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(For anyone who still needs convincing. From a scientist and lawyer.)

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Skeptical about The Skeptical Environmentalist. (Book Review) Richard M. Fisher.  
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The Skeptical Environmentalist: Measuring the Real State of the World. By Bjorn Lomborg. Cambridge University Press, London, 2001. ISBN -52101-068-3. 496 pp. Hardcover, \$28.

Shortly before he died, astronomer and science popularizer Carl Sagan wrote a wonderful book called *The Demon-Haunted World: Science as a Candle in the Dark* (Sagan 1996). The book is both a personal odyssey of a distinguished scientist's twilight and a beacon of reason in a world awash with irrational beliefs and superstition. Among the most important gifts that Sagan bequeaths us in the book is his "baloney detection kit." The kit is a handyman's tool set for skeptical thinking, and includes instructions for recognizing fallacious or fraudulent arguments. Among the instructions:

- \* wherever possible obtain independent confirmation of the facts
- \* encourage substantive debate on the subject by knowledgeable persons
- \* spin more than one hypothesis
- \* ensure that every link in a chain of argument works, not just most of them

The baloney detection kit also includes extensive advice on what not to do. It is based upon fallacies of logic and rhetoric, some simple, others more complex. My personal favorite among them is misunderstanding the nature of statistics, with Sagan's example of President Dwight Eisenhower "expressing astonishment and alarm on discovering that fully half of all Americans have below average intelligence."

I had occasion to revisit Sagan's baloney detection kit in the context of reading *The Skeptical Environmentalist*, a book by Danish statistician Bjorn Lomborg. Lomborg's book has attracted remarkable negative comment from the scientific community, juxtaposed with positive gushes from the popular press. The *Washington Post* calls it "the most significant work on the environment since the appearance of its polar opposite, Rachel Carson's *Silent Spring*, in 1962" (Dutton 2001). Similar kudos are offered by *The Economist*. In contrast, there has been a plethora of negative reviews of the book in scientific journals, including the heavyweights *Nature*, which calls it "deeply flawed" (Pimm and Harvey 2001), and *Science*, which disapproves of Lomborg's selective use of data (Grubb 2001). Other negative reviews have appeared in more specialized science journals, such as *Environment* (Gleick 2001) and *World Watch* (Bell 2002). Among the most vociferous critics has been *Scientific American*, which countered with its own debunking article (Rennie 2002), including rebuttals by a coterie of scientific heavyweights, all of whom refute Lomborg's claims.

The gist of the scientific feedback against Lomborg is that he displays wilful ignorance, quotes selectively from the works of others, and, perhaps above all else, courts the attention of media that accept his work at face value, in an uncritical manner (Wilson 2001). The oddity is that the book, while claiming to be a skeptical review of a wide body of "doomsaying" environmental studies, should itself be subject to a healthy dose of skepticism. A reasonable layperson is likely to look askance at Lomborg's claims that virtually every environmental indicator is better than scientists claim, including world hunger, global warming, forest depletion, species extinction, loss of nonrenewables, acid rain, as well as water, air, and wastewater pollution. A reasonable person is also likely to view with marked disbelief Lomborg's claims that all that bad news is the result of a directed and concerted cabal of environmental pressure groups to conceal the truth. In a nutshell, the truth may be out there ... but not in his book.

How then do we explain the ability of someone who has admitted having no scientific training or expertise comparable to those he attacks to attract such favorable press? Canadian scientist David Suzuki

suggests that it is because Lomborg assuages guilt about ecological problems (Suzuki 2002). In contrast to current United Nations reports which paint a pretty dismal picture about the state of the environment, Lomborg tells us what we prefer to hear: namely that things are a lot better than pessimistic scientists would have us believe.

More important than all of this, from the SKEPTICAL INQUIRER's point of view; is finding the answer to Lomborg's success through his use of the toolkit advice offered in *Demon-Haunted World*. By that advice, I refer specifically to things Sagan warns us not to do. The *Skeptical Environmentalist* is a textbook example of the anti-science toolkit in action. As such, it is extremely illustrative. Here are some of those tools and how they have been (ab)used, chosen (due to length restrictions) from a single chapter in Lomborg's book which deals with biodiversity.

### Straw Man

According to Sagan, a straw man fallacy is "caricaturing a position to make it easier to attack." Lomborg uses a more subtle variation on this theme, by finding an early, erroneous or exaggerated scientific viewpoint, and then treating it as though it were still mainstream. In particular, he quotes from the work of a scientist who stated in 1979 that we could be losing something in the order of 40,000 species a year to human-driven extinction. To increase the caricature, Lomborg reprints the 40,000 species number on an X-Y graph so that the 40,000 figure spikes up like a sore thumb from a near-zero baseline from the years 1600-2000. Lomborg states that this "is a figure which with monotonous regularity has been repeated everywhere until in the end we all believed it." The problem is, it hasn't, and we don't (Lovejoy 2002). However, by emphasizing that 40,000 figure again and again, Lomborg tars with the same brush other, more current studies which still show an alarming loss in biodiversity over time.

In creating his straw man, Lomborg also engages another of the anti-science tools, observational selection. Sagan describes this as enumerating favorable circumstances by counting hits and avoiding misses. Lomborg refers to the 40,000 number repeatedly, without referring to the body of work of the scientist in question, carried out in eighty-plus published papers over the course of a twenty-year period (Myers 2001).

In *Demon-Haunted World*; Sagan talks frankly about himself, and other scientists, who occasionally get it wrong. The truth is, scientists make mistakes. Among those Sagan himself acknowledges was his belief that when Iraq torched Kuwaiti oil wells in 1991, the smoke might be enough to disrupt agriculture. While it did get dark at noon, and while Persian Gulf temperatures did drop several degrees, not enough smoke reached the stratosphere to cause serious long-term disruption. Sagan got it wrong (thank goodness).

Unfortunately, when a scientist is premature in making conclusions, or is simply wrong in the published literature, the paper stays around, bound somewhere on a library shelf, where it can be quoted many years later, as Lomborg has done. Never mind that there are more current figures: a past mistake may have been found, and thus the whole body of literature respecting biodiversity loss is suspect. This also illustrates two more of Sagan's anti-science tools: slippery slope, whereby letting even one, possibly exaggerated species-loss figure slide by without trashing the entire field may lead to complete chaos, and suppressed evidence, or half truths, wherein a claim that has been "caught out as poorly supported" is trumpeted with appropriate fanfare, at the same time as other claims in the same area are swept under the carpet, or given short shrift.

### Argument from Authority

In the context of Lomborg's book, arguing from authority means garnering support from leaders in the field, especially if their support for you can be given without revealing their own existing prejudice in favor of your point of view. The English language version of Lomborg's book includes a number of favorable comments by various researchers reprinted on the covers. Most noticeable of these is the praise of researcher Matt Ridley. The words "a brilliant and powerful book," appear in big, bold print on the front cover, above the book's title, being a quote from "Mart Ridley, author of *Genome*." Ridley is no slouch in the science field, and it would be tempting to conclude that his praise is high praise indeed from an

impartial genetics researcher. Unfortunately, what isn't stated anywhere in *The Skeptical Environmentalist* is that Ridley is also a past editor of *The Economist*, and is very much a believer that economic progress can go hand in hand with environmental improvement. This is in fact a very contentious view, and is opposed by many in the field of sustainable development. How do we know Ridley believes this? Because he says so himself, in a followup letter in support of Lomborg published in *Scientific American* (Ridley 2002). Ridley may be right in encouraging a stronger linkage between economic development and sustainability, but that's not the point. Many people will see his support on the cover of *The Skeptical Environmentalist*, but only as the author of a popular book on generics, and therefore out of context.

### Ad Hominem Attacks

Lomborg decries what he perceives to be a number of personal attacks on himself in the myriad reviews that conflict with his own point of view. That may be in part a misplaced perception on the part of anyone who is an inexperienced gladiator in the scientific arena. As Sagan points out in *Demon-Haunted World* scientists aren't there to be the friends of new theorists. They are there to test new views, to challenge them, to ensure that they are robust. However, Lomborg himself slips into the tactic of attacking the arguer, rather than the argument, when he states in his biodiversity chapter that the basis of opinion of biologists' arguments is that "there are many grants at stake."

### Inconsistency

An example of the inconsistency principle, described in *The Demon-Haunted World* is the belief that it is "reasonable for the Universe to continue to exist forever into the future, but judge absurd the possibility that it has infinite duration into the past." This is arguably the most oft-repeated complaint lodged against Lomborg's book. In addition to selective use of data, critics argue that Lomborg is inconsistent in his use of global or regional trends, and switches from one to the other where it pleases his argument. This produces interesting results when talking about percentages. Remember our "40,000 species a year" scientist? Lomborg is determined not to let him off the hook, and repeats this number several times in his biodiversity chapter. However, whenever Lomborg talks about the "true" state of biodiversity loss, he consistently expresses it as a percentage, or rate of loss. His reason for doing so is because that is the way biodiversity loss is measured these days. If so, however, why keep trotting out that old 40,000 species a year figure? Lomborg trumpets his own figure of 0.7 percent species loss per fifty years, with a sigh of relief.

Things aren't as bad as we have been told. But with his own acceptance of current species numbers, Lomborg's estimate would still amount to thousands of species lost every year. It just doesn't sound as bad when it's expressed as a rate of loss. This begs the question: should society be any less galvanized to take action against a biodiversity loss of several thousand, as opposed to scores of thousands of species annually? Apparently so, according to Lomborg, who considers that losing 0.7 percent of all species per fifty years is a lot rosier than 40,000 species a year. Thank goodness for percentages!

As you can see from the above analysis, people like Lomborg can get quite a bit of mileage debunking science. The anti-science tools I've mentioned are just a few in the larger collection Sagan sets out in *The Demon-Haunted World*. They can be quite fun to use, as a destructive exercise. Earlier in the last century for example, we could have had a good crack at Einstein, on the basis of his lousy school record, paucity of published papers, unexplained holes in his work, such as the existence of dark matter, and that unusual, funky hairdo. Anyone who uses *c* as a mnemonic for the velocity of light must be seriously unstuck.

On a more serious note, I wish I could conclude by saying that Lomborg's book has had some benefit to science, perhaps by way of emphasizing the need for robustness in modeling, or the need for critical evaluation of data. As it happens, those already are central tenets of scientific inquiry, as they have been throughout the history of environmental debate.

All that Lomborg has accomplished is to try, without much success, to expose the soft underbelly of science. That underbelly is the uncertainty that invariably accompanies the initial investigations of natural and physical phenomena. That's why the study of problems like global warming is so easy to attack. There is now general consensus that global warming is a genuine phenomenon, but the uncertainty among studies as to its scope and speed provide more than enough ammunition for those determined to seek weaknesses in the arguments, and thus dither away while the problem intensifies.

Unfortunately, the only groups that will be served by Lomborg's book will be the pro-development and anti-environmental lobbies. No doubt they've been clamoring for a "feel good" book like this, after all the bad news. I've already seen the book trotted out at globalization meetings hosted by private interest groups favoring free trade. In sum, I'd give Lomborg's book a pass. Go to the public library and check out *Demon-Haunted World* instead.

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Named Works: *The Skeptical Environmentalist: Measuring the Real State of the World* (Book)

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Check out our nifty Friends of Rothrock poster: <http://www.mccaughey.net/~sam/rothrock.html>

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