfuric acid is created when certain of the above mentioned materials oxidize in the waters of nearby streams, thus wiping out all life in the effected sections, which can be many miles long. [1]

Use of the notoriously lethal substance cyanide is also increasingly necessary for the separation of gold and other metals from ore. Mines commonly utilize a number of other toxic substances in this process as well, including sodium ethyl xanthate, which easily forms a dangerous gas that is readily absorbed through the skin, or potassium amyl xanthate, which is deadly to certain fish, or, yet again, even more sulfuric acid, simply adding to that which already forms in streams because of nearby mines. [1]

The “ponds” constructed to store most cyanide laced and otherwise contaminated wet mine tailings are prone to constant leaking and catastrophic failure. As such, small streams, huge rivers, underground water sources, animals, and the people that depend on all these things continually suffer the ravages of mine-related disasters.

Even if such “accidental” disasters were completely preventable, the disaster of intentionally tearing up huge patches of the earth, often sites sacred or otherwise important to local indigenous peoples, would remain a necessary precondition.

As was stated before, this heater, in addition to metals, also requires plastics to manufacture.

Plastics are made with, among other things, petroleum, which is nonrenewable and immensely harmful to extract and refine. One of the most common plastics that we encounter is polyvinyl chloride, or PVC, which in our heater is, at the very least, likely used as the insulation for its wires.

The production of PVC (and most all plastic or chemical production) creates *dioxins*, and after production more dioxins leach out of the PVC that surrounds us. This is a *very* bad thing because dioxins, as a class of chemicals, are some of the most hazardous and deadly substances known, “dangerous at doses of several parts per trillion.” In addition to being “highly carcinogenic and poisonous,” dioxins also alter the function and structure of living cells in disastrous ways. Once accumulated, (either directly through the environment or by consuming the flesh of a contaminated organism) dioxins stay active in human bodies for between four and twenty years. [1]

This heater likely also contains one of several flame retardant chemicals called poly-brominated diphenyl ethers (PBDEs), which are also found in numerous other appliances, products like carpet and paint, and which help give cars their “new car smell.” [1] In addition to liver and thyroid toxicity, exposure to PBDEs has been proven to cause problems in reproductive organs and with memory loss.

A veritable laundry list of health problems caused by exposure to various other plastics could be

drawn up, but a complete one would be too long for this brief Q & A. This list would, however, include *cancer, birth defects, chronic bronchitis, ulcers, skin diseases, deafness, and blindness*, to name just a few. [2]

In addition to the electricity that was necessarily used in the production of the heater, we obviously must use continuously more electricity for it to actually work.

The energy used to power this heater might come from dams, which destroy rivers and streams, making life impossible for those animals and humans who rely on them. Dams also surprisingly enough produce large amounts of greenhouse gasses (sometimes more than fossil-fuel burning energy plants). [3] This power might also come from coal plants with their smog, immensely destructive coalmines and related dangerous working conditions, or from nuclear reactors that produce wastes that remain toxic to humans for thousands or millions of years, which nobody has any idea how to contain securely.

Now, thanks to Liberal Sustainability, that energy increasingly might also come from one or another so-called "green" sources like wind turbines, made of metals and plastics, or solar panels, the production of which generally releases "... fluorine, chlorine, nitrate, isopropanol, SO₂, CO₂, respirable silica particles and solvents... Fluorine and chlorine are also emitted to the water ... [which] contribute to human toxicity, as does nitrate, which stems from neutralizing acids used in etching and texturing..." [4]

Even *if* there were some magical 100% clean way of generating energy, it must be remembered that the existing power lines used to carry that clean electricity to our heater are mostly aluminum, which is produced from bauxite ore, the mining and refining of which is, as was mentioned earlier, massively destructive. Production of the other common appliances that we would in turn run with this magical "clean" energy, such as light bulbs, refrigerators, TVs, etc., must also be accounted for. All of this supporting activity and infrastructure is, as we have seen, anything but "clean."

At the end of that heater's span of usefulness it will likely be taken to a mountainous dump or landfill that continually leaches toxic chemicals into the water supply of nearby communities (usually comprised of marginalized populations, i.e., people of color, impoverished people etc.) and periodically releases dangerous, flammable greenhouse gasses like methane. The heater could also end up burning in an incinerator, releasing into the atmosphere, amongst other things, the dioxins that are bound up in its plastic.

Otherwise it might contribute to one of seven gargantuan "garbage patches," vast areas of the ocean surface clogged by industrially produced garbage, one of which currently approaches the size of Africa. [1]

But the garbage doesn't stop at the surface; there is fully six times as much plastic as there is phytoplankton in the heart of the Pacific ocean, and it can be found at any depth. All of this garbage kills vast amounts of sea life by any number of methods, including by strangulation, asphyxiation, tangled immobilization, through starvation by filling a creature's stomach, by blocking intestinal tracts, etc. [1]

Recycling won't help this last part of the equation much either, as this is just yet another industrial process requiring the input of large amounts of energy and synthetically produced, non-renewable, toxic chemicals. Simple physics also dictates that in an energy intensive activity like

recycling you will not recover all of the solid material that you put in, it's an imperfect process that still at some point ultimately leads to a complete loss of usable material.

At its base the electric heater's *entire purpose and function* is the consumption of unnatural amounts of resources and energy. When we're done using the heater what's given back is *worse* than useless according to our environment. Of course the lessons that we can learn from this one small device are widely applicable, the industrial processes' described being similar for most mass-produced products.

None of this is sustainable. *None* of this *can be* sustainable.

A sustainable replacement activity in many locations would be, and has been, burning wood for heat.

Q: So everyone in my town should start burning fires all the time and that would be sustainable?

A: No, not at this time anyway. Most towns and all cities currently have populations so large that doing this would decimate what woody habitats might exist nearby.

The issue of how population relates to sustainability is a complex one. Within the context of how society is currently structured population is not the primary cause of environmental destruction. The amount of resources that wealthier, more highly industrialized economies regularly consume and how they consume them is by far a more serious contributor to our current problems than simple overpopulation.

However, the energy-intensive agricultural systems that now support truly massive numbers of people worldwide cannot last much longer. When food and energy systems necessarily scale down, de-industrialize and re-localize, the continued maintenance of large populations will become impossible. Local, truly sustainable resources (like firewood or wild foods like deer and salmon) are always more limited than temporarily abundant but non-renewable resources like petroleum.

In the Americas, it's likely that many indigenous groups had found and in many cases steadily maintained population numbers appropriate to their specific areas by the time of European conquest. It's unlikely that populations very much larger than those just mentioned can be maintained in the long run by people living truly sustainable lifestyles.

Let's be clear, mass murder or forced sterilization are *not* the answers to this issue. Communities must be empowered to re-learn the natural contraceptive techniques that people living in sync with their environments have known about and voluntarily practiced for thousands of years when reaching and maintaining harmonious, balanced and sustainable populations.

Of course it would also be *wildly* inappropriate after centuries of genocide to suggest that certain populations, for example indigenous peoples, should be expected to voluntarily decrease, or even just maintain their current numbers.

In any case it will be wise for us to remember that some activities are *never* sustainable, and all activities stop being sustainable *if too many people do them, too often.*

Of course this scenario of every individual household in a town or city switching to burning wood for heat (or individually practicing any other sustainable activity) would not really be the best *first step* towards overall sustainability for another big reason. *Individual household* consumption and pollution, even in wealthier, more highly industrialized societies, is *just not* what causes the most environmental harm.

Despite what public education campaigns focusing on the importance of shorter shower times and fixing leaky faucets might cause us to believe, the amount of water used by households today, for example, represents only about 5 percent of total world usage, with the rest mostly going to industry and agriculture. Municipal waste only makes up a tiny fraction, around 3 percent, of the overall amount of waste produced globally. Resource extraction is also often disproportionately driven by the extravagant demands of the military, prison, and other non-civilian industrial complexes.

The industrial economy is radically non-sustainable, that is, if we were to (ironically enough) picture the whole thing as a tree, it would be non-sustainable all the way through the trunk (manufacturing, mass transportation) down to its roots (raw resource extraction like mining or clear-cut logging).

The problem isn't at all one of needing to buy some energy efficient "green" heater. But it's also not primarily whether we as individuals might buy an electric heater at all, because the *individual* decision *not to* won't in actuality help the environment all that much. The problem is rather that there's an infrastructure in place that manufactures things like the electric heater, and that most people wouldn't know how to stay warm without one.

Purchasing decisions that we make on an individual basis mostly take place way out at the ends of the branches, around the leaves of this imaginary industrial tree. That position we have *as consumers* is not an efficient or particularly effective one for making substantial changes. Radical problems can really only be fixed with radical solutions, or once again, those that go to the root.

Q: So is any industrial technology sustainable?

A: No.

Q: That's ridiculous! Look at how long industrial society has been around, and we're not doing all that bad, all things considered, right?

A: Wrong. Such widely recognized and regarded sources as the American Museum of Natural History and the United Nations agree that "we are in the midst of a mass extinction of living things, and that this dramatic loss of species poses a *major threat to human existence* in the next century" (emphasis added). [5]

To be more specific: "we are in the middle of a sixth major mass extinction... The last great extinction event occurred at the end of the Cretaceous period, about 65 million years ago, when an estimated two-thirds of all species, including all the dinosaur groups except the birds, were obliterated." [6]

We have manufactured a comparable extinction event. Raven states "over the next few decades, we could lose about 50,000 species per year, a rate 20,000 times the [average natural] rate. By the year 2100, perhaps *two-thirds of the Earth's current species will have disappeared or be on the way to extinction.*" (emphasis added) [7] Eldridge continues; "perhaps three species an hour, nearly

30,000 species a year, are currently being lost." [8]

Considering what we now know about how life systems work on this planet, that is, how tightly interwoven and connected they are, it is very unlikely that *Homo Sapiens Sapiens* (modern humans) will survive such an extreme downsizing of biodiversity on this planet.

Furthermore, in this latest stage of what is now called the Holocene extinction event (named for the geological period of time we are now in), the activities of industrial, "civilized" humans are solidly to blame. The industrial economy has been around for less than 1% of the time that humans have existed, and in that short period it's already facilitated our delivery into this sorry state of affairs.

Q: So how long do we have before there are too few species left on this planet to support our survival?

A: Unfortunately, nobody really knows what the exact amount of biodiversity or number of species needed for human survival on this planet really is. The extreme complexity of this question means that not much serious research has been devoted to the topic. No one is even exactly sure how many species exist today, though "one UN-backed study estimated 5-30 million [exist, while] about 2 million [have been] documented so far. The UN Convention on Biological Diversity estimates they may be vanishing faster than they are found." [9]

While many take this uncertainty regarding the precise extent of extinction as a free pass to continue destroying the environment and its inhabitants, exactly the opposite attitude makes significantly more sense.

Considering the weight of the issue, concerning nothing less than our *own existence*, to say nothing of the *millions* of other species at stake, it seems an unreasonably bad idea to gamble. It is best to err on the side of caution in this instance and assume that the very next species to go extinct could be the straw that "breaks the camel's back," so to speak, *bringing about our own demise*. In all honesty no one can say for sure that that this is not, in fact, the case.

Our field of play has been drastically narrowed: we cannot afford to allow ourselves the luxury of making more mistakes. We need to stop the industrial economy and start transitioning to radically sustainable practices right now.

Q: Where can examples of radically sustainable living be found?

A: Right where you are! Look to the contemporary or historical practices of the traditional indigenous peoples who live now, or had lived, for long periods of time in your area.**

That so many indigenous groups have acted completely sustainably (at least before encountering overwhelming foreign negative influence and disruption) is no mistake or the product of ignorance. That is, this sustainability cannot be attributed to a "lack of enterprise or creativity" or "inability to innovate," but rather is the result of a cultivated, intimate awareness and of and reverence for ecosystems, and of deliberate vigilance against excessive waste and environmental harm.

Find out also if at any point indigenous and non-indigenous peoples forged decent relationships

and respectful lifestyles with one another (though it can't be said to have happened very often) and let the activities practiced by that alliance inform your decisions.

For example, based on estimated indigenous (Chinookan and Kalapuyan) populations in the late 1700s, there is no obvious reason to believe that anything above a population of around 30,000 humans can be sustained in the long term along the lower Columbia River, [10] or of around 2-10,000 through the Willamette Valley [11] where this Q & A was written.

Nor are there any compelling arguments that the main local diet of fast-food, bread, pasta, sweets, salad greens, farm meats and a few vegetables is sustainable in comparison or superior in any way to one of camas, wapato, hazel nuts, berries, acorns, tarweed seeds, wild birds and small mammals, salmon, black-tailed and white-tailed deer, elk, black bear, lampreys and even toasted grasshoppers and caterpillars. [10,11]

There are no solid reasons why we shouldn't build the walls of our houses with cedar planks and bark instead of with particleboard and plaster, or why we can't use candlelight instead of fluorescent bulbs.

Q: But most of the animals that were hunted where I live are gone now, and the local bodies of water that indigenous peoples drank from are now polluted. Surely these old ways won't work in all situations... Are we just supposed to starve?

A: Surely not! Obviously some problems we face will require nothing less than new and novel answers, and it is our responsibility to correctly identify and deal with these situations when we encounter them.

Of the more recent movements for sustainability that might help us out in these cases is *Permaculture*. This collection of design principles and techniques is useful for determining how to build nondestructive, easy to maintain food systems. These Permaculture 'forest gardens' can help us deal with smaller, rarer opportunities for hunting, gathering and foraging that a polluted, over-harvested and over-populated environment present. At least, that is, until environmental health and balance has been restored to a degree that would make more traditional lifestyles possible. Permaculture also suggests, for example, many ways to capture and store clean water, and how to build structures out of various sustainable resources that are abundant at this time.

Q: So is it sustainable to use the junk that industry once produced that will someday just be lying around?

A: As long as using it won't produce more pollution than not, and as long as we understand that someday it will break or wear out: all metals eventually corrode; all plastics eventually weaken and break, etc. Furthermore, these industrially produced items won't be replaceable once they are worn out. That having been said, reusing and scavenging already manufactured things will likely be a widespread and sensible activity in any post-industrial future.

It would be extravagantly wasteful, for example, to tear down every structure made with industrial materials in order to make way for new wood-built homes and buildings. Retrofitting perfectly usable existing structures for comfortable non-industrial living by adding things like wood stoves, extra insulation and rain-collecting containers will save both unnecessary work and precious resources. With regular maintenance some of today's modern buildings will last for

decades before necessarily giving way to more traditional ones. The same can be said for other things, such as some basic metal tools, as well.

Q: This is all just an awful lot to handle. Didn't Stone Age and indigenous people in many parts of the world develop more and more technology so they could advance to civilization because their radically sustainable lifestyles were boring, hard, and dangerous? Isn't Radical Sustainability just way too extreme? Will people ever willingly adopt Radical Sustainability ?

A: Whoa there- let's take those one at a time.

1) Most indigenous peoples who became "civilized" (in the European sense of the term) throughout history were coerced or else physically forced into doing so. Indigenous peoples and nations the world over have fought and died rather than be gobbled up by "advanced" imperialistic or expansive civilizations, and many indigenous peoples and nations continue to struggle for their own autonomy and self-determination, including the right *not* to "develop" their "natural resources" or industrialize. Many Westerners who have had the experience of living within so-called "primitive" societies often defend and in fact prefer these living arrangements. Those lifestyles that are radically sustainable must not necessarily be *all* bad then.

Countless numbers have felt various radically sustainable lifestyles to be deeply satisfying in fact, more so than living in any non-sustainable, consumerist culture. Plenty has also been written about the numerous and profound physical health benefits of living in traditional, non-industrial ways. What's more, many today happen to think that working all their lives at a job that kills the environment and doesn't adequately compensate them because their bosses are unjustly making a profit off their work is "*boring, hard, and dangerous.*"

2) Living sustainably with nature by resuming tried and true lifestyles seems like the most reasonable and moderate thing anyone could do, far more so than *killing most of the species on the planet*, including humanity. Perhaps this latter destructive course instead is "*just way too extreme.*"

3) It is unknown if most people accustomed to living in highly consumptive civilizations will willingly adopt radically sustainable lifestyles. What's likely is that if any humans survive in the coming centuries it will be because their communities adopted these radically sustainable ways. What's certain is that becoming acquainted with and proficient in these lifestyles voluntarily now will be easier and more pleasant than being forced into them due to hard circumstances later.

Rather than avoiding the topic entirely, perhaps a *limited, temporary* use for Liberal Sustainability should now be suggested: in lessening the destructiveness of those who are *completely* unable to comprehend and adopt radically sustainable lifestyles, while any such people are to be found. To influence those who can do no more to make simple concessions like reducing carbon emissions, to recycle, etc., is an admittedly useful task, in that some limited but real environmental benefits do accrue from it.

Caution must be used, though; in making sure that not too much of our precious time is devoted to such compromises, *as is now the case*. It would be utterly unforgivable to continue to allow those who are mentally more flexible or youthful, who are capable of grasping these concepts, to go uneducated in Radical Sustainability because we were simply "too busy elsewhere."

To reach any and all youth before they are indoctrinated by Liberal Sustainability and inducted into the fundamentally unquestioning consciousness of liberalism in general is a task of the *utmost* importance. If such a thing as a birthright exists, the practical knowledge that allows us to live a

healthy, beneficial life certainly qualifies as such. There's simply no reason to continue depriving future generations of this vitally important information.

Ultimately though, we must remember that even if fairly large numbers of people adopt truly sustainable lifestyles, this alone *will not necessarily stop* the environmental destruction that is making life impossible for so many species, including us. In general the industrial complexes that cause the most environmental damage would almost certainly take proactive steps to ensure that they can continue existing regardless of whether or not certain portions of the population are economically supporting them. They will likely take steps to undercut the ability of really large communities to become self-sufficient in order to ensure some level of continued economic support.

Thus again the issue is not so much one of individuals making quantitative personal changes despite the larger industrial economy, but rather one of qualitative societal change that necessarily includes confronting the industrial economy.

Q: So what is the best way to actually build towards a radically sustainable society?

A: The main focus of this piece is to explore the existence of and need for Radical Sustainability. Those discussions about how best to actually make the transition to Radical Sustainability are crucial ones that need to be brought up and debated more and more publicly. Hopefully pieces like this one will help to catalyze that interactive process.

Q: Still, even if we do somehow manage to live sustainably, won't it be extremely difficult constantly trying to resist our natural urge to destroy the environment?

A: While all highly consumptive societies teach us that the best we can hope for with regards to environmental responsibility is to resist our natural tendency to destroy, to just leave things alone as best as we can, in truth we as humans have evolved as *yet another integral product of nature* - not as its enemy.

Many non-industrial peoples, like all other successful life forms on this planet, actually benefit and have benefited the natural world by their daily activities. Acting sustainably hasn't always been an unusually difficult effort, and it doesn't have to be for any of us, not if we actively take responsibility and choose to live in a conscientious fashion, with reverence for the world around us.

Admittedly, those of us who are currently industrialized have a *very* thorough reversal of tendencies to go through before our actions can be *at all* beneficial. If industrial civilizations and economies are *completely* replaced with healthy communities and traditions, however, it will be possible.

Unlike some unlucky developments in evolution, we have proven that we have the power to choose the fate of our species. Our collective activities are based to a large degree on decisions; they are not completely biologically determined. However, not everyone in the species is in agreement on this point.

The immensely destructive decisions of a few (and the following of those decisions by the many) are quickly bringing severe repercussions onto all.

It might not be too late for those of us, who, depending on our circumstances, are willing either to change or stand by our traditional ways, to decide just which path humanity will ultimately take. Let's not squander what genuine opportunity we might have by following false road signs down a bad path, one that really only leads to *extinction*.

* In addition, "...Silica particles can be released in the mining and refining stage [which] may cause the lung disease silicosis. Emissions of solvents and alcohols [also] contribute to photochemical ozone formation and both direct (the solvents itself) and indirect (ozone) respiratory problems."

** It's true, as some hasten to point out, that not every indigenous society has acted sustainably. While much of the "evidence" used to support this point, like the "Pleistocene Overkill" hypothesis, is nonsense, and often leads cynics to go too far in condemning indigenous groups, care must still be taken to not exaggerate the truth or make an equally egregious mistake by claiming that indigenous societies were universally "perfect" in any respect. The fact that very few *or no* non-indigenous societies have ever definitively demonstrated their own sustainability, and that for the most part the *only* comprehensive, effective sustainability promoting worldviews are indigenous ones, however, causes this specific advice to remain sound.

References:

- [1] Jensen D, McBay A. What we leave behind. New York: Seven Stories Press; 2009.
- [2] Ecology Center. Adverse health effects of plastics [Internet]. 2001 [cited May 28th 2009]. Available from "<http://www.ecologycenter.org/factsheets/plastichealtheffects.html>"
- [3] Graham-Rowe D. Hydroelectric power's dirty secret revealed [Internet]. 2005 [cited May 28, 2009]. Available from "<http://74.125.155.132/search?q=cache:kqaj15NqQ38J:www.newscientist.com/article/dn7046-hydroelectric-powers-dirty-secret-revealed.html+dams+produce+greenhouse+gases&cd=1&hl=en&ct=clnk&gl=us&client=safari>"
- [4] Phylipsen GJM, Alsema EA. 2007 [cited December 21, 2008]. Summary 'Environmental life-cycle assessment of multicrystalline silicon solar cell modules' [Internet]. Available from "<http://www.chem.uu.nl/nws/www/publica/95057.htm>" Report number 95057.
- [5] The American museum of natural history & Harris L & Associates, Inc. Biodiversity in the next millennium [internet]. 1998 [cited January 20, 2009]. Available from "<http://www.amnh.org/museum/press/feature/biofact.html>"
- [6] Michael JN, editor. The biodiversity crisis: an American museum of natural history book. New York: The New Press; 2001.
- [7] Raven H. What have we lost, what are we losing? In: Michael JN, editor. The biodiversity crisis: an American museum of natural history book. New York: The New Press; 2001. Pp.62.

[8] Miles E. Evolution, extinction, humanity's place in nature. In: Michael JN, editor. The biodiversity crisis: an American museum of natural history book. New York: The New Press; 2001. Pp. 80.

[9] Reuters. Measuring extinction, species by species [Internet]. 2008 [cited November 26, 2008]. Available from "http://economictimes.indiatimes.com/Earth/Flora__Fauna/Measuring_extinction_species_by_species/articleshow/3682286.cms"

[10] Rick R. Naked against the rain: The people of the lower Columbia River 1770-1830. Salt Lake City (UT): Publishers Press; 1999.

[11] Zenk HB. Kalapuyans. In: Wayne S, William CS, editors. Handbook of North American Indians. Vol. 7: Northwest Coast. Washington (DC): U.S. Government Printing Office; 1990. Pp. 551.

Additional references:

Smith A. Conquest: Sexual violence and American Indian genocide. Cambridge (MA): South End Press; 2005.

Because I ended up referencing essentially every source read specifically while working on this piece, and for the sake of saving space and paper, I have omitted what would have been a very redundant complete bibliography.

Other resources:

An excellent introduction to some essential skills and items for living a radically sustainable life is McBay A's Peak oil survival: Preparation for life after gridcrash.(and the related website:) "http://inthewake.org/"

Classes in permaculture design are available in most cities around the U.S. at this time. For help with locating such a class, see: "http://www.permaculture.net/courses/listings.html"

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